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Criterion III: - Research, Innovations and Extension

3.3 Research Publications and Awards

Sr No.	Title of paper	Name of Author	Name of journal	Link to website of the Journal	Link to article / paper / abstract of the article	Page No.
1	Geographic Multipath Routing based on Triangle Link Quality Metric with	Dr. V. R. Ghorpade	Journal of King Saud University - Computer and Information Sciences	https://www.sciencedirect.com/journal/journal-of-king-saud-university-computer-and-information-sciences/vol/33/issue/1	https://www.sciencedirect.com/science/article/pii/S1319157817303920	9

	Minimum Inter-path Interference for Wireless Multimedia Sensor Networks					
2	MQL Machining with Nano fluid – A Review	Mr.P. B. Patole	Journal of Manufacturing Review	https://mfr.edp-open.org/	https://mfr.edp-open.org/articles/mfreview/pdf/2021/01/mfreview200048.pdf	11
3	Health care system to built secure paitient record by using block chain and artificial intellegence	Dr. V. R. Ghorpade	International Journal of Advanced Science and Technology	http://sersc.org/journals/index.php/IJAST/index	http://sersc.org/journals/index.php/IJAST/article/view/6075	13
4	FEA modeling and prediction of surface roughness of aluminum alloy (LM4) during turning process	Mr.P.B.Patole	Manufacturing Technology Today	https://cmti.res.in/mtt-journal/#:~:text=Manufacturing%20Technology%20Today&text=MTT%20is%20indexed%20in%20Indian,3830.	http://www.i-scholar.in/index.php/MTT/article/view/207992	15
5	Solar Photovoltaic (PV) with STATCOM feature to improve Power Quality for distribution with MATLAB tool	Dr. R. K. Chougale	International Journal of Advanced Science & Technology (IJAST)	http://sersc.org/journals/index.php/ijast	http://sersc.org/journals/index.php/IJAST/article/view/5668	17
6	FEA modeling and prediction of surface roughness of aluminum	Mr.G.J. Pol	Manufacturing Technology Today	https://cmti.res.in/mtt-journal/#:~:text=Manufacturing%20Technology%20Today&text=MTT%20is%20index	http://www.i-scholar.in/index.php/MTT/article/view/207992	19

	alloy (LM4) during turning process			ed%20in%20Indian,3830.		
7	Internet of Things Enabled Fire Resilient Building Automation System using AI Approaches	Dr. V. R. Ghorpade	International Journal of Creative research thoughts	https://www.ijcrt.org/	https://www.ijcrt.org/papers/IJCRT2009176.pdf	21
8	A trust management model based on NSGA-II in mobile grid system	Dr. V. R. Ghorpade	International Journal of Knowledge-based and Intelligent Engineering Systems,	https://content.iospress.com/journals/international-journal-of-knowledge-based-and-intelligent-engineering-systems/26/2	https://content.iospress.com/articles/international-journal-of-knowledge-based-and-intelligent-engineering-systems/kes200045	23
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10	Classification and Severity Measurement of Epileptic Seizure Using Intracranial Electroenceph alogram (iEEG)	Mr. S. S. Pawar	International Journal of Innovative Technology and Exploring Engineering (IJITEE)	https://www.ijitee.org/download/volume-10-issue-2/	10.35940/ijitee.B8249.1210220	27
11	A Fuzzy Lattice System to Trust Management in Mobile Grid	Dr. V.R. Ghorpade	International Journal of Innovative Technology and Exploring Engineering	https://www.ijitee.org/download/volume-8-issue-10/	https://www.ijitee.org/wp-content/uploads/papers/v8i10/J95690881019.pdf	29

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13	Responsiveness of HEIs to industrial revolution 4.0	Dr. V.R. Ghorpade	International journal of advance and innovative research	https://iaraedu.com/	https://iaraedu.com/pdf/ijair-volume-6-issue-1-ix-january-march-2019.pdf	33
14	Convolutional Neural Networks for Leaf Image-Based Plant Disease Classification	Mr.S.B.Jadhav	Interntaional Journal of Artifictial Intelligence	https://ijai.iaescore.com/index.php/IJAI/article/view/20245	http://doi.org/10.11591/ijai.v8.i4.pp328-341	35
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16	Soybean leaf diseases detection and severity measurement using multiclass SVM KNN classifier	Mr.S.B.Jadhav	Interntaional Journal of Electrical and Computer Engineering	http://ijece.iaescore.com/index.php/IJECE/article/view/14919	http://doi.org/10.11591/ijece.v9i5.pp4077-4091	39
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24	GCM-AES-VR : A Scheme for Cloud Data Confidentiality and Authenticity	Dr. Vijay R. Ghorpade	International Journal of Computer Sciences and Engineering	https://www.ijcseonline.org/	10.26438/ijcse/v6i12.8694	55
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Geographic Multipath Routing based on Triangle Link Quality Metric with Minimum Inter-path Interference for Wireless Multimedia Sensor Networks

Shailendra Aswale [a,*], Vijay Ram Ghorpade [b]

[a] Department of Computer Science & Engineering, DYPCET, Shivaji University, Kolhapur, Maharashtra, India
[b] Department of Computer Science & Engineering, BVCOEK, Shivaji University, Kolhapur, Maharashtra, India

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ABSTRACT

Wireless Multimedia Sensor Networks (WMSNs) have emerged as the new class of wireless sensor networks (WSNs) to meet the stringent Quality of Service (QoS) requirements of emerging applications. Multipath routing with cross-layer approach appears to be a potential solution for supporting the distinct characteristics of WMSNs. However, due to the broadcast nature of the underlying medium, multiple paths are exposed to inter-path interference. In addition, low-power wireless links are asymmetric, error-prone and unreliable in nature. Consequently, an accurate and stable link quality estimation is essential to guarantee the performance of routing protocol. This paper proposes Triangle link quality metric and minimum inter-path Interference based Geographic Multipath Routing (TIGMR) protocol which finds multiple node-disjoint paths in IEEE 802.15.4 compliant network. This cross-layer routing protocol selects forwarding node based on a triangle link quality metric, remaining energy, and distance while anticipating minimum adjacent path interference effect. In addition, TIGMR protocol avoids Hidden Node Problem (HNP) at the sink node without using Request-To-Send/Clear-To-Send (RTS/CTS) handshake mechanism. Simulation results indicate TIGMR protocol optimizes overall performance and improves network lifetime as compared with state-of-the-art Two-Phase Geographic Forwarding (TPGF) and Link Quality and Energy-Aware Routing (LQEAR) protocols.

1. Introduction

The promising pace of technological research growth has led to the development of sensors capable of sensing and transmitting multimedia data along with scalar data. Wireless Multimedia Sensor Network (WMSN) is a paradigm for the next phase of evolution in Wireless Sensor Network (WSN). A WMSN is a network of interconnected heterogeneous wireless sensors that enables retrieval of video and audio streams, still images, as well as scalar sensor data. WMSN is an exciting new technology with huge potential for reinforcing the traditional WSN applications, as well as creating a series of new multimedia applications such as smart surveillance, visual target tracking, traffic monitoring, environmental monitoring, advance health care delivery, disaster management in Internet of Things (IoT) (Akyildiz et al., 2007, 2008; Al-Turjman, 2017; Alvi et al., 2015).

Quality of Service (QoS) is the ability to deliver a guaranteed level of service to potential applications. The main objective of WMSN is to deliver multimedia content with the predefined level of QoS. The transmission of multimedia data requires careful handling in order to ensure that there is a low packet loss rate, end-to-end delay remains within an acceptable range, and jitter is adequate for the perceived video quality. However, due to limited network resources, it is a challenging task to achieve the desired level of QoS for wide range of real-time multimedia applications in WMSN (Al-Turjman, 2018). In fact, multimedia data transmission with QoS guarantee in WMSNs depends on the design and implementation of routing protocol (Aswale and Ghorpade, 2015; Ehsan and Hamdaoui, 2012; Shen and Bai, 2016).

Over about a decade, several empirical studies are being carried out on characteristics of the low-power wireless links. The low-

* Corresponding author.
E-mail address: aswale.shailendra@gmail.com (S. Aswale).
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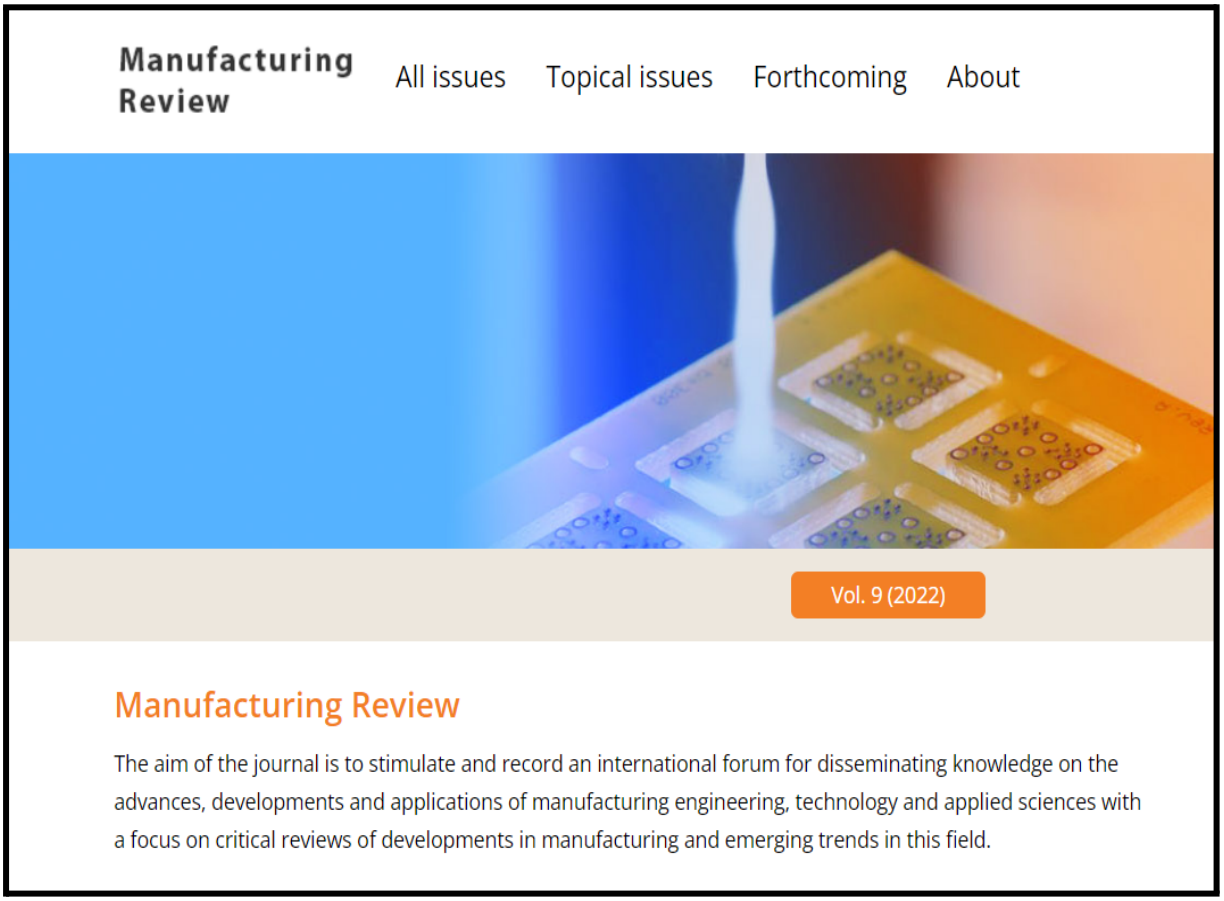
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REVIEW OPEN ACCESS

MQL Machining with nano fluid: a review

Pralhad B. Patole[1,*], Vivek V. Kulkarni[2], and Sudhir G. Bhatwadekar[2]

[1] Department of Mechanical Engineering Bharati Vidyapeeth's College of Engineering, Kolhapur, Maharashtra, India
[2] Department of Mechanical Engineering Sanjay Ghodawat Group of institution, Kolhapur, Maharashtra, India

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Abstract. In any metal cutting machining operation, the cutting fluid plays important role by cooling the cutting tool and the surface of the work piece, also chips are removed from heat affected zone. However, misuse of the cutting fluid and wrong methods of its disposal can affect human health and the environment badly. This paper presents a review of the important research papers published regarding the MQL-based application of mineral oils, vegetable oils and nano fluid-based cutting fluids for different machining processes, such as, drilling, turning, milling and grinding, etc. Most of the experimental studies have shown that application of MQL produces surface better than the flood and dry machining. In turning operation, parameters such as cutting speed, depth of cut, feed rate and tool nose radius have great impact on the surface finish. During high speed turning of steel inherently generates high cutting zone temperature. Such high temperature causes dimensional deviation and failure of cutting tools, surface and subsurface micro cracks, corrosion etc. Therefore, with proper selection of the MQL system and the cutting parameters, it is possible for MQL machining with minimum cost and less quantity of coolant to obtain better conditions, in terms of lubricity, tool life, cutting temperature and surface finish. The findings of this study show that MQL with nano fluid can substitute the flood lubrication for better surface finish.

Keywords: Minimum quantity lubrication / nano fluid / machining / surface roughness etc.

1 Introduction

In recent times, modern machining industries are trying to achieve high quality, dimensional accuracy, surface finish, high production rate and cost saving along with reduced environmental impact. In the machining process, one of the commonly carried out operations is a turning. It can be carried out on variety of machines like lathe, special purpose machine or CNC machine. The quality of turning is measured in terms of tolerances and roughness of surface. Surface finish is a quality specified by customer for machined parts [1]. There are many parameters that affect surface roughness, but most are difficult to quantify adequately. In turning operation, parameters such as cutting speed, depth of cut, feed rate and tool nose radius have great impact on the surface finish [2]. The turning operation seems very simple; through high speed turning of steel inherently generates high cutting zone temperature. Such high temperature causes dimensional deviation and premature failure of cutting tools. It also impairs the surface integrity of the product by inducing tensile residual stresses and surface and subsurface micro cracks in addition to rapid oxidation and corrosion [3].

A cooling lubricant is used in turning operation to reduce friction at tool chip and work piece interface. However, in high speed machining, conventional cutting fluid application fails to penetrate the chip tool interface and thus cannot remove heat effectively The lubricant has a strong effect on machined surface quality and tool wear. The costs related to cutting fluid represent a large amount of total machining cost; also cause health of machining operator and correct disposal [4]. However, at present complete elimination of cutting fluid is not possible. An alternative to conventional flood machining is the application of cutting fluids, in very small quantities to the small area where actual machining takes place. This technique is known as minimum quantity lubrication (MQL). In MQL the heat removal can be done and it also provides sufficient lubrication to prevent the generation of heat and reduces environmental impact [5].

