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STUDIES ON RELATIONSHIP BETWEEN COMPRESSIVE AND SPLITTING TENSILE STRENGTH OF HIGH PERFORMANCE CONCRETE

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ABSTRACT

This experimental study is intended to identify the relationship between compressive strength and splitting tensile strength of high performance concrete. For this purpose the applicability of existing relationship between the Compressive strength and Splitting tensile strength of Concrete was examined. The commonly accepted 0.5 power relationship as per IS 456-2000 was investigated and then a similar kind of relationship developed for High performance Concrete. M60 grade HPC mixes incorporating different percentages of high reactivity metakaolin and silica fume by weight of cement along with some suitable super plasticizer. The results of the study indicate that the strength properties of HPC mixes improved by incorporating metakaolin and silica fume up to a desirable content of 15% and 5% respectively by weight of cement. It was analyzed from the test result that the Compressive strength and splitting tensile Strength were related together and the 0.5 power relationship was found to be inaccurate. Thus the alternative relations were proposed for the High performance Concrete with the support of results and figures.

Key words: high performance concrete, fly ash, metakaolin, tensile strength, compressive strength, silica fume.

1. INTRODUCTION

The global warming is caused by emission of green house gases such as carbon dioxide, carbon monoxide into the atmosphere (Elahi, A. *et al* 2010). In terms of global warming the High performance technology could significantly reduce the carbon dioxide emission into the atmosphere caused by cement industries. The IS 456-2000 code represents the relationship between the concrete flexural tensile strength (f_t) and the Compressive strength (f_{ck}) by $f_t = 0.7(f_{ck})^{0.5}$. The American concrete Institute code ACI 318-95⁴ defines the relationship between modulus of rupture (ζ) and the Compressive strength (f_{ck}) by $\zeta = 0.56(f_{ck})^{0.5}$ and also recommends the relationship between the modulus of rupture f_r and the Compressive strength (f_{ck}) by $f_r = 0.62(f_{ck})^{0.5}$. The Canadian code 1994 defines only one value for the modulus of rupture up to the concrete strength of 80Mpa, namely, $f_r = 0.6(f_{ck})^{0.5}$. It has been accepted by the Concrete researchers as well as the ACI that the 0.5 power relationship exists between the tensile strength and Compressive strength of Concrete. Investigations have also conducted for finding the applicability of this 0.5 power relationship to High performance Concrete. In order

Splitting tensile strength is not necessarily proportional to the 0.5 power of Compressive strength and predicted that the tensile strength is proportional to 0.79 power of cylinder Compressive strength.

2. EXPERIMENTAL PROGRAMME

2.1 Materials used

The materials used for making high performance concrete specimens are low calcium fly ash as the source material, River sand, coarse aggregate as the filler, and water and super plasticizer as workability measure. In this investigation, class F type of fly ash is obtained from Metur power plant with fineness modulus and specific gravity were 7.86 and 2.21, respectively.

The fineness modulus and specific gravity of river sand were 3.12 and 2.64.

2.2 Metakaolin

Sabir B.B. *et al.*, 2001 suggested that Metakaolin is compatible with most concrete admixtures, such as super plasticizers, retarders, accelerators, etc. Based on previous experience, replacing 10-15% of the cement with Metakaolin gives us an optimal performance.

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January 2015

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Jagadeesan Ponnupaiyan
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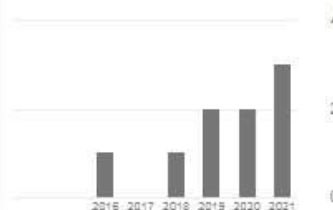
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Strengthening of brick masonry using basalt fiber reinforced cement mortar

January 2015

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Abstract

Brick masonry is one of the primary structures and it plays a role in Reinforced Concrete (RC) frame structure. It is very weak in tension and has low ductility response. Normally in brick masonry, cement mortar reaches failure before brick attains the failure. For strengthening the brick masonry, it is essential to increase the strength of the cement mortar. Basalt fiber is added with cement mortar in different proportions as 0.5%, 1% and 1.5% of weight of cement. Compressive strength and Young's modulus of brick masonry were tested with and without of basalt fiber in cement mortar. Similarly, cube compressive strength of cement mortar was also tested in the same manner. The experimental results show that 1% of basalt fiber in the cement mortar gives the optimum value of properties of the brick masonry.