The recent development of nano fluids provides alterative cutting fluids which can be used in MQL machining. The advanced heat transfer and tribological properties of nano fluids can provide better cooling and lubricating in the MQL machining process, and make it production-feasible.

*e-mail: pb.patole@rediffmail.com


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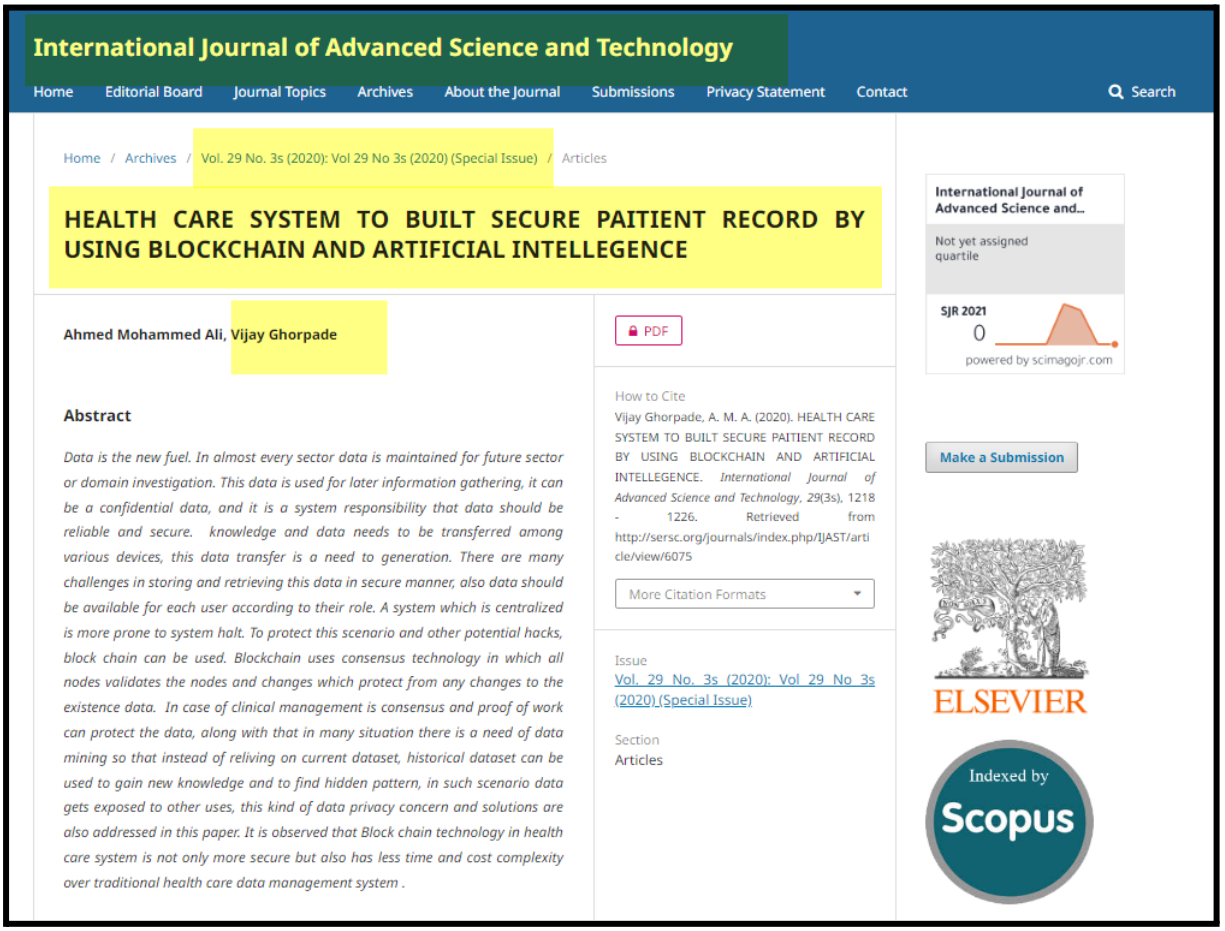

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HEALTH CARE SYSTEM TO BUILT SECURE PAITIENT RECORD BY USING BLOCKCHAIN AND ARTIFICIAL INTELLEGENCE

Ahmed Mohammed Ali, Vijay Ghorpade

Abstract

Data is the new fuel. In almost every sector data is maintained for future sector or domain investigation. This data is used for later information gathering, it can be a confidential data, and it is a system responsibility that data should be reliable and secure. knowledge and data needs to be transferred among various devices, this data transfer is a need to generation. There are many challenges in storing and retrieving this data in secure manner, also data should be available for each user according to their role. A system which is centralized is more prone to system halt. To protect this scenario and other potential hacks, block chain can be used. Blockchain uses consensus technology in which all nodes validates the nodes and changes which protect from any changes to the existence data. In case of clinical management is consensus and proof of work can protect the data, along with that in many situation there is a need of data mining so that instead of reliving on current dataset, historical dataset can be used to gain new knowledge and to find hidden pattern, in such scenario data gets exposed to other uses, this kind of data privacy concern and solutions are also addressed in this paper. It is observed that Block chain technology in health care system is not only more secure but also has less time and cost complexity over traditional health care data management system .

PDF

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FEA Modeling And Prediction Of Surface Roughness Of Aluminum Alloy (LM4) During Turning Process

P. B. Patole [1], S. G. Bhatwadekar [2], V. V. Kulkarni [2], G. J. Pol [1]

Affiliations

1 Bharati Vidyapeeth's College of Engineering, Kolhapur, Maharashtra, India

2 SGI Atigre, Kolhapur, Maharashtra, India

Different cutting parameters have different influences on the surface finish. A study of effect of some of these parameters on the surface roughness of Aluminum alloy grade LM4 (AlSi5Cu3) is carried out in this work. In the experiment conducted, six values of cutting speed, three values of depth of cut, six values of feed and two values of tool nose radius are used. The experimentation was carried out using a three factor experiment principle from design of experiment. The chemical composition of the work material was tested using arc spectrometer and verified to be of grade LM 4. The values of parameters like cutting speed, feed rate and depth of cut were selected from the recommended ranges from the tool manufacturer catalogue. The test pieces were turned on a center lathe machine under different levels of these parameters. The surface roughness of the machined surface was measured using surface measurement tester. From the analysis of results the relationship between surface roughness and equivalent stress is established.

Keywords

Turning, surface Roughness, Equivalent Stress, Cutting Parameters.


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SOLAR PHOTOVOLTAIC (PV) WITH STATCOM FEATURE TO IMPROVE POWER QUALITY FOR DISTRIBUTION WITH MATLAB TOOL

Chougale Rajkumar Kundlik, Dr. P. Karpagavalli

Abstract

This paper demonstrates grid associated solar photovoltaic (PV) system with reactive power control as a STATCOM called as PV Solar STATCOM. A MATLAB tool gives a specific idea about the real and reactive power flow to the power system. A voltage source inverter (VSI) actually provides both real as well as reactive power to the grid as per the load demands. A reactive power flow in an power system defines the Power Quality (PQ), therefore needs to compensate. This is possible by means of PV solar STATCOM which enhances the quality of power and minimizes harmonics. A non-linear load is the principle cause of harmonics, while the PV system establishes power converters which are enormously producing source of harmonics. In this paper, the harmonics are controlled by a photovoltaic system (PV) on a distribution side by utilizing STATCOM feature with the use of MATLAB tool, which further improves power factor and therefore power quality as well.


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INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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Internet of Things Enabled Fire Resilient Building Automation System Using Artificial Intelligence Approaches

[1]Prachi Surgounda Patil,[2]Anil R. Surve,[3]Vijay R. Ghorpade

[1] M. Tech Student, Dept. of Computer Science and Engineering, Walchand College of Engineering Sangli, India,
[2]Department of Computer Science and Engineering, Walchand College of Engineering, Sangli, India,
[3]Principal, Bharati Vidyapeeth's College of Engineering, Kolhapur, Maharashtra, India.
[1]Computer Science and Engineering,
[1]Walchand College of Engineering, Sangli, India

Abstract: In recent years, fire accidents mainly in buildings are considerably increasing around the world. The reasons being due to overheating of pots and pan, improper way of keeping portable heaters, smoking in bedrooms, electrical equipment, candles near to explosive or flammable materials, faulty wiring, congested construction of the building and even due to increasing the number of population as well as improper light fittings. Fire outbreak is the third biggest risk to smart cities in India. According to the Indian Risk Survey (IRS) in 2018, 7.24% of accidents occur due to fire outbreaks [1]. So the demand of automation system to detect fire and take appropriate actions such as giving alerts as well as taking immediate action to reduce the intensity of fire has become obvious. In this zest, mainly two approaches are experimented and explored here. Primarily fire detection using machine learning approaches is achieved and also rule-based approach is employed with other relevant parameters. Different machine learning approaches like Deep Learning Neural Network (DNN), AlexNet, VGG-16, LeNet-5, and ResNet-50 experimented for classification of images and detection of fire based on image dataset. Also for rule-based system input from context-aware sensor system were taken and adjudged the intensity of fire according to different rules so as to initiate appropriate actions.

Index Terms **- Machine Learning, Deep Learning, Internet of Things, Rule-based System, fire reorganization, context aware, fire disaster management, Building Automation System.**

I. Introduction

The Internet of Things plays a vital role in the development of nations because it provided with a unique identity to every object which helps to take proper actions without human interaction. In real-world of automation it is the most important technology. Depends upon data given by various sensors and context, it automatically takes action in real-time. The varied potential domains are mainly healthcare, transportation logistics, automated vehicles monitoring, smart payment systems such as banking, smart space, agriculture, wearable computing, construction, real estate and smart home [2] .

Smart building process aims to automatically control building operations. Instrumented sensors are enabled with IoT technologies to communicate and analyze data used to optimize building management systems. In the same zest, Smart home is the premier ranked application in Internet of Things by all channels. Smart home is basically aimed to help concerned people in their everyday activities. The different types of smart home application are Smart electricity meters, Smart home apps, and Smart parking in society buildings, automatic control of electrical appliances such as fans and lights, smart locks, recycling systems in home, security and protection in home [3].

Context-aware system is promising technological path of innovation which is integral part of Ubiquitous computing. It helps IoT to increase parameters and makes system more meaningful. According to system there are different contexts are present such as time, location, id, temperature, humidity, smoke and many more. A key objective of Context-awareness has significantly simplified in Human Computer Interaction (HCI) by deploying all possibilities of IoT devices such as sensors and actuators.

Machine learning is the subset of the Artificial Intelligence. It is a mathematical science that focuses on analyzing as well as interpreting of the patterns which are used for learning, dynamic decision making, reasoning outside of human interaction. ML is also used in various domains such as online fraud detection, product recommendation, social media services, video surveillance, predictions, classifications, object detection as well as Virtual Personal Assistants.

Recently, across the globe, fire accidents in buildings have become larger because lack of real time fire detection on the correct time and hence it has become necessary to build efficient fire management system in the design of smart cities. In the traditional systems, according to the intensity of fire, taking of appropriate actions dynamically is not available. Smart fire management system is important to minimize damage of life and property. Accurate and precise diagnosis of the intensity of fire has been a significant challenge.

The Machine learning object detection algorithm benefits to detect fire faster and in accurate manner. For detection of fire, the Deep Neural Network is promising which is an extension of the Convolution Neural Network. DNN mainly used for two purposes, first is for image classification and second is for object detection [4]. Rule based approach is mainly used to store and utilize knowledge or

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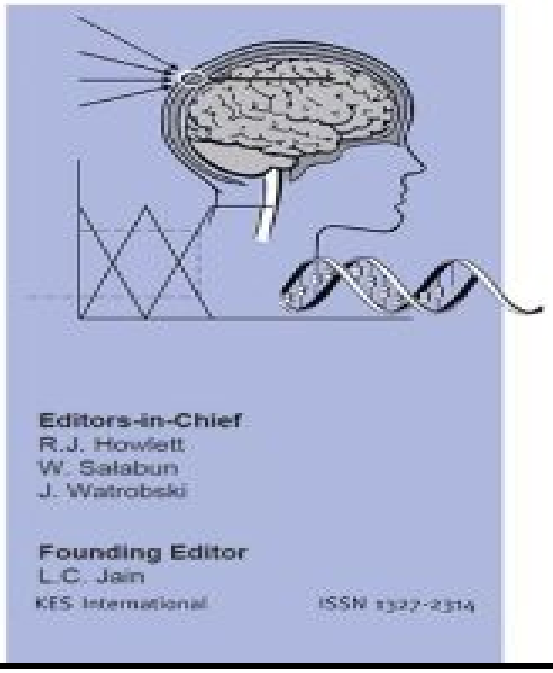

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A trust management model based on NSGA-II in mobile grid system

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Authors: Otari, Grantej Vinod[a;*] | Ghorpade, Vijay Ram[b]

Affiliations: [a] Department of Computer Science and Engineering, Shivaji University, Kolhapur, Maharashtra, India | [b] Department of Computer Science and Engineering, Bharati Vidyapeeth's College of Engineering, Kolhapur, Maharashtra, India

Correspondence: [*] Corresponding author: Grantej Vinod Otari, Department of Computer Science and Engineering, Shivaji University, K.I.T.'s College of Engineering, GokulShirgaon, Kolhapur, Maharashtra, 416234, India. Tel.: +91 9922401619/+91 9834661522; E-mail: Grantejv@gmail.com.

Abstract: Mobile Grid network connects large number of mobile devices like smartphones, tablets, PDAs, wireless digital medical equipment's etc for the purpose of sharing their resources and performing the task collaboratively and cooperatively. The mobile nodes participating in the mobile grid are autonomous and open in nature making them more vulnerable to data and control attacks made by malicious or selfish nodes. Preventing these malicious or selfish nodes and identifying the trusted nodes to participate in the network is an NP-hard problem. To recognize trusted nodes in the mobile grid system a novel trust management model is proposed in this paper by applying an elitist multi objective optimization algorithm Non-dominated Sorting Genetic Algorithm-II (NSGA-II). The proposed trust management model assesses the trust index of each mobile node in the network using various evaluation factors or attributes and then obtains the non-dominated set of trusted nodes in each front. Comparative analysis of the proposed trust model shows that the proposed model can be a potential candidate for implementing trust management in mobile grid network.

Keywords: NSGA-II, trust management, mobile grid system

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Predication and Analysis of Epileptic Seizure Neurological Disorder using Intracranial Electroencephalography (iEEG)

SANJAY S. PAWAR, *SANGEETA R. CHOUGULE ,
Ph.D. Scholar, Shivaji University Kolhapur, Assistant Professor, Bharati Vidyapeeth's College of Engineering, Kolhapur, (Maharashtra), INDIA.
sanjaypawar832@gmail.com

*Professor, Kolhapur Institute of Technology College of Engineering, Kolhapur, (Maharashtra), INDIA.
shivsangeeta.chougule@rediffmail.com

Abstract—Epileptic seizure is one of the neurological brain disorder approximately 50 million of world's population is affected. Diagnosis of seizure is done using medical test Electroencephalography. Electroencephalography is a technique to record brain signal by placing electrodes on scalp. Electroencephalography suffers from disadvantage such as low spatial resolution and presence of artifact. Intracranial Electroencephalography is used to record brain electrical activity by mounting strip, grid and depth electrodes on surface of brain by surgery. Online standard Intracranial Electroencephalography data is analyzed by our system for predication and analysis of Epileptic seizure. The pre-processing of Intracranial Electroencephalography signal is done and is further analyzed in wavelet domain by implementation of Daubechies Discrete Wavelet Transform. Features were extracted to classify as preictal and ictal state. Analysis of preictal state was carried out for predication of seizure. Intracranial Electroencephalography signals provide better result and accuracy in seizure detection and predication. Earlier warning can also be issued to control seizure with anti- epileptic drugs.

Keywords—Artifact, Daubechies Discrete Wavelet transform, Epileptic Seizure, Intracranial Electroencephalography, Seizure Classification, Seizure Predication.

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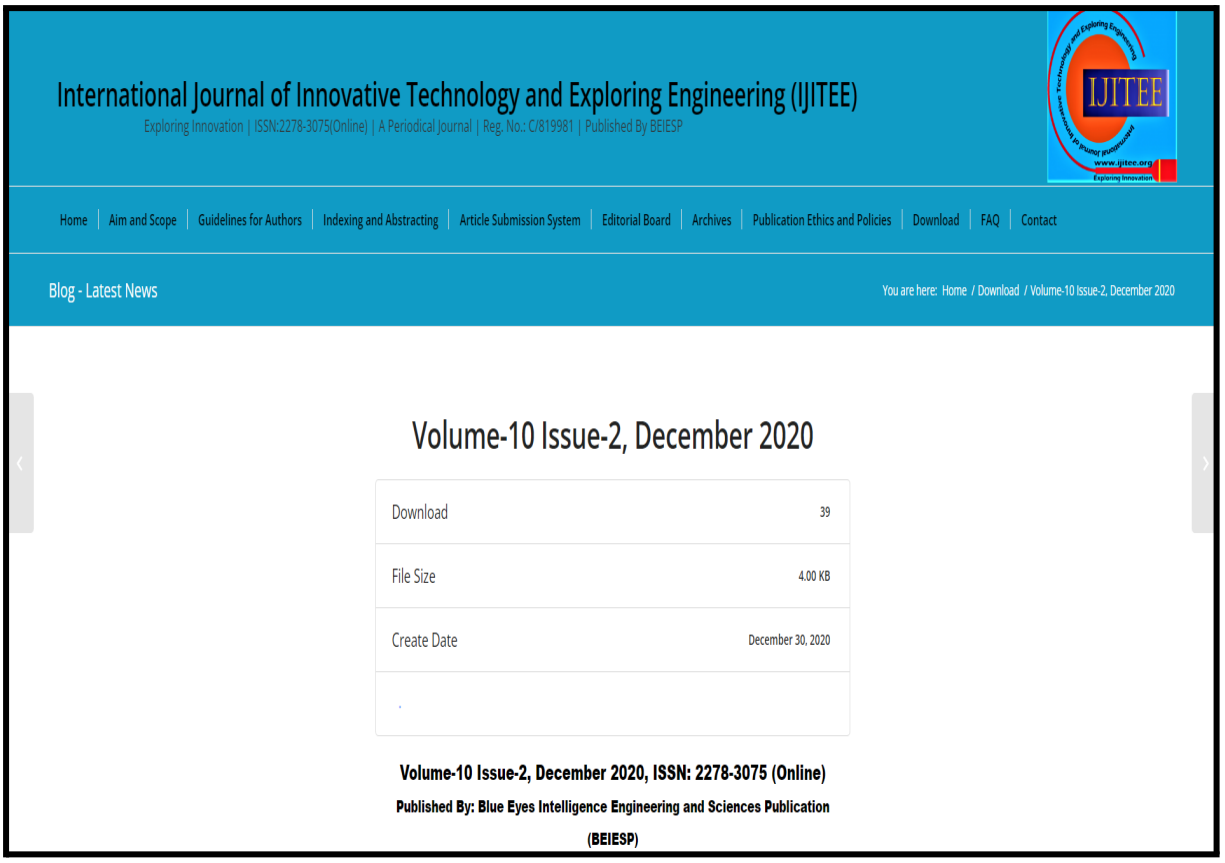
1. Introduction

The status of human whole body is represented by brain function. Central Nervous System (CNS) consists of neurons which transmits information in responses to simulation. Simulation of neuron generates action potential in the voltage range between negative 60 mv to positive 10 mv and the action potential generated remains for 5 Mill second to 10 Mill seconds. Scalp Electroencephalography is used for recording of brain signal to diagnosis many neurological disorders and to detect abnormalities in human body. Electroencephalography signals are used for investigation of Epileptic seizure and testing of drug effect on Epilepsy patients [1]. Scalp Electroencephalography suffers from disadvantage such as low spatial resolution and the signals acquired may be contaminated with noises which are called as artifacts. Presence of artifact affects the performance of seizure detection system and predication of seizure is also difficult in scalp Electroencephalography. Intracranial Electroencephalography (iEEG) is a clinical technique where strip, grid or depth electrodes are implanted on surface of brain by surgery to monitor brain activities. Intracranial Electroencephalography helps in exact diagnosis of epilepsy syndrome and in planning of drug management for epileptic surgery. Intracranial Electroencephalography confirm region of seizure for planning epilepsy surgery. Development of seizure predication system may enhance quality, safety and life of patient.

Detection of Epileptic seizures using Electroencephalography (EEG) dataset and Intracranial Electroencephalography (iEEG) dataset has attracted many researchers to develop various algorithms with good sensitivity, specificity, accuracy and True predicative value. Automatic seizure detection was carried out using wavelet decomposition in five scales of multi-channel intracranial EEG. Features such as Energy, relative amplitude, coefficient of variation and fluctuation index were extracted and classified using support vector machine for seizure detection [2]. One–class support vector machine novelty detection method was implemented for detecting of seizure using Intracranial Electroencephalography. Short-time, energy-based statistics were computed. Validation of detector was done using leave-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Classification and Severity Measurement of Epileptic Seizure using Intracranial Electroencephalogram (iEEG)

Sanjay Shamrao Pawar, Sangeeta Rajendra Chougule

Abstract: ***The Epileptic seizure is one of major neurological brain disorders and about 50 million of world's population is affected by it. Electroencephalography is medical test which records brain signal by mounting electrodes on scalp or brain cortex to diagnosis seizure. Scalp Electroencephalography has low spatial resolution and presence of external artifact as compared to Intracranial Electroencephalography. In Intracranial Electroencephalography strip, grid and depth type of electrodes are implanted on cortex of brain by surgery to measure brain signal. Analysis of brain signal was carried out in past in diagnosis of Epileptic seizure. Seizure classification and Severity measurement of Epileptic Seizure are still challenging areas of research. Seizures are classified as focal seizure, generalized and secondary generalized seizure depending upon the area of brain which it generates and how it spreads. Classification of seizure helps in treatment of seizure and during brain surgery to operate on brain part which is responsible for continuous seizures generation. Developed seizure classification algorithm classifies seizures as focal Seizure, generalized Seizure and secondary generalized seizure depending on the percentage of iEEG electrodes detecting seizure activity. Seizure severity measurement scale is developed by modification in National Hospital Seizure Severity Scale. Seizures are graded as Mild seizure, Moderate seizure and severe seizure depending on its severity. Seizure Classification and Seizure Severity Measurement improves life quality of Epileptic patients by proper drug management.***

Keywords: ***Epileptic Seizure, Intracranial Electroencephalography, Quality of life, Seizure Classification, Seizure Severity Scale***

I. INTRODUCTION

The function of brain represents the status of whole human body. The neurons present in Central nervous system (CNS) transmit information in responses to simulation. The action potential is generated in response to simulation, which is in the voltage range between negative 60 millivolt to positive 10 millivolt. The action potential generated remains for time period of 5 Mill second to 10 Mill seconds [1]. Electroencephalography is a medical test used for recording the brain signal by placing electrodes on scalp or implanting electrodes on cortex of brain. The brain signals are used to diagnosis various neurological disorders and to detect abnormalities in human body. Scalp Electroencephalography and Intracranial Electroencephalography (iEEG) are used for diagnosis of Epileptic seizure and testing of anti-epileptic drug effect on Epilepsy patients [2]. Scalp Electroencephalography has low spatial resolution as compared to Intracranial Electroencephalography (iEEG). The brain signals acquired by scalp EEG may be contaminated with presence of artifacts and may affect accuracy during seizure classification and seizure severity. Intracranial Electroencephalography (iEEG) is a clinical technique where strip, grid or depth electrodes are implanted over the cortex of brain by surgery to monitor brain activities. Classification of seizure provides exact region of brain from where the seizures are generated and how it is spread. Classification is helpful in drug management and epileptic surgery. Seizure severity measurement and grading the seizure as Mild seizure, Moderate seizure and severe seizure is helpful in surgical treatment and drug management. Classification of seizure and severity measurement can improve life quality of Epileptic patients by proper drug management. Diagnosis of Epileptic seizures using scalp Electroencephalography (EEG) dataset and Intracranial Electroencephalography (iEEG) dataset has attracted many researchers to develop various algorithms. Seizure classification and seizure severity measurement still remains neglected area of research. Automatic seizure detection was carried out by implementation of wavelet decomposition in five scales of multi-channel intracranial EEG. Features such as Energy, relative amplitude, coefficient of variation and fluctuation index were extracted and classified using support vector machine for seizure detection [3]. One–class support vector machine novelty detection method was implemented for detecting of seizure using Intracranial Electroencephalography. Short-time, energy-based statistics were computed. Validation of detector was done using leave-one-out cross-validation [4]. Seizure detection was carried out using Lacunarity and Bayesian Linear Discriminant Analysis (BLDA) using long-term Freiburg intracranial EEG dataset.

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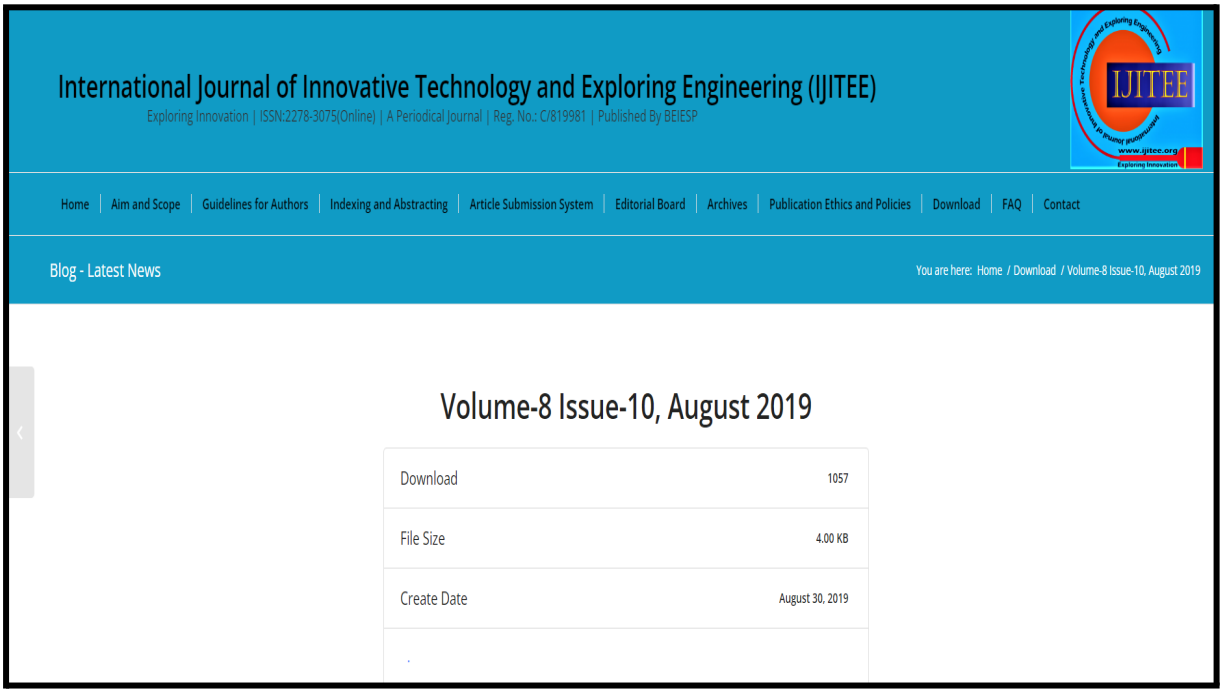
* Correspondence Author
Sanjay Shamrao Pawar*, Ph.D. Scholar, Shivaji University Kolhapur, Assistant Professor, Bharati Vidyapeeth's College of Engineering, Kolhapur, (Maharashtra), India. Email: sanjaypawar832@gmail.com
Sangeeta Rajendra Chougule, Professor, Kolhapur Institute of Technology College of Engineering, Kolhapur, (Maharashtra), India. Email: shivsangeeta.chougule@rediffmail.com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A Fuzzy Lattice System to Trust Management in Mobile Grid

Grantej Vinod Otari, Vijay Ram Ghorpade, Sachin Harakhchand Dhanani

Abstract : ***Mobile Grid is a crossbreed technology formed by amalgamation of the two prominent technologies namely mobile technology and grid technology that enable sharing and collaboration of mobile resources cooperatively, transparently, efficiently, reliably and securely. Mobile Grid considers the mobility issues and overcomes the constraints and deficiencies in both the technologies. However, this heterogeneous, dynamic and open mobile grid network is more prone to malicious and selfish nodes inside and outside the network. Hence, a vigorous security mechanism is needed that considers different security threats and pro-vide different levels of security services. Here, we propose one such preventive security service based on Trust Management. The proposed trust management service uses a novel fuzzy lattice approach for trust estimation of the nodes in the network. A node with high trust value is allowed to participate in the network. A malicious node having low trust value is prevented from performing the task. A fuzzy lattice approach can compute incrementally the same intervals in the training data independent of the order of presentation within a short period. Experimental analysis of the fuzzy lattice approach shows that the proposed approach outperforms most of the existing approaches based on fuzzy logic.***

Keywords: Mobile Gird, Trust Management, Fuzzy Lattice

I. INTRODUCTION

In order to meet the fluctuating and on-demand resources requirements one of the most promising technology has been in the forefront in the form of Grid Computing. Grid computing allows to share and allocate heterogeneous and distributed resources dynamically. This results in an open and dynamic environment providing computational and storage resources in the form of grid services. The grid service providers need to ensure a secure grid environment to the users of the remote resources for executing their tasks remotely and storing the data on the remote storage resources securely.