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Effluent Treatment of Sago Waste Water by Using Natural Coagulants

January 2017

Project: Effluent Treatment of Sago Waste Water by Using Natural Coagulants

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Abstract and Figures

One of the most important treatment processes in raw water treatment plant is coagulation. Waste water contains suspended solids and turbidity. With the help of coagulants, and by flocculation process, followed by sedimentation and filtration, these impurities can be removed from raw water, besides conventional chemicals such as Alum, Ferric chloride and Poly Aluminum Chloride. These chemicals are used for the purpose of pretreatment of water. There are some disadvantages related to the use of such chemicals as their residues present in the waste water may cause the health hazards. In this research, the preliminary investigation was carried out for the possible use of oil cakes as natural coagulants for the treatment of sago effluent. The quality of the treated raw water were analyzed and compared with each other. The experiments were conducted for various dosages of the crude extracts of the cotton seed and castor oil cakes using flocculate. The optimum dosage of these natural coagulants was identified. Various parameters of quality of the waste water were measured before and after the treatment to evaluate the removal efficiency on the major pollutants of concern in waste water treatment such as pH, Total Solids (TS), Total Dissolved Solids (TDS), sulphates, chlorides, Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD) etc.,. Results showed that the use of cotton seed oil cake was more efficient for the treatment of the sago effluent when compared to the castor oil cake. The alkalinity, sulphates and Total Suspended Solids of sago effluent after treated with the cotton seed oil cake were highly reduced. Hence, the use of cotton seed oil cake can be adopted as a natural coagulant for purification of the sago effluent.



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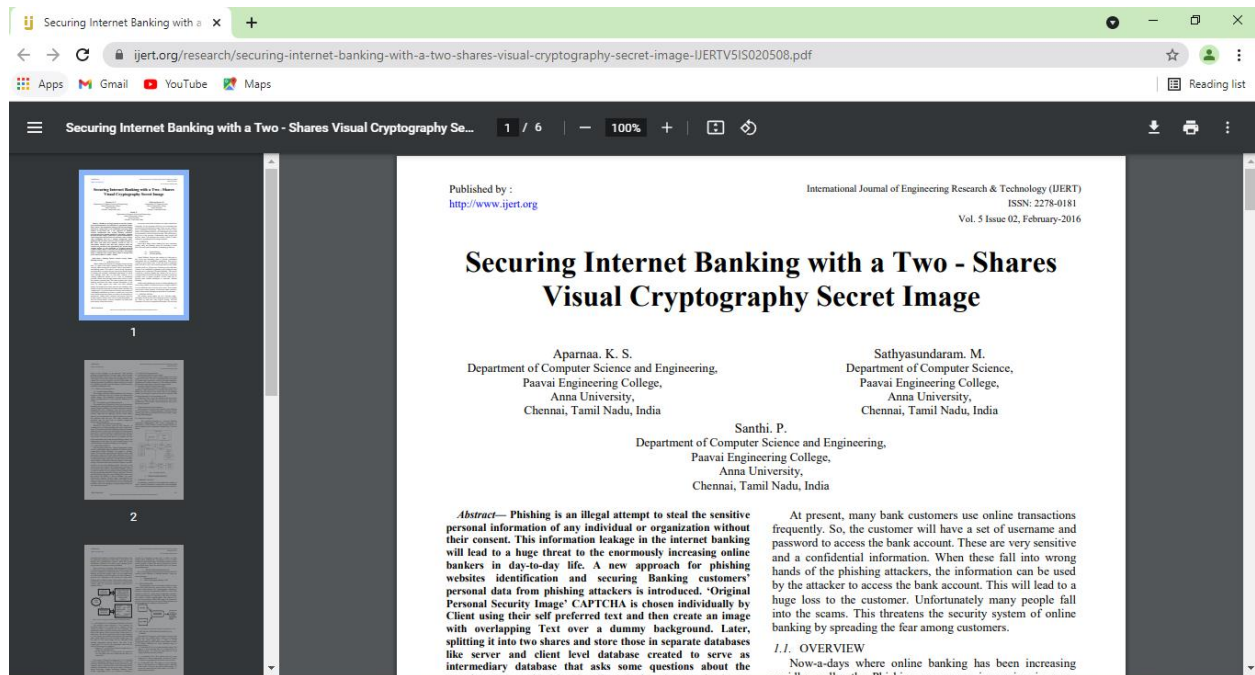
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A Systematic Big Data Study Using HDFS and Map Reduce

S.Lavanya¹, N.R.Vikram², M.Revathi³
Assistant Professor, CSE, Paavai Engineering College, Namakkal, India

Abstract— In modern beings, big data plays a vital role in processing/analyzing a large set of datasets. Similar to data mining, big data analytics provide an insight to uncover hidden patterns and useful information, in order to make better decisions. There are various techniques available to perform big data analytics. This paper provides a vision on big data, Hadoop, components of HDFS and working of MapReduce framework. It also offers creation and execution of MapReduce program in Java.

Index Terms— Big data, Map reduce, Hadoop

1. INTRODUCTION

What is Big Data?
Big Data is a data that exceeds the processing capacity of conventional database systems. The data is too big, moves too fast, or doesn't fit the structures of your database architectures.
Big Data is a common buzzword in the world of IT nowadays and it describes the realization of greater business

(and even Exabyte's) of data every hour of every day of the year.