With the exponential growth of wireless electronic devices such as smart phones, PDA, laptops etc. along with the high speed internet many recent advents have been done by the researchers and industry to enrich the new comping paradigm of mobile computing. Mobile computing allows collaboration of mobile devices having limited resources such as battery, processor, input/output interfaces and instability in data transfer to solve a common problem. Providing security of such limited and precious resources in mobile devices which are being shared in a highly dynamic, open and heterogeneous environment is a challenging problem.

The Mobile Grid [1] is a crossbreed technology incorporating grid of mobile devices thus addressing mobility issues and providing mobility to the resources and users in a continuous, transparent, secure and effective manner. This allows us to form a self-organized grid system consisting of an underlying ad-hoc network of mobile devices interconnected by wireless network and constructing random and dynamic network topology. Thus the security infrastructure in the mobile grid system should deal with various aspects of security issues both in grid computing and mobile computing.

In the mobile grid network, every node plays the dual role as client and server. Thus mobile grid resources are exposed to distributed and open dynamic environment. However, such mobile grid networks are extremely prone to malicious participants dispersing false contents causing unrecoverable security threat to the system. A viable solution is to develop a trust model which provides a mechanism to establish a trusted relationship between the participating resources and allowing them to share the task and data les securely collaboratively. In the trust model, every peer assesses every other peer in the network after each trans-action. Then a peer selects the trustworthy peer for further transaction based upon its past transaction experiences.

Evaluating trustworthiness of a peer in the mobile grid is a complex problem as trust is a linguistically fuzzy concept. To solve this complex problem of trust calculation fuzzy logic is a good alternative solution. Also it has been observed that all the peers in the network are not always cooperative and may send false feedback to disrupt the reputation of the peers and contribute to the errors in global trust calculation. Thus a robust trust estimation model is needed that detects malicious peers and check the credibility of the recommendations received from such peers. In addition the trust model should also deal with the estimation of trust of the newly joined node in the network.

In this paper, we have designed a novel trust management system based on a fuzzy lattice approach. The proposed model uses multiple attributes of the mobile node to evaluate the direct trust value. These input attributes indicate the capability of the node to perform the specific task based on the currently available resources and its previous performance. The trust model then estimates indirect trust by collecting the recommendations from the neighbors in the network and considering the credibility of the recommenders. Finally, the obtained direct trust value and indirect trust value is aggregated to compute the global trust of a node.

II. RELATED WORK

There exists a vast and diverse literature for development of trust model. Numerous possible approaches and measures are used for trust calculation. Some approaches use continuous values to measure the trust, while some methods use discrete values. Some models are based on probabilistic approach whereas some others use threshold based approach.

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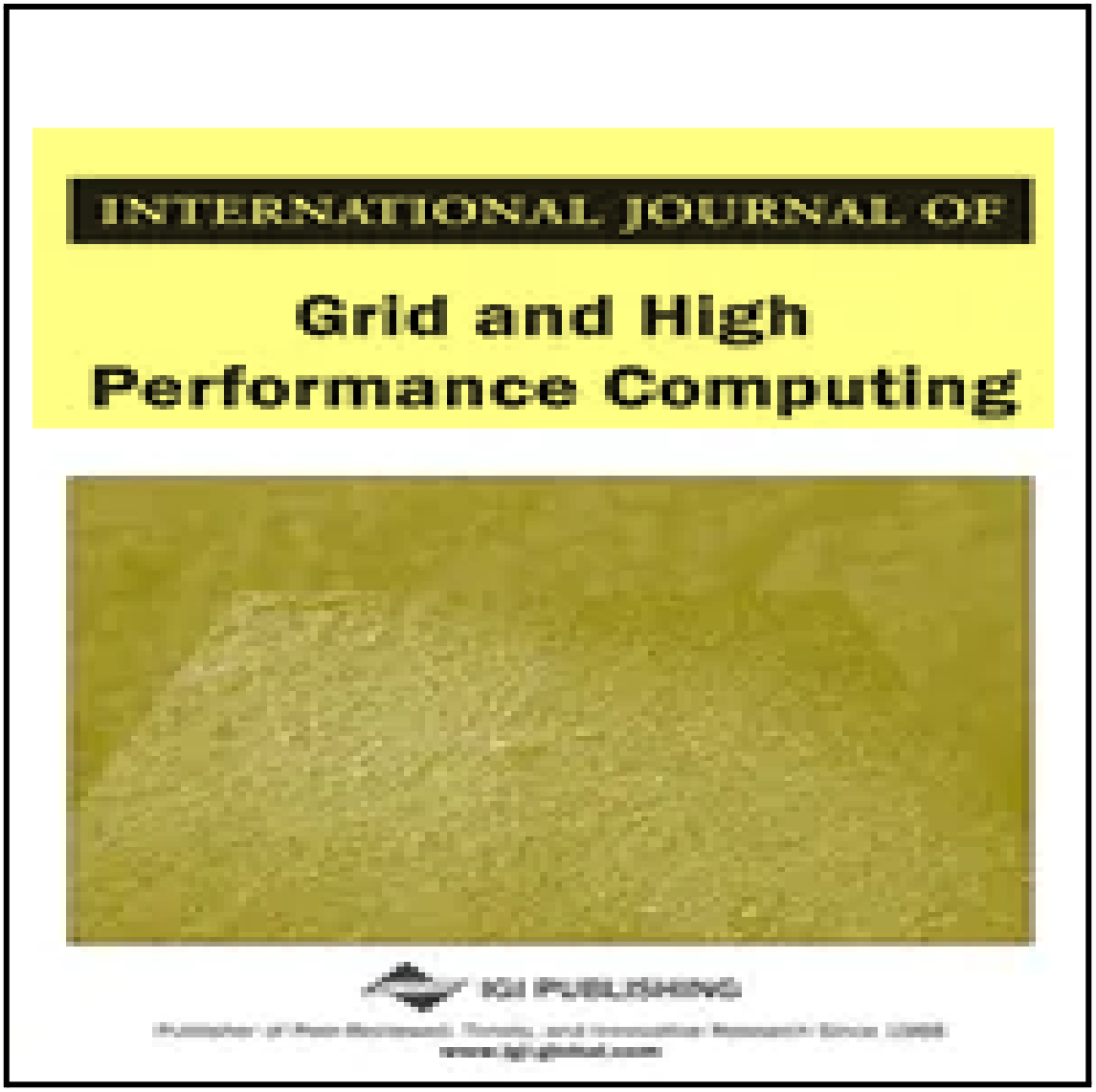
Grantej Vinod Otari, Department of Computer Science & Engineering Shivaji University Kolhapur, India
Dr. Vijay Ram Ghorpade, Department of Computer Science & Engineering Bharati Vidyapeeth's College of Engineering Kolhapur, India
Dr. Sachin Harakhchand Dhanani, Department of Mathematics K.I.T.'s College of Engineering, Kolhapur, India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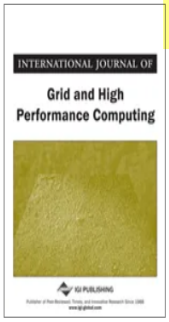

Application Checkpointing Technique for Self-Healing From Failures in Mobile Grid Computing

Amit Sadanand Savyanavar (Dr. D.Y. Patil College of Engineering and Technology, Shivaji University, Kolhapur, India) and Vijay Ram Ghorpade (Bharati Vidyapeeth's College of Engineering, Kolhapur, India)

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Abstract

A mobile grid (MG) consists of interconnected mobile devices which are used for high performance computing. Fault tolerance is an important property of mobile computational grid systems for achieving superior arrangement reliability and faster recovery from failures. Since the failure of the resources affects task execution fatally, fault tolerance service is essential to achieve QoS requirement in MG. The faults which occur in MG are link failure, node failure, task failure, limited bandwidth etc. Detecting these failures can help in better utilisation of the resources and timely notification to the user in a MG environment. These failures result in loss of computational results and data. Many algorithms or techniques were proposed for failure handling in traditional grids. The authors propose a checkpointing based failure handling technique which will improve arrangement reliability and failure recovery time for the MG network. Experimentation was conducted by creating a grid of ubiquitously available Android-based mobile phones.

1. Introduction

Recent advances in the computing power of mobile devices has made it feasible to generate a true mobile grid (MG) (Savyanavar et al., 2013) consisting of only mobile devices for high performance computations. Collaborative computing using MG involves a number of mobile devices like laptop, cell phones, PDA, wearable computing devices and mobile robotic systems. MG provides a framework for numerous real-life applications in the areas of healthcare, disaster management and military applications. Addressing failure of nodes is more critical in MG than conventional wired grids due to host mobility, dynamicity, less reliable wireless links and frequent disconnections in mobile systems. Mobility (Savyanavar et al., 2015) of the nodes aggravates the reliability issue in MG. MG follows peer-to-peer computing architecture (Tung et al., 2012). Due to peer volatility, peer failure is a critical issue in peer-to-peer computing. In such networks, a peer may leave unpredictably. This peer may be executing a subtask, which would fail abruptly and hence affect the overall execution of the application. An efficient fault tolerance mechanism is pivotal for successful execution of the application. Replication and rollback (Treaster et al., 2005) are two failure handling


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RESPONSIVENESS OF HEIS TO INDUSTRIAL REVOLUTION 4.0

Jayamala K. Patil[1], Vijay R. Ghorpade[2], Veeresh P. M.[3]
Associate Professor[1], Principal & Professor[2] and Assistant Professor[3]
Bharati Vidyapeeth's College of Engineering, Kolhapur

ABSTRACT

Higher Education (HE) is the integral part of developed and developing countries. HE ensures world about well trained, skilled and creative manpower. There is direct relation of revolution in industry and Higher Educational Institutes (HEIs) as graduates contributes in new innovative technologies by means of research, development, testing and servicing. Hence, it is the responsibility of HEIs to mold itself in terms of resources, curriculum, teaching learning mechanism, assessment tools, students skill development, lifelong learning strategies, interaction with stake holders etc. This paper puts light on some of these aspects where HEIs which are affiliated to universities has to respond immediately as a response to advancements in Industrial Revolution 4.0.

1. INTRODUCTION

Any revolution is indication of liveliness in that field. World has observed three industrial revolutions and experienced magic of it in industrial production and in turn on livelihood of all livings. The first industrial revolution is derived by Newton's laws of motion which made it possible to design steam engines that atomized much of the work done by humans and made humans more productive (Bo Xing and Tshilidzi Marwala 2018, p.1; Nancy W. Gleason 2018, p.2). The second industrial revolution which is recognized as electric generation has a impact of Faraday and Maxwell's theory of magnetic and electric forces. The discovery of transistor given birth to third industrial revolution which is known as electronic generation. It gifted world with Computers and Internet. Fourth industrial revolution named 'Industry 4.0' started in early 2000s with Germany's manufacturing industry. This has the power to change many things across a broad spectrum. It will transform industries to a large extent such that much of the work that exists today will not exists in next 50 years. According to survey by Deloitte and Forbes Insights, in Industry 4.0 revolution the daily lives will be full of smart technologies as an effect of revolution in digital and physical technological world. Though it will create vast possibilities and opportunities; it will also create uncertainty. According to opinion of Chun-Yuan Gu, in this revolution the knowledge, which takes an organization decades to gain, becomes more accessible to new organizations with less experience and with the right technology (Deloitte and Forbes Insights 2018, p.22).

The education sector will not stand apart from this advancement of Industry 4.0. This may introduce new requirements for the profile and qualification of graduates. It may demand even more than before, people's capacity for initiative, entrepreneurship skills, digital literacy, critical thinking and ability to define personal learning needs and identify possible sources for such learning. To produce such graduates and to cope up with requirements for the same is now a most demandable task for HEIs. HEIs has focus on meeting different needs and requirements of various target groups. But to produce the graduates of above qualities, HEIs has to be flexible and always there is space for a well profiled, professional HEIs to introduce such flexibilities. New patterns and tools of learning as well as assessment may be introduced to produce more flexibility. It may need a substantial shift in curricula development. The HEIs has to transform from "school" to a "hub" connecting various stakeholders within their community, allowing suitable provisions for combination of teaching, learning, research and knowledge exchange involving partners and collaborators from outside education (Alexandre Wipf 2017, P.7). While all higher education institutions will put some focus on meeting the digitalization agenda, there was a shared belief that professional higher education should still find suitable approaches to address different target groups needing more profession-specific skills and competences. At the same time, the prevailing expectation is that the digitalization agenda will enhance the opportunities for internationalization and opening new markets for those who will be ready.

The rest of the paper is organized as follow: second section summarizes the response of HEIs to first 3 industrial revolutions, third section briefs the responsiveness of HEIs to Industrial Revolution 4.0 and fourth section presents conclusion.

2. RESPONSIVENESS OF HEIS TO FIRST THREE INDUSTRIAL REVOLUTIONS

The first industrial revolution based on steam engines brought a dramatic shift in the classical education. A curriculum with more diverse degree options and new general education programs designed to produce breadth of study through the selection from a variety of elective courses. The second industrial revolution intended to open the industrial classes in education system to create newly trained technicians and engineers. In third


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Convolutional neural networks for leaf image-based plant disease classification

Sachin B. Jadhav, Vishwanath R. Udupi, Sanjay B. Patil

Abstract

Plant pathologists desire soft computing technology for accurate and reliable diagnosis of plant diseases. In this study, we propose an efficient soybean disease identification method based on a transfer learning approach by using a pre-trained convolutional neural network (CNN's) such as AlexNet, GoogleNet, VGG16, ResNet101, and DensNet201. The proposed convolutional neural networks were trained using 1200 plant village image dataset of diseased and healthy soybean leaves, to identify three soybean diseases out of healthy leaves. Pre-trained CNN used to enable a fast and easy system implementation in practice. We used the five-fold crossvalidation strategy to analyze the performance of networks. In this study, we used a pre-trained convolutional neural network as feature extractors and classifiers. The experimental results based on the proposed approach using pre-trained AlexNet, GoogleNet, VGG16, ResNet101, and DensNet201 networks achieve an accuracy of 95%, 96.4%, 96.4%, 92.1%, 93.6% respectively. The experimental results for the identification of soybean diseases indicated that the proposed networks model achieves the highest accuracy

Keywords

AlexNet CNN; Deep CNN; DensNet201 CNN; Disease classification; GoogleNet CNN; Machine learning; ResNet101 CNN; VGG16 CNN


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Identification of plant diseases using convolutional neural networks

Sachin B. Jadhav, Vishwanath R. Udupi & Sanjay B. Patil

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Abstract

Plant pathologists desire an accurate and reliable soybean plant disease diagnosis system. In this study, we propose an efficient soybean diseases identification method based on a transfer learning approach by using pretrained AlexNet and GoogleNet convolutional neural networks (CNNs). The proposed AlexNet and GoogleNet CNNs were trained using 649 and 550 image samples of diseased and healthy soybean leaves, respectively, to identify three soybean diseases. We used the five-fold cross-validation strategy. The proposed AlexNet and GoogleNet CNN-based models achieved an accuracy of 98.75% and 96.25%, respectively. This accuracy was considerably higher than that for conventional pattern recognition techniques. The experimental results for the identification of soybean diseases indicated that the proposed model achieved highest efficiency.


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Soybean leaf disease detection and severity measurement using multiclass SVM and KNN classifier

Sachin B. Jadhav, Vishwanath R. Udup, Sanjay B. Patil

Abstract

Soybean fungal diseases such as Blight, Frogeye leaf spot and Brown Spot are a significant threat to soybean plant due to the severe symptoms and lack of treatments. Traditional diagnosis of the thease diseases relies on disease symptom identification based on neaked eye observation by pathalogiest, which can lead to a high rate of false-recognition. This work present a novel system, utilizing multiclass support vector machine and KNN classifiers, for detection and classification of soybean diseases using color images of diseased leaf samples. Images of healthy and diseased leaves affected by Blight, Frogeye leaf spot and Brown Spot were acquired by a digital camera. The acquired images are preprocessed using image enhancement techniques. The background of each image was removed by a thresholding method and the Region of Interest (ROI) is obtained. Color-based segmentation technique based on K-means clustering is applied to the region of interest for partitioning the diseased region. The severity of disease is estimated by quantifying a number of pixels in the diseased region and in total leaf region. Different color features of segmented diseased leaf region were extracted using RGB color space and texture features were extracted using Gray Level Co-occurrence Matrix (GLCM) to compose a feature database. Finally, the support vector machine (SVM) and K-Nearest Negbiour (KNN) classifiers are used for classifying the disease. This proposed classifers system is capable to classify the types of blight, brown spot, frogeye leaf spot diseases and Healthy samples with an accuracy of 87.3% and 83.6 % are achieved.

Keywords

image processing


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RESPONSIVENESS OF HEIS TO INDUSTRIAL REVOLUTION 4.0

Jayamala K. Patil[1], Vijay R. Ghorpade[2], Veeresh P. M.[3]
Associate Professor[1], Principal & Professor[2] and Assistant Professor[3]
Bharati Vidyapeeth's College of Engineering, Kolhapur

ABSTRACT

Higher Education (HE) is the integral part of developed and developing countries. HE ensures world about well trained, skilled and creative manpower. There is direct relation of revolution in industry and Higher Educational Institutes (HEIs) as graduates contributes in new innovative technologies by means of research, development, testing and servicing. Hence, it is the responsibility of HEIs to mold itself in terms of resources, curriculum, teaching learning mechanism, assessment tools, students skill development, lifelong learning strategies, interaction with stake holders etc. This paper puts light on some of these aspects where HEIs which are affiliated to universities has to respond immediately as a response to advancements in Industrial Revolution 4.0.

1. INTRODUCTION

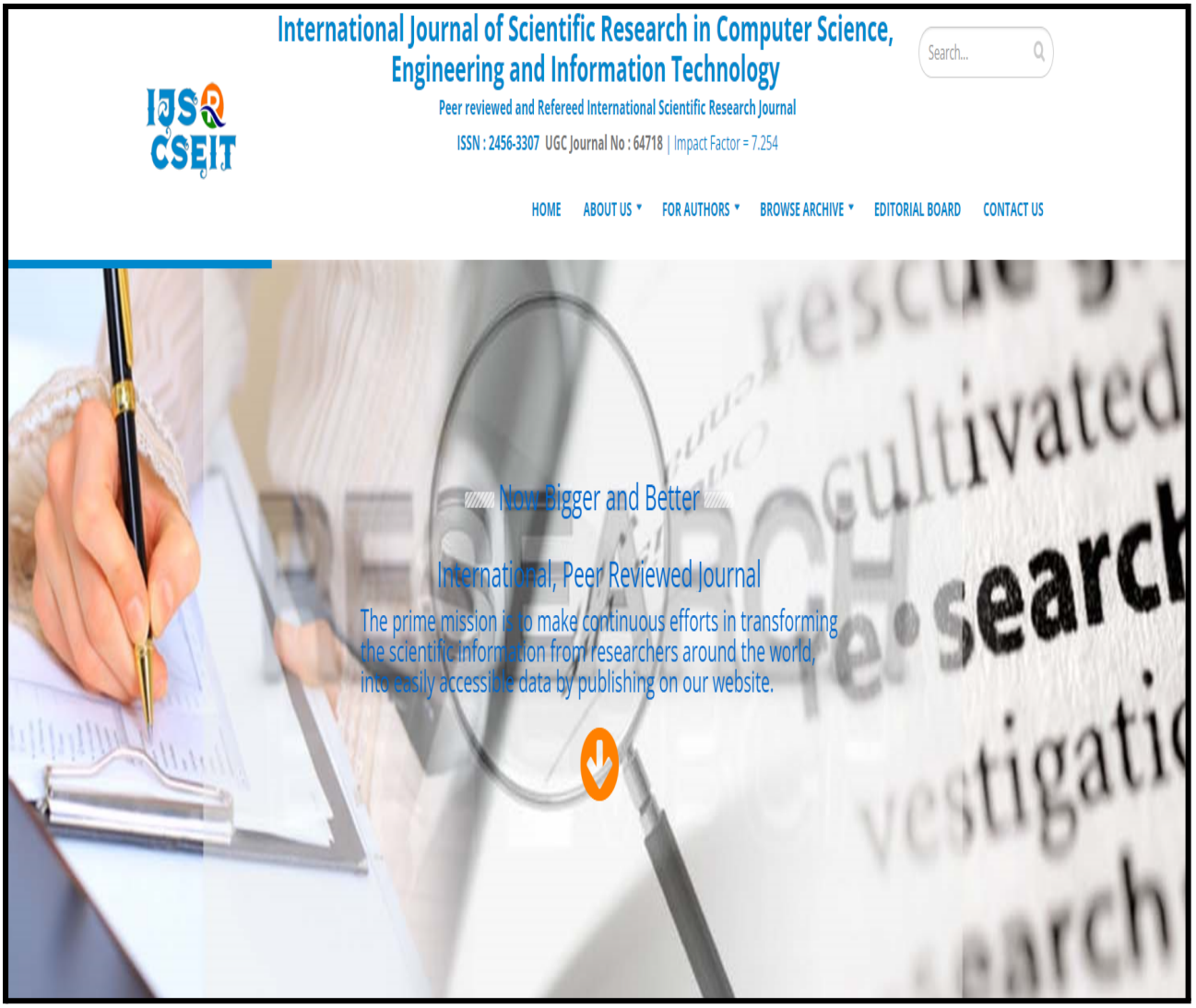
Any revolution is indication of liveliness in that field. World has observed three industrial revolutions and experienced magic of it in industrial production and in turn on livelihood of all livings. The first industrial revolution is derived by Newton's laws of motion which made it possible to design steam engines that atomized much of the work done by humans and made humans more productive (Bo Xing and Tshilidzi Marwala 2018, p.1; Nancy W. Gleason 2018, p.2). The second industrial revolution which is recognized as electric generation has a impact of Faraday and Maxwell's theory of magnetic and electric forces. The discovery of transistor given birth to third industrial revolution which is known as electronic generation. It gifted world with Computers and Internet. Fourth industrial revolution named 'Industry 4.0' started in early 2000s with Germany's manufacturing industry. This has the power to change many things across a broad spectrum. It will transform industries to a large extent such that much of the work that exists today will not exists in next 50 years. According to survey by Deloitte and Forbes Insights, in Industry 4.0 revolution the daily lives will be full of smart technologies as an effect of revolution in digital and physical technological world. Though it will create vast possibilities and opportunities; it will also create uncertainty. According to opinion of Chun-Yuan Gu, in this revolution the knowledge, which takes an organization decades to gain, becomes more accessible to new organizations with less experience and with the right technology (Deloitte and Forbes Insights 2018, p.22).

The education sector will not stand apart from this advancement of Industry 4.0. This may introduce new requirements for the profile and qualification of graduates. It may demand even more than before, people's capacity for initiative, entrepreneurship skills, digital literacy, critical thinking and ability to define personal learning needs and identify possible sources for such learning. To produce such graduates and to cope up with requirements for the same is now a most demandable task for HEIs. HEIs has focus on meeting different needs and requirements of various target groups. But to produce the graduates of above qualities, HEIs has to be flexible and always there is space for a well profiled, professional HEIs to introduce such flexibilities. New patterns and tools of learning as well as assessment may be introduced to produce more flexibility. It may need a substantial shift in curricula development. The HEIs has to transform from "school" to a "hub" connecting various stakeholders within their community, allowing suitable provisions for combination of teaching, learning, research and knowledge exchange involving partners and collaborators from outside education (Alexandre Wipf 2017, P.7). While all higher education institutions will put some focus on meeting the digitalization agenda, there was a shared belief that professional higher education should still find suitable approaches to address different target groups needing more profession-specific skills and competences. At the same time, the prevailing expectation is that the digitalization agenda will enhance the opportunities for internationalization and opening new markets for those who will be ready.

The rest of the paper is organized as follow: second section summarizes the response of HEIs to first 3 industrial revolutions, third section briefs the responsiveness of HEIs to Industrial Revolution 4.0 and fourth section presents conclusion.

2. RESPONSIVENESS OF HEIS TO FIRST THREE INDUSTRIAL REVOLUTIONS

The first industrial revolution based on steam engines brought a dramatic shift in the classical education. A curriculum with more diverse degree options and new general education programs designed to produce breadth of study through the selection from a variety of elective courses. The second industrial revolution intended to open the industrial classes in education system to create newly trained technicians and engineers. In third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Designing a Data Structure Utility List and High Utility Sequential Pattern for One phase in Data Mining

Kaushik Dattatraya Kulkarni[1], Rahul P. Mirajkar[2]

[1] Student, ME (CSE), Bharati Vidyapeeth's College of Engineering, Kolhapur, Maharashtra, India

[2] Asstt Professor, Bharati Vidyapeeth's College of Engineering, Kolhapur. Maharashtra, India

ABSTRACT

High utility item set mining finds item set from the database which have their utility no less than minimum threshold, the most significant task in data mining is the process to discovering the different type of pattern algorithm that generate the mining pattern. Sequence of database rather than strings and it can capture the set of sequential pattern. Data mining consist extracting information from data stored in databases to understand the data. Pattern mining consists of discovering interesting, useful, and unexpected pattern in databases.

Keywords : Data mining, Database, sequential pattern mining, High utility, item set

I. INTRODUCTION

In sequential pattern mining that pattern can maintain their sequential. Item set may generating in sequential manner without any duplication. Data mining consist extracting information from data stored in databases to understand the data. Pattern mining consists of discovering interesting, useful, and unexpected pattern in databases. Sequential pattern mining is a data mining is a data mining task specialized for analyzing sequential data to discover sequential pattern. Efficient Mining of High Utility Item set from large data set these algorithm search large transactional weighted utilization item in transaction database. It is used to mine the complete set of high utility item set. Implied a structure named High Utility of Pattern tree for maintaining essential information about utility mining.

Each node in enumeration tree will be contain generating different pattern that will be useful for utility of sequential pattern mining to maintain this pattern in linear data structure will be developed. It will be contain information about each item relevant of pattern. . High utility pattern that can be finding the pattern from database that have a utility value. The utility of pattern defines defines the its importance and makes mined pattern.

1.1 MOTIVATION:

Efficient Mining of High Utility Item set from large data set these algorithm search large transactional weighted utilization item in transaction database. It is used to mine the complete set of high utility item set. Implied a structure named High Utility of Pattern tree for maintaining essential information about utility mining. It avoids scanning of multiple times generating pattern during mining process. Identifying better estimate of the utility value of pattern and systematic search of space for pattern using the estimate. Data structure which helps into computation of better estimate will improve the performance of mining algorithms by effectively search space.

II. OBJECTIVES

- Generating the High Utility Sequential Pattern in one phase

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Auto Determination of K in KMEANS with MAP-REDUCE for Numerical and Text Datasets

Ms. K. P. Shiudkar[*1], Prof. S. B. Takmare[2], Prof. R. P.Mirajkar[3]

[*1]ME CSE Student, Bharati Vidyapeeth College of Engineering, Kolhapur, Maharashtra, India
[2]Assistant Professor, Department of CSE, A P Shah Institute of Technology Thane, Maharashtra, India
[3]Assistant Professor, Department of CSE, Bharati Vidyapeeth college of Engineering Kolhapur, Maharashtra, India

ABSTRACT

Data mining is the process of automatically discovering useful information in large datasets. Clustering analysis is a very important branch in data mining. Cluster analysis based on the data objects and their relationships and grouping of data objects. Clustering very large datasets is a challenging problem for data mining and processing. Map Reduce is considered as a powerful programming framework, which significantly reduces executing time by dividing a job into several tasks, and executes them in a distributed environment. K-Means, which is one of the most used clustering methods, and K-Means based on Map Reduce is considered as an advanced solution for very large dataset clustering. However, the executing time is still an obstacle due to the increasing number of iterations when there is an increase of dataset size and number of clusters. The traditional k-means is computationally expensive, sensitive to outliers and has an unstable result hence its inefficiency when dealing with very large datasets. Solving these issues is the subject of much recent research work. In this paper, we propose an Auto determination of K in KMEANS with MAP-REDUCE for numerical and text datasets in order to adapt it to handle large-scale datasets by reducing its execution time. In addition, we proposed algorithms to find the initial centroids automatically and cluster are formed on both numerical and text both datasets.

Keywords : Initial Centroids, Clustering, Data mining, Data sets, K-means clustering, Map-Reduce.