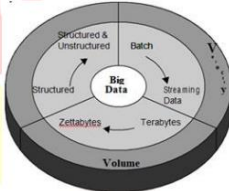



Fig 1 Volume of Big Data

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1. INTRODUCTION

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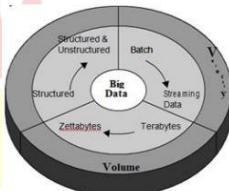
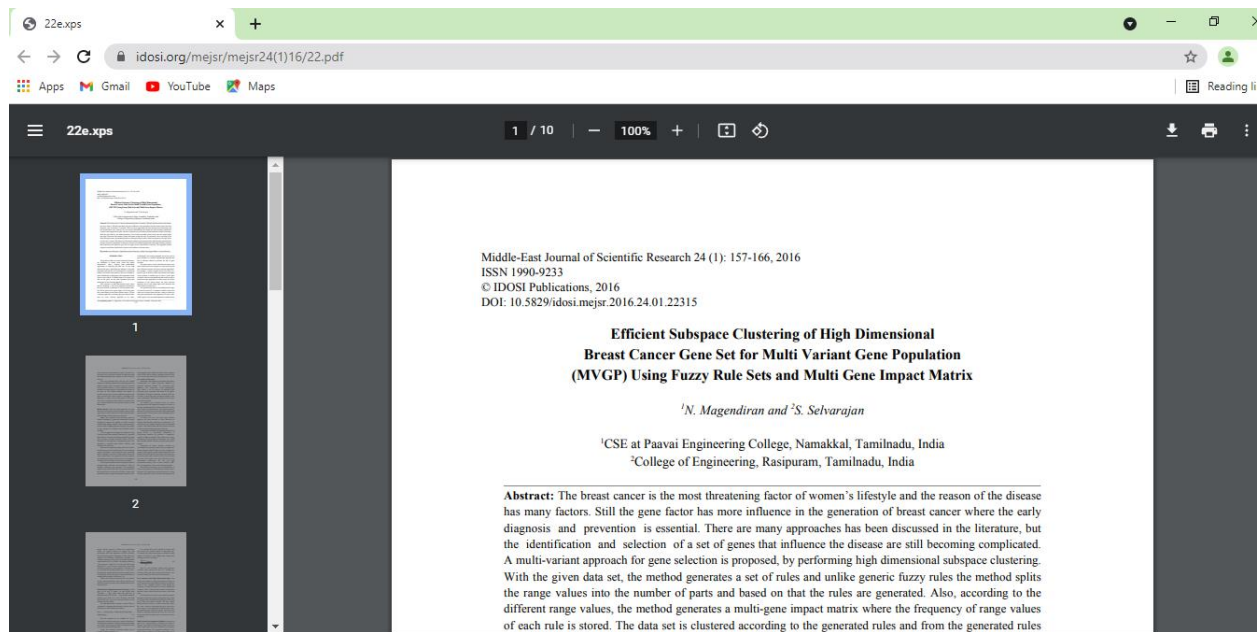
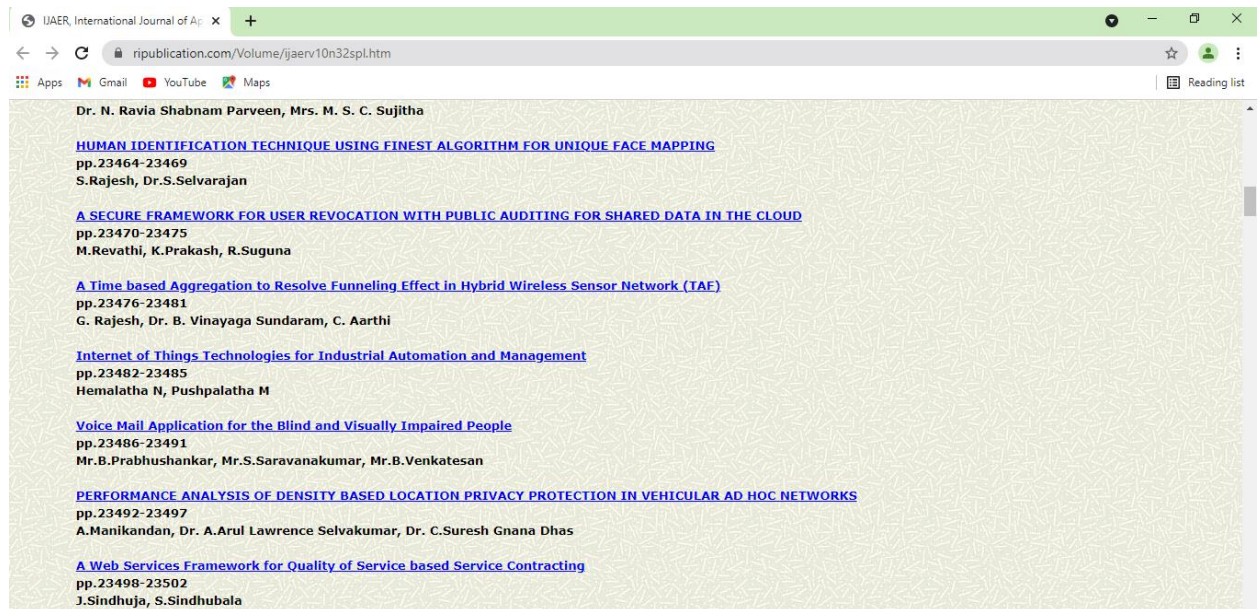
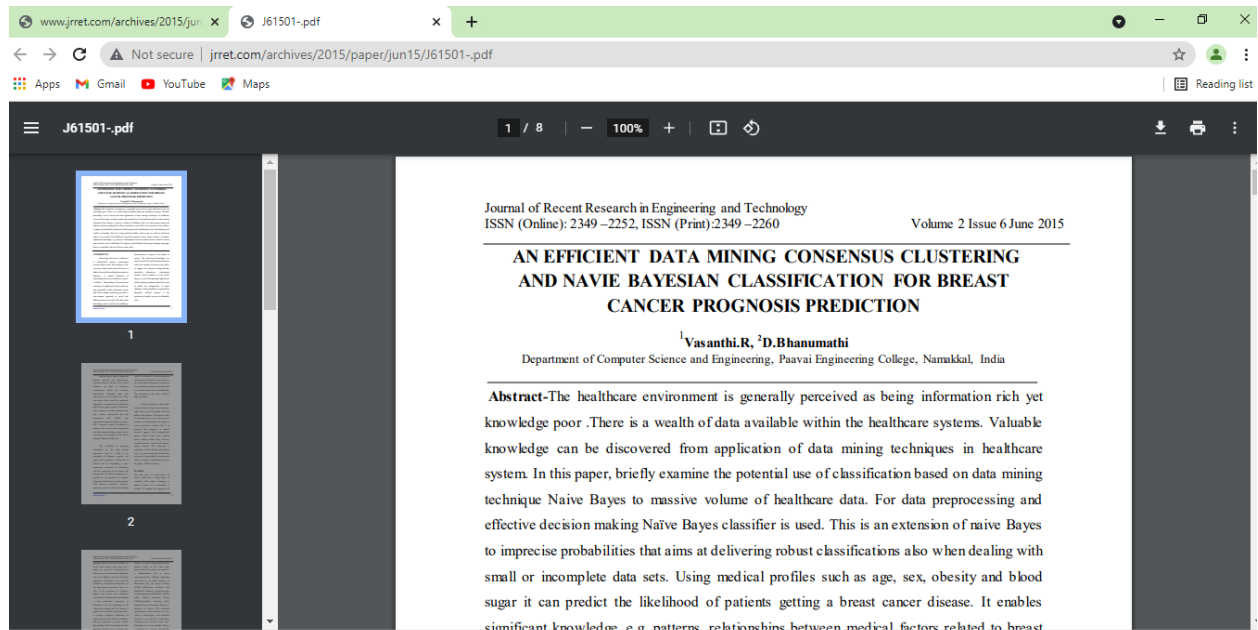