I. INTRODUCTION

Big Data is evolving term that describes any voluminous amount of structured, semi-structured and unstructured data. Big data challenges include capturing data, data storage, data analysis, search, sharing, transfer, visualization, querying, updating, information privacy and data source. Big data represents the information assets characterized "5Vs", volume (size of data set), variety (range of data type and source), velocity (speed of data in and out), value (how useful the data is), and veracity (quality of data) to require specific technology and analytical methods for its transformation into value. It creates challenges in their collection, processing, management and analysis. Big data to the use of predictive analytics, user behaviour analytics, or certain other advanced data analytics methods that extract value from data, and seldom to a particular size of data set. Big data analytics is the process of examining large and varied data sets to uncover hidden patterns, unknown correlations, market trends, customer preferences and other useful information that can help organizations make more-informed business decisions. As new data

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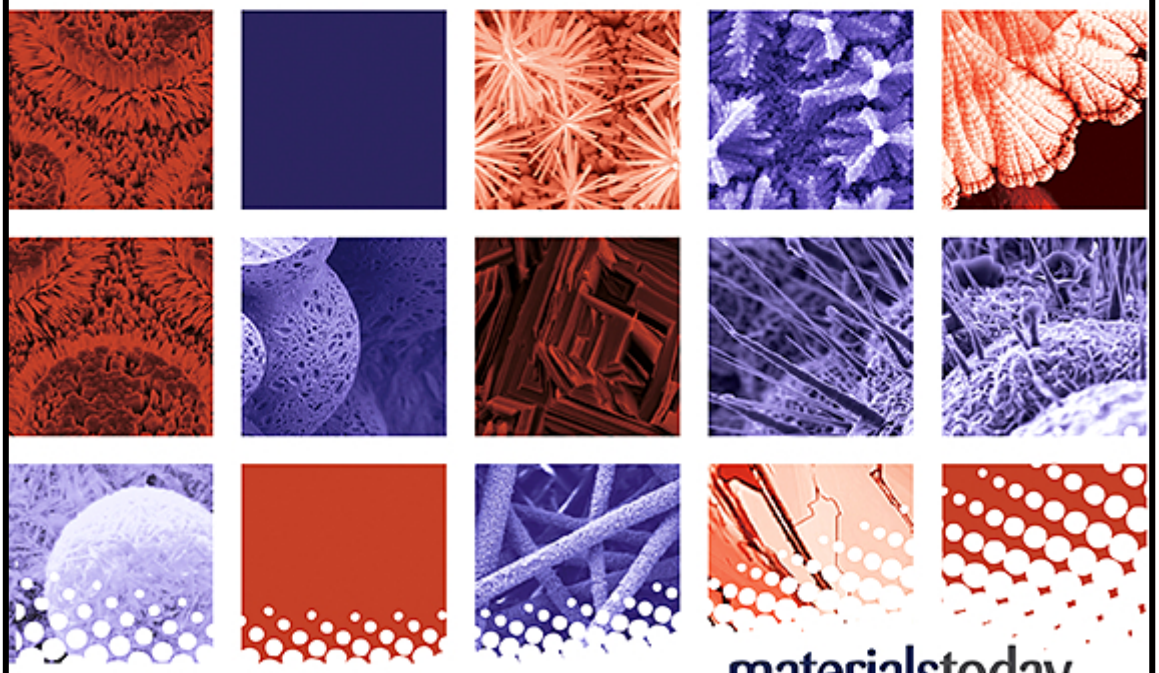

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Parametric Optimization Of Minimum Quantity Lubrication In Turning Of AISI 4340 Using Nano Fluids

P.B. Patole [a], V.V. Kulkarni [b]

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Abstract

Modern machining industries demand for improved surface roughness from micro level to nano level along with increased tool life and reduced cutting temperature and force during machining. Therefore, the aim of this research work is focused on optimization of Minimum Quantity Lubrication (MQL) parameters using nano fluids in turning of AISI 4340. A study of effect of MQL parameters on the surface roughness of AISI 4340 was carried out using nano fluid such as Multi Walled Carbon Nano Tube (MWCNT). In the experiment conducted, four values of pressure, four values of flow rate and two types of nano fluids were used. The chemical composition of the work material was tested using arc spectrometer and verified to be of grade AISI 4340. The test pieces were turned on a CNC lathe machine under MQL mode using nano fluid with different levels of MQL parameters by using Taguchi L16 orthogonal array. The surface roughness of the machined surface was measured using surface measurement tester. Taguchi methodology was used to optimize MQL parameters. The results were analyzed using Analysis of Variance (ANOVA). From result analysis, it was shown that, cutting fluid (Nano fluid) played a major role in producing lower surface roughness followed by flow rate whereas pressure has least significance in producing lower surface roughness under MQL using nano coolant. It was observed that ethylene glycol with nano fluid (MQL1) showed lowest surface roughness as compared to water with nano fluid (MQL2). The optimum condition under MQL mode with nano fluid obtained as pressure (5 bar), flow rate (140 ml/hr.) and cutting fluid type 1. From result analysis it is also observed that, ethylene glycol as a base fluid with nano fluid is a most significant factor affecting surface roughness. The percentage error between experimental and predicted surface

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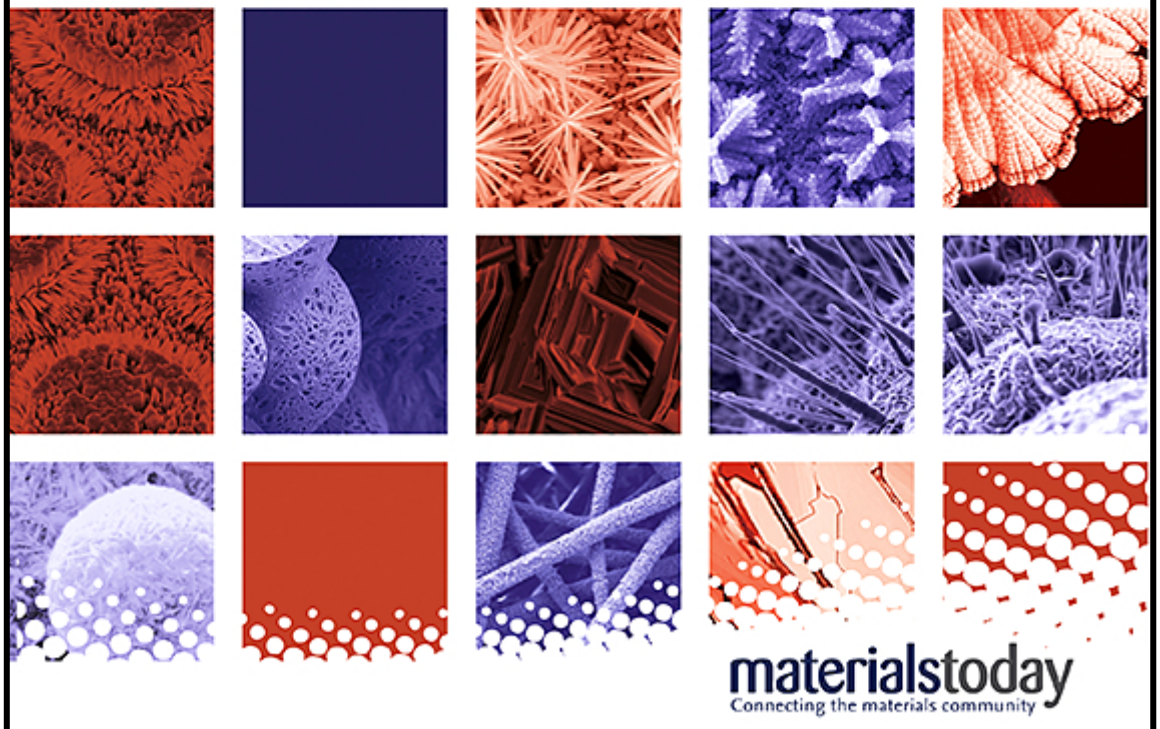

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Optimization of Process Parameters based on Surface Roughness and Cutting Force in MQL Turning of AISI 4340 using Nano Fluid

P.B. Patole [a], V.V. Kulkarni [b]

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Abstract

The aim of this research work is focused on optimization of process parameters under Minimum Quantity Lubrication (MQL) using nano fluid in turning of AISI 4340. A study of effect of process parameters in turning of AISI 4340 under MQL condition with nano fluid (Multiwalled Carbon Nano Tube) on the cutting force generated and machined surface roughness is carried out. In the experiment conducted, five values of feed rate, three values of depth of cut, two values of cutting speed and tool nose radius respectively, are used. The test pieces were turned on a CNC lathe machine under MQL mode using nano fluid with different levels of process parameters by using full factorial design of experiment orthogonal array. The surface roughness of the machined surface was measured using surface measurement tester. Taguchi methodology was used to optimize process parameters. The results were analyzed by using Analysis of variance. From result analysis, it was found that, feed rate played a major role in producing lower surface roughness followed by depth of cut whereas cutting speed has least significance in producing lower surface roughness under MQL using nano coolant. It was observed that MQL with nano fluid (MWCNT) showed lowest surface roughness as compared to conventional flood system. Thus, with proper selection of process parameters under MQL mode with nano coolant, it is possible to achieve good surface roughness, reduce tool wear while maintaining the cutting forces and temperatures at reasonable levels.


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RESPONSIVENESS OF HEIS TO INDUSTRIAL REVOLUTION 4.0

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AES-VR: A New Approach for Cloud Data Confidentiality

[1]

Ms Rajani Sangappa Sajjan , Dr. Vijay Ram Ghorpade
Department of Computer Science and Engineering, VVPIET, Solapur, MH
[2]*Principal, Bharati Vidyapeeth's College of Engineering, Kolhapur, MH*
[1]*rajanisajjan78@gmail.com,* [2]*vijayghorpade@hotmail.com*

Abstract

Confidentiality is one of the important security parameters related to cloud data security. The confidentiality is provided by applying encryption algorithm. In this paper we are proposing a variant of Advanced Encryption Standard (AES), i.e. AES-VR with a new property of key schedule process. This process is updated by adding a new layer of operation to achieve high diffusion property of cryptographic technique. The results have been tested for standard security parameters, viz. avalanche effect and strict avalanche criteria. This new approach is proposed to provide cloud data confidentiality.

1. Background:

The Advanced Encryption Standard (AES) is one of the symmetric key cryptographic techniques used to provide data confidentiality. It is designed to be effective in both hardware and software. It operates on block of data, byte-wise instead of bitwise. The size of data block used is 128 bits. It supports 3 different key sizes of 128, 192 and 256 bits. The 128 bit data block is treated as 16 bytes data, arranged in 4 X 4 matrix, called as state array. It performs operation in rounds, 10 rounds for 128 bit key, 12 rounds for 192 bit key, and 14 rounds for 256 bit key. AES is based on substitution permutation network hence it has several rounds for performing operation. The number of rounds, N_r, is calculated based on N_k, key size in number of words and N_b, block size in number of words, i.e. $N_r = 6 + \max\{N_b, N_k\}$. In each round it performs four steps of operations except the last round. These operations are listed below.

i. *Key expansion*: cipher key is used as input for key expansion operation
ii. *Initial round*: AddRoundKey: Initially state array is XORed with the first round key.
iii. *Round*: During each round following operations are performed on state array
iv. *Last round*: It is the final round in which following operations are performed on state array
   - SubBytes
   - ShiftRows
   - AddRoundKey

The detailed description about AES can be found in [1] [2]. The AES is widely used to transfer data securely over the network. Since 2001 to till date various research in terms of attacks on AES and solutions for them is carried out. The security of AES lies in complexity of S-box and key schedule process. Below some of the research work related to enhancing security of AES is given followed by the main idea behind proposed AES-VR.

In [3] Partheeban introduced a new approach for building S-box. Here nonlinear transformations are applied to increase the complexity. The S-box is generated dynamically by using secret key used in AES.

In [4] Choy and others have proposed an on-the-fly key schedule which they claim that is resistant against related key differential and boomrang attacks. In this paper they have done the analysis of attacks and their solutions.

P. Freyre and others [5] proposed variations to AES and Twofish algorithms. For achieving this they suggested the use of maximal distance separable (MDS) matrices. They used the set of MDS matrices and any one matrix is randomly selected to process the variation in AES and Twofish. This is done to produce high diffusion. In this scheme space requirement increases to store the set of MDS matrices and introduces extra time required to process the matrix in key scheduling.

Krishnamurthy [6] presented new property of AES using S-box and inverse S-box. This property is used to construct S-box which is key dependent. Abdullah and others [7] proposed AES variant by introducing modification in S-box. To perform this they added extra byte to the secret key. The random additional key is used to increase security. This additional byte imposes extra processing time.

GCM-AES-VR : A Scheme for Cloud Data Confidentiality and Authenticity

Rajani S. Sajjan[1] , **Vijay R. Ghorpade**[2]

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Efficient resource allocation scheme for on-the-fly computing based mobile grids

Amit Sadanand Savyanavar & Vijay Ram Ghorpade

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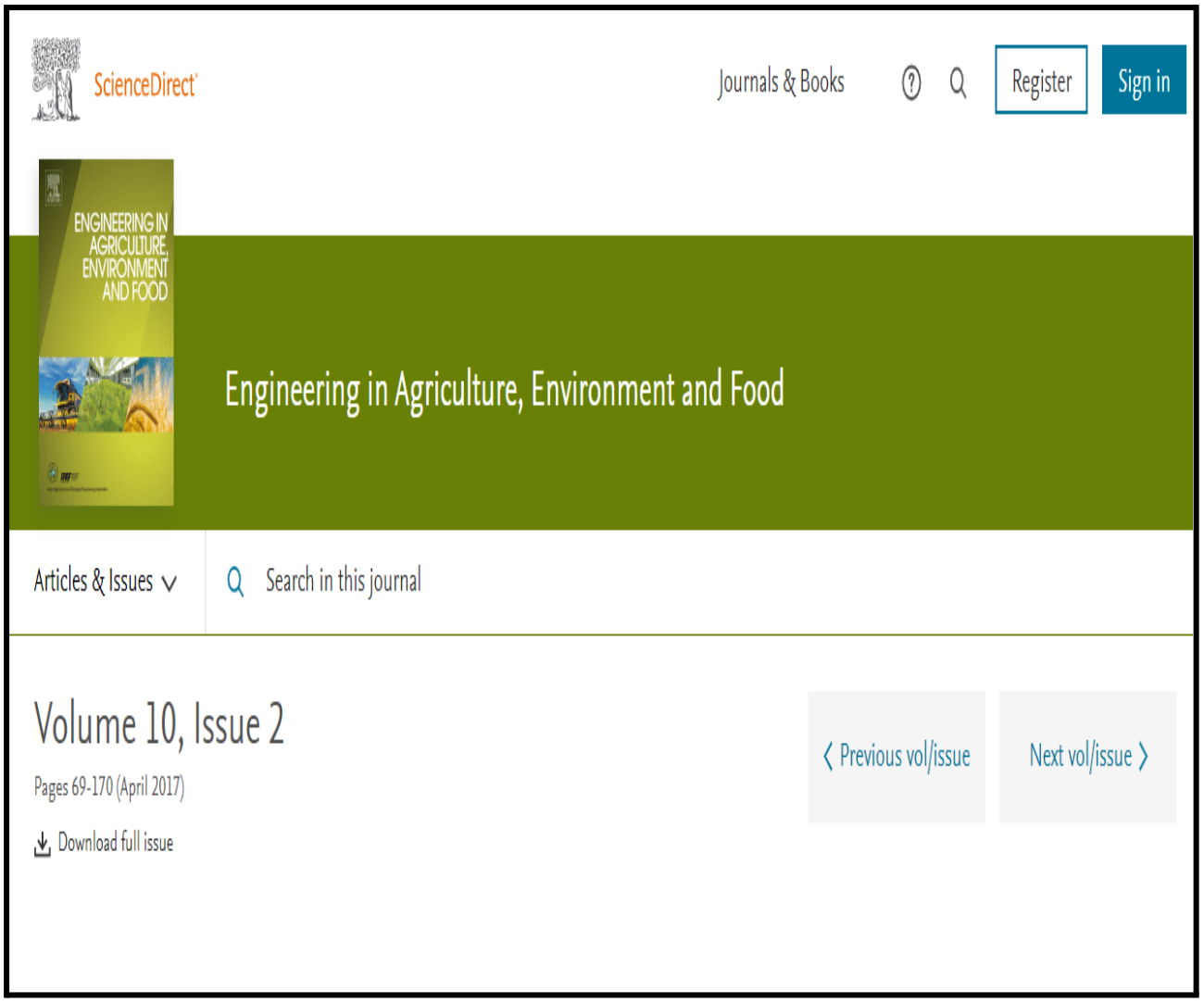
Abstract