Fig 1 Volume of Big Data






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An Optimized User Behavior Prediction Model Using Genetic Algorithm on Mobile Web Structure

M. I. Thariq Hussan, Dr. B. Kalaavathi, Vol. 9, No. 5, May 30, 2015


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ABSTRACT

With the advancement of mobile web environments, identification and analysis of the user behavior play a significant role and remains a challenging task to implement with variations observed in the model. This paper presents an efficient method for mining optimized user behavior prediction model using genetic algorithm on mobile web structure. The framework of optimized user behavior prediction model integrates the temporary and permanent register information and is stored immediately in the form of integrated logs which have higher precision and minimize the time for determining user behavior. Then by applying the temporal characteristics, suitable time interval table is obtained by segmenting the logs. The suitable time interval table that split the huge data logs is obtained using genetic algorithm. Existing cluster based temporal mobile sequential arrangement

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Research article

ESTIMATION OF ACCURACY LEVELS USING MULTILEVEL CONDITIONAL PROBABILITY BOOTH MULTIPLIER

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ABSTRACT: This paper determines about reducing truncation error that enters into fixed width Booth multiplier designs. Fixed width booth multiplier compensates for the Stop error with Multi-level conditional probability Value. The proposed multilevel conditional probability uses all non-zero code to estimate the truncation error and to achieve higher Accuracy levels. Further, the simple and small multilevel conditional probability compensated circuit is proposed. To achieve the proposed multilevel conditional probability booth multipliers low cost high accuracy performance.

1. INTRODUCTION

Multiplication is one of the most consuming field arithmetic operations in high performance circuits. Fixed width multiplier takes n number of inputs and n is the number of outputs produced. Combination of fixed multiplier and multiplier Post stump, cuts half of the LSB produces the result after reduction of the product and then shift multiplication number, the treated both positive and negative number uniform. It multiplies two signed binary numbers in two's complement. Booth multiplication is a technique that allows small, fast multiplying circuits, the numbers multiplied by transcoding. It is used the standard methods in chip design, and offers significant improvements over the "long multiplication"



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A MULTI-CLASSIFIERS-BASED APPROACH FOR PLUMB HANDOFF PROCESS IN WIRELESS DIVERSE NETWORKS: EXPOSITION AND PROBABLE

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Abstract: Heterogeneous networks allow mobile nodes to take advantage of best radio facilities for their coexisting application, access cost, transmit power, and the user's preferences.

vertical handoff (VHO) decision making is required to perform Always Best Connected (ABC). VHO is one of the most challenging research issues for wireless networks. The traditional decision making schemes cannot meet the VHO requirements of mobile networks, and the performance may degrade severely due to the unique characteristics of mobile networking. Therefore, optimized handover management schemes, developed specifically for heterogeneous wireless networks are required. In order to achieve an optimum VHO decision, this paper proposes a solution to the tough VHO decision problem through a novel approach based on multiple classifiers application. Our aim is to survey recent development of this field and to present the prospective of utilizing statistical classifiers to handle the challenging VHO requirement. The architecture design of the proposed approach is presented. Various components that constitute the road map toward development of the multiclassifier based VHO scheme are discussed.

Key Words: Network Selection, Vertical handover
Heterogeneous network, MADM.

During the vertical handoff execution phase, the connections in the mobile terminal are re-routed from the existing network to the new network in a seamless manner. This phase also includes the authentication, authorization, and transfer of a user's context information.

Various vertical handoff decision algorithms have been proposed recently. In [6], the vertical handoff decision is formulated as a fuzzy multiple attribute decision making problem. Two ranking methods are proposed: Simple Additive Weighting (SAW) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). In [7], the network selection for vertical handoff is modeled by the Analytic Hierarchy Process (AHP) and the Grey Relational Analysis (GRA). In [8], a performance comparison among SAW, TOPSIS, GRA, and the Multiplicative Exponent Weighting (MEW) for vertical handoff decision is presented. In [4], the handoff decision mechanism is formulated as an optimization problem. Each candidate network is associated with a cost function which depends on a number of criteria.

1. INTRODUCTION

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ENDOCARDIUM SEGMENTATION: AN APPROACH USING LOCAL CHAN VESE MODEL WITH RADIAL CHARGE FITTING CURVE

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Abstract
Wall tracking and Endocardium segmentation in Echocardiography images is a prime requirement for the diagnosis of major cardiac diseases. To avoid manual procedures of wall tracing and to provide a quantitative aid in the diagnosis procedure to the cardiologist, a new approach based on Local Chan Vese Model is proposed. The Model is based on curve evolution, local statistical function and level set method, and the accuracy of result is based on contour placement. This initial contour is generated through Radial Charge Fitting curve which is an auto generated curve based on Gauss Law. It is found that the inclusion of Radial Charge Fitting Curve with Local Chan Vese Model provides an accurate Endocardium Segmentation. The proposed method is compared with the Local Chan Vese Model with manual initial contours. It is proved that the proposed Local Chan Vese Model with Radial Charge Fitting Curve is performing accurate Endocardium Segmentation with minimal iterations.

Keywords:
Endocardium, Segmentation, Local Chan Vese Model, Initial Contour, Gauss Law, Electric Field Intensity

1. INTRODUCTION

Endocardium segmentation is an essential step in the diagnosis of cardiac diseases, as it is to picture the geometry of the chambers of the heart. Especially the geometry of left ventricle plays a major role in analyzing Left Ventricular Hypertrophy and its associated diseases. This endocardium

image was the main parameter in edge based level set methods [3]. These methods are suitable only for detecting the objects whose edges are defined by gradient. This may lead the evolving curve to pass through the true boundaries.

A general image segmentation model was proposed by Mumford and Shah [4]. In this model, the image is divided into partitions. In each partition, the original image is approximated by a smoothing function. An optimal segmentation is obtained by minimizing the Mumford Shah functional. This functional was later effectively minimized and solved by Chan and Vese by using Level set functions [5]. The authors utilized global region information into the Mumford Shah functional for providing a strong stabilization to topological variations. This Chan Vese model proved to be an effective segmentation as it used global image statistics and level set function. The initial Chan Vese model suffered from certain limitations. It provides poor image segmentation for intensity inhomogeneity images. It becomes time consuming if periodical re-initialization step is adopted. The most important limitation is the placement of initial contour in the image to be segmented. The segmentation results may vary and increase the computational load based on the initial contour position.