Mobile grid (MG) is emergi ng as a new computing paradigm due to the ubiquitous availability of mobile devices. With the advancement in the capability of these devices, computationally intensive tasks can be executed using a peer-to-peer grid of such devices. MG can provide an edifice to execute parallel computationally intensive tasks. Key challenges that crop up while computing on a MG are resource constrained environment, inefficient resource allocation, high failure probability, etc. As a result, selection of appropriate nodes for task execution becomes critical for successful execution of the application. In this paper, we propose an efficient resource allocation model (ERAM) which provides resource allocation with failure handling. We created a MG comprising of Wi-Fi Direct connected Android smartphones. Different scenarios are considered for the purpose of experimentation. Our approach performs well with respect to application completion time, % battery consumption and recovery time from failure in comparison with existing techniques.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Research paper

Analysis of content based image retrieval for plant leaf diseases using color, shape and texture features

Jayamala Kumar Patil [a], Raj Kumar [b]

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Abstract

This research paper is an attempt to present Content Based Image Retrieval (CBIR) system developed for retrieving diseased leaves of soybean. It uses color, shape and texture features of leaf. Color features are extracted using HSV color histogram. Scale Invariant Feature Transform (SIFT) provides shape features in the form of matching key points. Local Binary Pattern (LBP) and Gabor filter are widely used texture features. Novel texture feature named Local Gray Gabor Pattern (LGGP) is proposed by combining LBP and Gabor. Performance of all these features with respect to retrieval precision is tested for three soybean leaf diseases. Further color, shape and texture features are combined to increase performance. It is found that when LGGP is combined with color histogram and SIFT retrieval precision is improved. Retrieval efficiency of about 96%, 68% and 76% is achieved for soybean leaves affected by mosaic virus, septoria brown spot and pod mottle disease respectively. Average retrieval efficiency of 80% (for the top 5 retrieval) and 72% (for the top 10 retrieval) is obtained by combined features. This retrieval precision is database dependent and varies with size of the database and quality of images.

Introduction

In last few decades, vast revolution in the world of computer vision is observed because of cheaper storage devices, fast computers, novel communication technologies and multimedia. This has increased collection of images from various application areas. Image has become now an integral part of human life including commerce, government, academics, hospitals, crime prevention, surveillance, engineering, architecture, journalism, fashion and graphic design and historical research. Retrieval of required


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Abstract
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To increase the productivity in machining industries demand for better surface finish and accuracy has been increasing rapidly in recent years. Therefore, this paper focus on an effective approach for the optimization of process parameters in Minimum Quantity Lubrication (MQL) turning of AISI 4340 with nano fluid by using Grey Relational Analysis (GRA). Sixty experimental trials based on full factorial design matrix were carried on CNC turning lathe machine to optimize best level. Analysis of experimental results for response variable such as surface roughness and cutting force was performed using Grey Relational Grade (GRG). From GRA the optimal conditions are obtained as cutting speed (75 m/min), Feed (0.04 mm/rev), Depth of cut (0.5 mm) and Tool nose radius (0.8 mm) for optimal response variable surface roughness (1.26 µm) and cutting force (7.69 kgf). The Signal to Noise ratio plot for GRA shows similar optimum condition therefore the results obtained from ANOVA are closely matching to the results of GRA. Improvement in GRG is near about 4.32%. By analysing the GRG, it is observed that the cutting performance in MQL turning of AISI 4340 under MQL mode can be improved.
Keywords: MQL AISI 4340 CNC turning nano fluid Grey Relational Analysis Innovative design and manufacturing
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Prioritization of Data Using Sentiment Analysis in Calamitous Situation

Suchita M. Patil, R. P. Mirajkar, Neeta B. Patil, Sagar B. Patil

Computer Science and Engineering Dept, Bharati Vidyapeeth's College of Engineering, Kolhapur (District), Maharashtra-416013, INDIA. suchitapatil18@gmail.com, rahulmirajkar982@gmail.com, neeta6554@gmail.com, someone.sagar@gmail.com

Abstract - *As of now we know present industries and some survey companies are mainly taking decisions by data obtained from web. As we see WWW is a rich collection of data that is mainly in the form of unstructured data from which we can do analysis on those data which is collected on some situation or on a particular thing.*

In this paper, we are going to talk how modular analysis is done on the data which is collected from the Twitter using hadoop. Twitter is an online web application which contains rich amount of data that can be a structured, semi structured and un-structured data. We can collect the data from the twitter by using BIGDATA eco-system using hadoop. And doing analysis on Twitter is also difficult due to language that is used for comments. And, coming to analysis there are different types of analysis that can be done on the collected data. So here we are taking modular analysis, for this we are using hadoop tools.

In big data world, Hadoop Distributed File System (HDFS) is very popular. It provides a framework for storing data in a distributed environment and also has set of tools to retrieve and process. These data set using map-reduce concept. In this paper, a thorough work has been carried to discuss that how big data analytics can be performed on data stored on Hadoop distributed file system. Apache Pig and Hive are two projects which are layered on top of Hadoop, and provide higher-level language to use Hadoop's MapReduce library. In this paper, first of all, the basic concepts of Pig and Hive are introduced. In part II, a map-reduce job using Pig has been explained. In part III, a map-reduce job using Hive is discussed. The final section of this paper compares and concludes both techniques.

Key Words: **BIGDATA, Flume, Hive, HQL, Sentiment Analysis, Structured, Twitter, Un-Structured**

1. INTRODUCTION

Apache's Hadoop framework has become synonymous with the big data movement and is it designed to become the dominant data management platform for us all. Present situation is people completely are expressing their thoughts through online blogs, discussion forms and also some online applications like Facebook, Twitter, etc.

If we take Twitter as our example nearly 1TB of text data is generating within a week in the form of tweets. So, by this it is understand clearly how this Internet is changing the way of living and style of people. Among these tweets can be categorized by the hash value tags for which they are commenting and posting their tweets. So, now many companies and also the survey companies are using this for doing some analytics such that we can predict the success rate of their product or also we can show the different view from the data that we have collected for analysis [1].

There are different ways to get Twitter data or any other online streaming data where they want to code lines of coding to achieve this. And, also they want to perform the sentiment analysis on the stored data where it makes some complex to perform those operations. Coming to this paper we have achieved by this problem statement and solving it in BIGDATA by using Hadoop and its Eco Systems. And finally we have done sentiment analysis on the Twitter data that is stored in HDFS. So, here the processing time taken is also very less compared to the previous methods because Hadoop MapReduce and Hive are the best methods to process large amount of data in a small time [2].

2. LITERATURE REVIEW

Analysis has aroused the interest of many researches in recent year, since subjective texts are useful for many applications [3]. In particular, analysis on online reviews has become a hot research field. Survey on latest development in analysis, and makes an in-depth. Introduction on its research and application in business [4].

Our day to day life has always been influence by what people think. Ideas and opinion of others have always affected our own opinion. Effective analysis is the computational treatment of opinions, sentiments and subjectivity of text [5]. In this review we take look at the various challenges and applications of analysis.

There are different ways to get Twitter data or any other online streaming data where they want to code lines of coding to achieve this. Here the processing time taken is also very less compared to the previous methods because Hadoop Map Reduce and Hive are the best methods to process large amount of data in a small time [6].

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Privacy Preserving Multi-keyword Top-K Search based on Cosine Similarity Clustering

Sushant Y. Kamble , R. P. Mirajkar

[1]Computer Science and Engineering Dept., Bharati Vidyapeeth's College of Engineering, Kolhapur (District), Maharashtra-416012, INDIA sushantykamble@gmail.com

[2]Asst.Prof. at Computer Science and Engineering Dept., Bharati Vidyapeeth's College of Engineering, Kolhapur (District), Maharashtra-416012, INDIA rahulmirajkar982@gmail.com

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Abstract - *Cloud computing provides the facility to store and manage data remotely. The volume of information is increasing per day. The owners choose to store the sensitive data on the cloud storage. To protect the data from unauthorized accesses, the data must be uploaded in encrypted form. Due to large amount of information is stored on the cloud storage; the association between the documents is hiding when the documents are encrypted. It is necessary to design a search technique which gives the results on the basis of the similarity values of the encrypted documents. In this paper a cosine similarity clustering method is proposed to make the clusters of similar documents based on the cosine values of the document vectors. We also proposed a MRSE-CSI model used to search the documents which are in encrypted form. The proposed search technique only finds the cluster of documents with the highest similarity value instead of searching on the whole dataset. Processing the dataset on two algorithms shows that the time needed to form the clusters in the proposed method is less. When the documents in the dataset increases, the time needed to form clusters also increases. The result of the search shows that increasing the documents also increases the search time of the proposed method.*

Keywords: Cloud computing, multi-Keyword search, cosine similarity clustering, encrypted data

1. INTRODUCTION

Cloud computing becomes popular as it provides huge storage space and high quality services. The large amount of data is created per day. It is a difficult task for the owner of the data to store and manage this large amount of data. To overcome this difficulty, the data owners can store their data on the cloud server to use the on demand applications and services from shared resources [1]. The cloud server providers agreed that their cloud service is armed with strong security constraints though security and privacy are major hindrances which avoid the use of cloud computing services [2]. To protect the sensitive data on the cloud server from unauthorized users, the data owners may encrypt the documents and uploads to cloud server [3]. In the earlier various strong cryptography methods were used to design the search techniques on the cipher text [4], [5], [6]. These techniques needs many operations and require large amount of time. So these techniques are not suitable for big data where information volume is huge. The property of a document depends on its association with other documents. Therefore maintaining the relationship between documents is important to fully express a document.

The results of search returned to the users may contain damaged information due to hardware failure or storage corruption. Thus a mechanism should be given to users to check the accuracy of the search results.

The proposed architecture of search technique is based on the cosine similarity clustering which maintain the association between plain text and encrypted text to improve the efficiency of search.

2. LITERATURE REVIEW

Chi Chen and Xiaojie Zhu [7] used a hierarchical clustering method to maintain the close relationship between plain documents and encrypted documents to increase search efficiency within a big data environment. They also used a coordinate matching technique [8] to measure the relevance score between query and document. They did a model for the efficient multi-keyword ranked search and maintain the privacy of documents, rank security and relevance between retrieved documents.

Jiadi Yu and Peng Lu [9] focused on the problems of the cipher text search using Searchable Symmetric Encryption (SSE) [10], [11]. This SSE technique helps data users to retrieve the documents over the encrypted documents. In Two Round Searchable Encryption (TRSE), they used the similarity relevance concept to solve the privacy issues in searchable encryption. They also showed server side ranking according to order preserving encryption (OPE).

N. Cao, C. Wang and M. Li [12] used "inner product similarity" concept which can find the similarity measure of the information and the keywords of search.

Ruksana Akter, Yoojin Chung [13] defined an evolutionary approach based on cosine similarity clustering. A document vector is used to create the index of every document. The cosine values between the document vectors are calculated. Clusters of the most relevant documents are formed on the basis of the cosine values. Another good feature of their work is that they do not require

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A Method for Detection and Reduction of Stress using EEG

Ms. Neeta Baliram Patil[1], Mr. Rahul P. Mirajkar[2], Ms. Suchita Patil[3], Ms. Pratibha Patil[4]

[1]*Student, Department of Computer Science and Engineering, Bharati Vidypeeth's College of Engineering, Kolhapur, Maharashtra, India*

[2]*Assistant Professor, Department of Computer Science and Engineering, Bharati Vidypeeth's College of Engineering, Kolhapur, Maharashtra, India*

[3]*Student, Department of Computer Science and Engineering, Bharati Vidypeeth's College of Engineering, Kolhapur, Maharashtra, India*

[4]*Student, Department of Computer Science and Engineering, Bharati Vidypeeth's College of Engineering, Kolhapur, Maharashtra, India*

Abstract - *World health organization says that, nowadays people mental health problems and also physical problems are because of stress. This stress is major problem of our times. There are many stress detection methods are available. To study the human behavior there are many techniques are available which monitors the human brain. However, there is less research available on reduction of stress methods in terms of technology but studies are available on stress detection methods. This research proposes a method that uses the EEG signals for detecting the stress in humans and introduces the stress reduction techniques by adding interventions into the method. K-means clustering method used in the research to measure the stress which help in dividing the subjects into different classes and detect the stress level. Product for human stress reduction can be developed by using this method. The success of implementation and development of this research expected to help in reducing time consumed and human power in determining best recommendation and solution for stress management.*

Key Words: **Stress, Electroencephalography, Stress measurement, Monitoring.**

1. INTRODUCTION

Stress is a body's method for reacting to a challenge. Human stress can have an impact on a person's mental and physical well - being. Stress can lead to a change in behavior and in physiology. Many people suffer from stress in everyday life. Stress is related to human work in one way or other. Originates of stress have different sources such as time pressure while working in company, responsibility, economic problem or physical factors such as noise. Signs of stress are human fell tension, anxious, angry, frustrated or irritated by things over which he has no control.

Stress detection is an on-going research topic among both psychologists and engineers. Wearable sensors and bio signal processing technologies are developed for detecting the human stress. There are various bio signal processing technologies use for human stress detection such as Electroencephalography (EEG), Electrocardiography (ECG), Electromyography (EMG), Blood Pressure (BP), Blood Volume Pulses (BVP), Galvanic Skin Resistance (GSR), Respiration and Skin Temperature (ST) etc. Also to measure the stress level human physiological features are used for that human physiological signal processing technology is used. There is difference between Individuals physiological features. Person physiological features are changes when he/she response to stressful events. By considering various physiological features occur in human while he/she is in stress the estimation of stress are done by using cluster based analysis method [1].