Many researches have been carried out to solve the limitations of Chan Vese Model. This has provided a gateway for multiphase level set formulation proposed by Chan and Vese [6]. This has involved computational complexity and required the placement of initial contour near the boundary. Models have

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Automated Endo Fitting Curve for Initialization of Segmentation Based on Chan Vese Model

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The placement of initial contour plays an important role in the segmentation using Chan Vese Model. This initial contour is a factor determining the computational complexity of the segmentation procedure. This work aims at framing the initial curve to aid the performance of Chan Vese Model. Two methods namely straight charge fitting curve and radial charge fitting curve are proposed to develop the initial contour called the 'Endo Fitting Curve' with the application of electrostatic field and Gauss law. The proposed curve works well for intensity inhomogeneity images and it is demonstrated on 2D Echocardiography images. The Endo Fitting Curves are developed within 0.1 to 0.2 seconds and can be better tuned using Local Chan Vese Model. This contour acts as a pre-segmentation procedure to reduce the computational cost and to incorporate automated segmentation. Comparisons are made with other initial contours used for Chan Vese Model and other active contour models and the obtained results are illustrated.

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학술지널

Reduction of Components in New Family of Diode Clamp Multilevel Inverter Ordeal to Induction Motor




Rathinam Angamuthu (Paavai Engineering College) , Karthikeyan Thangavelu (M. Kumarasamy college of Engineering) , Ramani Kannan (K.S.Rangasamy College of Technology)
대한전자공학회 | JOURNAL OF SEMICONDUCTOR TECHNOLOGY AND SCIENCE |
Journal of Semiconductor Technology and Science Vol.16 No.1
2016.02 | 58 - 69 (12 pages)

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초록·키워드 **목차**

This paper describes the design and implementation of a new diode clamped multilevel inverter for variable frequency drive. The diode clamp multilevel inverter has been widely used for low power, high voltage applications due to its superior

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Theoretical Study and Estimation of Recombination Rate and Photocurrent of Quantum Dot Solar Cell using Homotopy Analysis

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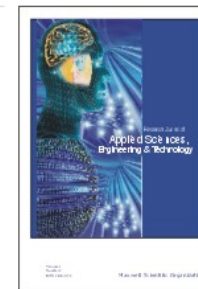
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Received: June 20, 2014 | Accepted: July 13, 2014 | Published: March 15, 2015

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Abstract

The objective of this study is to develop the numerical model of InGaAs QD solar cell to describe the device characteristics. The developed model is based on Homotopy analysis which provides self-consistent and nonlinear solutions to 3D Poisson and Schrodinger equations. The exact potential and energy profile of the



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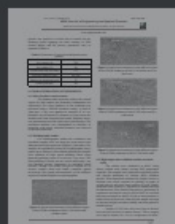
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HIGH TEMPERATURE OXIDATION AND HOT CORROSION BEHAVIOUR OF PLASMA SPRAYED YSZ COATING ON SA213 T92 STEEL IN AIR AND SALT AT 900°C UNDER CYCLIC CONDITION

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²AMS Engineering College, Namakkal, India

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ABSTRACT

Oxidation and hot corrosion has been considered as the principal destructive factors in thermal barrier coating systems during service. Thermal barrier coatings (TBCs) are extensively used to protect turbine blades against high temperature oxidation and corrosion. At the present time, problems of component materials reliability in power plant focus on assessing the potential behavior of coatings, in order to avoid expensive failure in service. Hot corrosion studies were conducted on both coated and uncoated specimen in air and salt (Na_2SO_4 -60% V_2O_5) at 900°C under cyclic conditions for 50 cycles. An each cycle of one hour heating at 900°C followed by 20 minutes of cooling in air. Yttria-Stabilised Zirconia (YSZ) coatings were deposited on T-92 boiler steel weldments. In this paper present a comparison on the experimental performance of YSZ coating has been made to understand their hot corrosion behavior. This YSZ coatings increase the resistance to corrosion substantially which can be attributed to formation of zirconium oxides (ZrO_2) and yttrium oxide (Y_2O_3). This coating was more significant in salt environment and there is an additional phase of ZrS. Thermo-gravimetric technique was used to establish oxidation kinetics and X-Ray Diffraction (XRD) and scanning electron microscopy/Energy Dispersive Spectrometry (SEM/EDS) techniques were used to characterize the oxide scales.

Keywords: hot corrosion, yttria-stabilised zirconia, thermal barrier coating.

1. INTRODUCTION

Hot corrosion can be regarded as an accelerated oxidation attack of metals exposed to the flow of

application TBC is also useful in aerospace, aircraft and boiler applications.