In proposed method EEG stress detection technology is used. EEG is one of the most reliable sources to record electrical activity of the brain along the scalp. To measure the voltage fluctuation resulting from ionic current within the neurons of the brain EEG is used. To diagnose the epilepsy, coma, sleep disorders, encephalopathy and brain death EEG is most often used. EEG is used as first line method to identify stroke, focal brain disorder, and tumors. Hardware cost of EEG is significantly lower than other techniques. Near the patient's bed patient bio signals can be recorded by using EEG also EEG can monitor long term sleep stages or epilepsy; this is the reason why EEG is most preferable. Compare to other technique, EEG is most superior choice because it is convenient tool for physiological research. When subject perform some behavioral or it is out of laboratory EEG can be used as wearable sensor. EEG can track brain changes during different phases of life without disturbing a patient for e.g. EEG sleep analysis.

2. LITERATURE SURVEY

A literature review conducted over analysis of stress using physiological signals and evaluation of stress level.

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Privacy Preserving Data Mining Using Inverse Frequent ItemSet Mining Approach

Ms. Ashwini S. Chavan[1], Prof. Rahul P. Mirajkar[2]

[1]*Student, Department of Computer Science and Engineering, Bharati Vidyapeeth's College of Engineering, Kolhapur, Maharashtra, India*

[2]*Assistant Professor, Department of Computer Science and Engineering, Bharati Vidyapeeth's College of Engineering, Kolhapur, Maharashtra, India*

Abstract - *The paper presents architecture for protection of information against third party attack. Individual sensitive information is in danger with increasing technologies of data mining. A new research data mining topic, known as privacy-preserving data mining (PPDM), has been tremendously studied in recent years. Privacy preserving data mining (PPDM) aims to maintain privacy of individual data or sensitive information without sacrificing the utility of the data. Currently, privacy preserving data mining (PPDM) mainly consciousness on a way to reduce the privacy threat delivered by way of data mining operations, even as in truth, unwanted disclosure of sensitive information may manifest in the system of data collecting, data publishing, and information (i.e. The data mining effects) delivering. To this effect, paper proposes a technique called inverse frequent itemset mining approach that will help to protect sensitive information without loss of data.*

***Key words*: Data mining, sensitive information, privacy preserving data mining (PPDM), inverse frequent itemset mining, protection.**

1. INTRODUCTION

Mining of data is the process of discovering interesting patterns and knowledge from large amounts of data [1]. The information collected by data mining can be very important to many applications, despite that there is another concern on focus of the privacy threats posed by data mining [2]. To address the privacy troubles in data mining, Privacy preserving data mining (PPDM) has received a top notch improvement in latest years[3][4]. The objective of PPDM is to safeguard sensitive information against the disclosure of data by maintaining its utility.

The PPDM Consideration is two-fold. First, sensitive raw data e.g. individual's ID card number, cell phone number should not be directly used for mining. Second, sensitive mining results whose disclosure will cause privacy violation should be excluded.

In PPDM process four different types of users are involved namely data provider, data collector, and data miner and decision maker. Each one has their specific role in the process. A data provider owns a few data from which precious information can be extracted. Data collector gets data from data providers so as to support the subsequent data mining operations. In order to invent useful knowledge which is expected by the decision maker, the data miner applies data mining algorithms to data obtained from data collector. A decision maker can get the data mining results directly from the data miner, or from some Information Transmitter. The focus of this topic is to achieve privacy at data miner level. *Data miner* will get data to mine from data collector to be able to in not unique layout and by means of applying one-of-a-kind data mining strategies; data miner can discover sensitive information. So venture of data miner is to hold the privacy of received result and pass the consequences to decision maker that doesn't bring about any security breach. Several studies on PPDM have been conducted [5] [6]. But none of the modern-day proposals provide privacy to unwanted disclosure of sensitive information. The paper presents a system architecture that provides privacy by the use data mining algorithms without affecting the security of sensitive information contained in the data.

2. LITERATURE SURVEY

Several theoretical approaches for privacy preserving of data have been proposed in the literature.

2.1 Related Research

B. Fung, K. Wang, R. Chen, and P. S. Yu et al [6] introduced techniques to protect the data. Data in its original form have sensitive information about person, and publishing such data will violate individual privacy. *Privacy-preserving data publishing* (PPDP) explains methods and tools for publishing useful information while preserving data privacy. The author introduces different schemes to PPDP, study the challenges in practical data publishing, and clarify the differences and requirements that distinguish PPDP from other related problems.

T. Mielikainen [7] introduces a well known technique called frequent set mining to describe binary data. However, it is an open problem how difficult it is to make opposite the frequent set mining. The author analyze the computational complexity of the problem of

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Partitioning of Query Processing in Distributed Database System to Improve Throughput.

Ms. Pratibha B. Patil[1] , Mr. Rahul P. Mirajkar[2], Ms.Neeta B. Patil[3]

[1]*Student, Department of Computer Science and Engineering, Bharati Vidyapeeth's College of Engineering, Kolhapur, Maharashtra, India*

[2]*Assistant Professor, Department of Computer Science and Engineering, Bharati Vidyapeeth's College of Engineering, Kolhapur, Maharashtra, India*

[3]*Student, Department of Computer Science and Engineering, Bharati Vidyapeeth's College of Engineering, Kolhapur, Maharashtra, India*

Abstract - *Query processing in distributed system calls for the transmission of records among computers in community. The arrangement of statistics transmission and local information processing is known as distribution strategy for a query. Two cost measures reaction time and total time are used to judge the great of distribution method. Numerous algorithms are used that derive distribution strategies that have minimal reaction time and minimum overall time. The optimal algorithms are used as a foundation to increase a general query processing algorithms. In this article, we introduce using graph partitioning to partition the task of query to optimize the throughput on distributed structures. New heuristic set of rules we've advanced, the congestion avoidance partitioning (CA) algorithm to optimize the throughput and query execution (parallel) algorithm developed for concurrent execution of query in distributed database system. We evaluate the query processing device with and without partitioning algorithm to analyze throughput end result.*

Key Words: **Computer Network, Distributed database, query processing, graph partitioning, concurrent execution.**

1. INTRODUCTION

In recent years, with the development of computer network and database technology, dispensed database is more and more extensively used; with the increasing application, facts queries are increasingly more complicated, the performance requests are an increasing number of excessive, so query processing is a key trouble of the dispensed database device.

In a distributed database surroundings, data stored at exclusive sites linked through community. A distributed database management system (DDBMS) aid advent and maintenance of disbursed database. The studies literature proposes a huge form of query optimization algorithms and overviews on diverse query optimization techniques for distributed database management system[5,6,7]. However, these overviews do no longer try and increase a model of query optimization that explains and gives the algorithms in a uniform manner. This knowledge in case we want to exchange or enlarge current algorithms to conform them to new necessities. In this research we take into account query processing algorithms for an allotted Database machine.

To gain good performance for query processing on parallel structures with shared reminiscence, above mentioned initiatives have deployed sever scheduling strategies. The primary trend is to maximize the parallelism among all cores by way of mapping computational nodes of the queries into individual cores. Special graph partitioning strategies have been taken on to provide load stability so far both regardless the communication value or bear in mind it simplest with a low priority[1,2,3].

On distributed structures in which communication cost has an large effect on performance, those strategies are now not appropriate. In this paper, we advocate a

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Mining Users Rare Sequential Topic Patterns from Tweets based on Topic Extraction

Bhakti Patil[1], Sachin Takmare[2], Rahul Mirajkar[3], Pramod Kharade[4]

[1]Student, Dept. of Computer Science & Engineering, Bharati Vidyapeeth's College of Engg. Kolhapur, Maharashtra, India.

[2,3,4]Professor, Dept. of Computer Science & Engineering, Bharati Vidyapeeth's College of Engg. Kolhapur, Maharashtra, India.

Abstract - *Twitter is an online news and social networking service where users post and interact with messages, "tweets" spontaneously. Most of the existing works are dedicated to discovering the abstract "topics" that occur in a collection of documents and creation of discrete topic. It means when a specific user publishes successive documents then successive relation between topics is totally ignored. In this paper, a different approach for detecting users' Sequential Topic Patterns is proposed which consequentially characterizes and detects personalized and abnormal behaviors of users and then we prepare the problem of Mining Users Rare Sequential Topic Patterns(URSTP) from Tweets. URSTPs are rare for all users but relatively frequent for some specific users, so this approach can be applied in many real-life scenarios, such as real-time monitoring an abnormal user behaviors. We present a group of algorithms to solve such innovative mining problem using different phases such as preprocessing to extract probabilistic topics, identifying sessions for different users, generating all the STP candidates and selecting URSTPs by making user-aware rarity analysis on derived STPs. Experiment show that our approach can significant to find special users and interpretable URSTPs, which significantly indicate users' characteristics.*

Key Words: **Sequential topics, Web mining, Topic Extraction, Keyword Extraction, frequent patterns, clustering.**

1. INTRODUCTION

Social networking service such as facebook, Twitter, LinkedIn creates an environment where user could spend a lot of time on it and use it for different purposes. Based on this interaction between users, we have a huge amount of data for each individual user. Documents of such services focus on some particular topic. Topic provides users characteristics. Text mining is one and only way to mine the piece of information for extracting topics. Generally some probabilistic topic models such as LDA [1], classical PLSI[5] and their extensions[3],[4],[6],[7],[8],[9] are used for topic extraction.

In the literature most of the researchers concentrates on adaptation of single topic to identify and imagine social events and user behaviors [10], [11], [12]. Some researchers studied relation between the different topics of successive documents published by same user successively where some hidden but important information behaviors has been neglected which uncovers personalized behaviors of that user.

In this paper we mainly concentrates on relation mainly between the extracted sequential topics refer them as Sequential Topic Patterns (STP) that indirectly reflects user behaviors. For a document stream some STPs may occur frequently and so it reflects common behaviors of involved users. But away from that, there may still exists some other patterns which are infrequent for the general population, but occur relatively frequent for some specific user or some specific group of users. We refer them User-aware Rare STPs (URSTPs). Compared to frequent patterns, discovering rare patterns is interesting and important. Basically, it formulates a new problem for rare event mining, so that it is possible to characterize personalized and abnormal behaviors for special users' behavior.

In our case STPs can characterize complete browsing behaviors of readers. Then compared with statistical methods, mining URSTPs can better to find special interests and browsing habits of users, and is thus capable to give effective and context-aware recommendation for them. Our approach will concentrate on published document streams.

Solving such important problem of mining URSTPs in document streams, new technical provocations are raised and will be solved in this paper. First, the input of the approach is a text stream, so existing techniques of probabilistic databases cannot be directly applied to solve this problem. A preprocessing phase is required and important thing to get conceptual and probabilistic descriptions of documents by topic extraction, and then to identify complete and repeated liveliness of users by session identification. Second, in case of the real-time requirements in many applications, both the precision and the effectiveness of mining algorithms are important, especially for the probability computation process. Third, unlike from frequent patterns, the user aware rare pattern can effectively characterize most of personalized and abnormal behaviors of users and can applied to different application scenarios. And correspondingly, unsupervised mining algorithms for

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Community Wastewater Treatment By Using Vermifiltration Technique

Author 1
Nandini Misal
Assistant Professor,Department of Civil Engineering,D.Y .Patil College of Engineering and Technology, KanabaBavada,Kolhapur

Author 2
Mr.NitishA.Mohite
Assistant Professor,Department of Civil Engineering,D.Y .Patil College of Engineering and Technology, KanabaBavada,Kolhapur

Abstract
Now-a-days many developing countries cannot afford the wastewater treatment processes as they are costly,need more space to construct the treatment plant and in addition use of chemicals for the treatment.They need some more options at low cost,space saving and ecofriendly techniques.Vermifiltration is one of the simple,low cost,ecofriendly,chemical free technique used to treat the canteen wastewater using the Eisenia fetida earthworm species.The earthworms are potentially capable of digesting the waste organic material and reduce it through ingestion.It is considered to be an innovative ecofriendly technology that provides a sustainable solution for the treatment of wastewater with no sludge generation and treatment.

Key Words: Earthworms,Eisenia fetida,Biochemical Oxygen Demand(BOD),Chemical Oxygen Demand(COD),Total Solids(TS),Total Suspended Solids(TSS),Total Dissolved Solids(TDS),Waste Water(WW).

Introduction

Wastewater is any water that has been adversely affected in the physical,chemical and biological characteristics.It may get generated from a combination of domestic,industrial,commercial or agricultural activities,surface runoff or storm water and from sewer inflow or infiltration.Large quantity of the water about 85-90% used by the society flows as a wastewater in the sewerage system as sewage.Their are various treatment processes used to treat the wastewater but are expensive,time consuming,space consuming and include usage of chemicals.To overcome this,a new low cost,ecofriendly technique has been introduced in the developing countries.

Vermifiltration technique is a new approach towards wastewater treatment to save cost,energy and eliminate chemical usage.Unlike conventional water treatment amenity,vermifilter uses no chemicals,the system is all natural.We have tried to develop a sustainable and environmental friendly technology for the treatment of College Canteen wastewater at low cost.

The vermifilter is made up of simple filtering system made up of plastic container.The bottom layer is made up of gravels with space for aeration and water percolation,covered with a layer of aggregate then sand and sand boulders,covered with cowdung,clay and loaded with vermis-Eisenia fetida earthworms.

The wastewater is allowed to pass through the filter,the earthworms consume and metabolise oils,fats and other compounds.The water percolating through is collected in another container.Earlier report of Sinha et.al(2008) have proved that the body of earthworms works as a "biofilter"and the body walls absorbs the solids from wastewater.It has been observed that the earthworms are potentially capable of digesting the waste organic material and remove the 5days BOD_5 near about 90%,COD by 85-90%, TS by 90-95%,TDS by 95%,TSS by 95-98%.

The results have proved that earthworms appear promising to provide cheaper solutions to environmental problems as their baby works as biofilter and hence can reduce BOD,COD,TS,TDS,TSS,Oil and grease of wastewater significantly.

Materials And Methodology

The Wastewater sample was collected from our College canteen.Eisenia fetida earthworm species were used in the study.The study was carried out in a vermifiltration kit made up of plastic having 20lit capacity.The kit contains a layer of aggregates of 20mm size of 7cms with layer of 10-16mm size of 7cms and 5mm size of 7cms aggregates above which 5cms layer of sand and sand boulders with layer of cowdung,clay of 10cms with vermis on the top.The WW was allowed to pass through beds of Vermifilter at a maintained velocity.

Fig 1- Earthworms used in vermifilter

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