The different functions of the coating, such as

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Micro-ECM Drilling of Copper Alloy and Taguchi Optimization

Authors: Venkatajalapathy Subburam, Sengottuvelu Ramesh

Online since: June 2015

Chapter 11: Advances in Drilling Process

Abstract: The objective of the study is to conduct experiments to investigate the performance of Electrochemical Micromachining (EMM) process to drill micro-holes on Copper alloy and analyze the parameters to optimize by Taguchi method. An EMM setup developed in-house is used to conduct the experiments. Copper alloy as workpiece, Stainless Steel needle of sharp conical edge as tool and Sodium Nitrate as electrolyte are used. A Pulse generator is used to supply pulsed current. The input parameters analyzed for optimization are Voltage, Pulse on-time and Electrolyte Concentration. The Material Removal Rate (MRR) and Overcut are taken as output parameters to study the process performance. The experiment was designed according to L9 Orthogonal Array (OA) of Taguchi design. The observations have shown that the MRR increases and the accuracy decreases when the level





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Experimental Study on Energy Recovery from Condenser Unit of Small Capacity Domestic Refrigerator

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Abstract: This paper presents an investigation on heat recovery from the condenser of the Vapour Compression Refrigeration (VCR) system through hot oven and heater which is placed between the compressor and condenser components. The presence of oven makes it possible to recover the superheat of the discharge vapour and utilize it for increasing the temperature of the space inside the hot oven and increase the temperature of the water in the heater chamber. Temperature of the juice in the juice cooler chamber is also

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Mechanical Performance of Coir and Glass Fibre Reinforced Hybrid composite materials for Automotive Brake Pad

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**Experimental Study on Energy Recovery from Condenser
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Mechanical Performance of Coir and Glass Fibre Reinforced Hybrid composite materials for Automotive Brake Pad

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Comparative Study of Neutral and Acidified Electrolytes for Micro-ECM Process Parameters

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Micro-drilling of Metal-Ceramic Composite through Electrochemical Micromachining

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Mechanical Performance of Coir and Glass Fibre Reinforced Hybrid composite materials for Automotive Brake Pad

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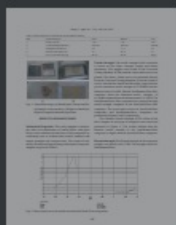
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Experimental Investigation on the Mechanical Properties of Jute/Sisal/Glass and Jute/Banana/Glass Hybrid Composite Materials

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Abstract: This present work investigates the hybridization of glass fibers with natural fibers for the applications of structural, aerospace and automobile industry. Composites made of natural fibers are of low cost, light weight and user friendly but lower in strength when compared to synthetic fibers. Hence, the natural fiber and synthetic fiber composition need to be optimized for utilization as High Strength (HS) hybrid composite materials for many applications. In this research work two hybrid composites have been developed using Glass, Jute, Sisal and Banana fibers in the form of laminates, namely Jute-Sisal- Glass (JSG) and Jute- Banana-Glass (JBG) combinations. The fabricated test samples have been subjected to tensile, flexural and impact tests to evaluate their mechanical properties. The microstructures of the tested specimens have been performed through Scanning Electron Microscope (SEM) for fracture mode analysis. The comparison of the results shows that the high strength hybrid composite made of Jute-Banana-Glass (JBG) provides better mechanical properties and it could be used for a wide range of applications.

Key words: Glass fibers • Hybrid composites • JSG • JBG • Mechanical Properties • Scanning Electron Microscopy



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Experimental Study on Energy Recovery from Condenser Unit of Small Capacity Domestic Refrigerator

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Abstract: This paper presents an investigation on heat recovery from the condenser of the Vapour Compression Refrigeration (VCR) system through hot oven and heater which is placed between the compressor and condenser components. The presence of oven makes it possible to recover the superheat of the discharge vapour and utilize it for increasing the temperature of the space inside the hot oven and increase the temperature of the water in the heater chamber. Temperature of the juice in the juice cooler chamber is also reduced by pumping the juice in a separate heat exchanger tube attached with the evaporator tube and the cooled juice is stored in the juice cooler chamber. The effectiveness of the cooler with varying working time has been studied. The effect of operating temperature in the oven and heater for varying operating time of a refrigeration system have all been studied and feasible heat recovery have been ascertained. The parametric result obtained for varying working hours have also been presented.

Key words: Waste heat recovery • Vapour compression refrigeration system • Hot oven • Water heater
• Juice Cooler

INTRODUCTION

By experimenting with waste heat recovery system in refrigeration unit, Karthik et al. have found that in general

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Comparative Study of Neutral and Acidified Electrolytes for Micro-ECM Process Parameters

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Abstract -- Unconventional machining techniques are preferred by industries in the micro-manufacturing domain. Electrochemical Micromachining (Micro-ECM), a non-conventional method finds wide application in many industries for generating micro-features to make use of its inherent advantages. But controlling the process is a difficult task as it is a complex one with a variety of variable inputs influencing the performance. The influence of electrolyte on the performance of electrochemical micromachining process is a major factor as its characteristics like concentration, flow dynamics, temperature, throwing power and sludge formation have great influence on the process. The objective of this paper is to conduct experiments to investigate and compare the influence of neutral and acidified electrolytes on Material Removal Rate and shape accuracy. Micro-holes were generated on Stainless Steel-304 work-plate using stainless steel tool electrode. Influence of neutral salt electrolyte (NaNO_3) and acidified electrolyte ($\text{NaNO}_3 + \text{HCl}$) on process parameters like applied voltage, current, pulse ON/OFF time and electrolyte concentration are studied and compared by carrying out experiments. It is observed that acidified

Wansheng Zhao et al [4] have designed a setup along with high frequency pulse power supply system to conduct electrochemical machining experiments at micro to meso-scale. It was reported that with low machining voltage, high frequency, short pulse current, low electrolyte passivity concentration and reducing inter-electrode gap up to $10\mu\text{m}$, better shape accuracy and material removal rate can be achieved.

Bao Huaqian et al [5] have developed a technique called electrochemical micromachining in pure water (PW-ECM), an environment friendly micromachining for use in aerospace industry. The drawbacks in this process like short circuit and sparks were overcome by devising a combined machining process of PW-ECM assisted by ultrasonic vibration (PW-ECM/USV). Square cavities, holes and English alphabets were generated on stainless steel plate using this process.

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Micro-drilling of Metal-Ceramic Composite through Electrochemical Micromachining

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Abstract—Non-traditional machining techniques that employ other than mechanical forces are widely in use in the micro-manufacturing domain to machine materials that are difficult to machine in the conventional processes. Electrochemical micromachining (EMM) is a leading unconventional technique based on the principle of electrolysis. EMM process is being researched continuously for its capability to machine a variety of conducting materials such as metals, alloys and composites. The present work involves experimental investigation of EMM process to generate micro-holes on a metal-ceramic composite specimen containing Aluminum and Titanium Carbide. A desktop EMM setup along with a pulse generator was used to conduct experiments. The influence of input parameters like machining voltage, current, pulse on-time, electrolyte concentration and frequency on Material Removal Rate (MRR) and Overcut were analysed to study the process performance. The experimental results show that presence of ceramic particles in the specimen produces poor shape accuracy.

Keywords—EMM; NaN_3 ; AlTiC composite; Material Removal

optimization of machining voltage, duty cycle and electrolyte concentration obtained from the experiments were used to attempt three dimensional micromachining. [3].

Kozak et al. investigated the detail transfer in this process from the cathodic tool electrode onto the anode work surface and studied the electrochemical copying of micro features. Application of ultra-short pulse current and ultra-small electrode gap were recommended for improving the capability of micro-ECM processes [4]. Liu Yong et al. successfully developed an EMM system, conducted experiments to find the predominant process parameters which then were applied to machine a complex microstructure [5]. Electrolytes are chosen to suit the dissolution of work material and different types of electrolytes have been tried to investigate their influence on the process. Acidified electrolytes have also been used to investigate their influence on the performance of the EMM process [6]. The absence of thermal stresses and mechanical stresses in the EMM process was successfully utilized to fabricate micro structures on NiTi Shape Memory Alloy by Joseph et al.[7]. Ramarao et al. investigated the dissolution





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Static Analysis of Leaf Spring with Heterogeneous Concept

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Abstract— Suspension system is a major unit in automotive design, especially leaf spring design. It absorbs payload and road loads to give comfort to vehicle. Loads travel through each leaf and produce contact stress with each contact members, this effectively reduces the life time of the spring system. Spring steels are majorly preferred as leaf spring material, but in practical nature vehicle carries loads that are much higher than

surface, the wheel moves up, this leads to deflecting the spring. This changes the length between the spring eyes. The leaf spring should absorb the vertical vibrations and impacts due to road irregularities by means of vibrations in the spring deflection so that the potential energy is stored in spring as strain energy and then released slowly. So, the

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Micro-drilling of Metal-Ceramic Composite through Electrochemical Micromachining

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Abstract—Non-traditional machining techniques that employ other than mechanical forces are widely in use in the micro-manufacturing domain to machine materials that are difficult to machine in the conventional processes. Electrochemical micromachining (EMM) is a leading unconventional technique based on the principle of electrolysis. EMM process is being researched continuously for its capability to machine a variety of conducting materials such as metals, alloys and composites. The present work involves experimental investigation of EMM process to generate micro-holes on a metal-ceramic composite specimen containing Aluminum and Titanium Carbide. A desktop EMM setup along with a pulse generator was used to conduct experiments. The influence of input parameters like machining voltage, current, pulse on-time, electrolyte concentration and frequency on Material Removal Rate (MRR) and Overcut were analysed to study the process performance. The experimental results show that presence of ceramic particles in the specimen produces poor shape accuracy.

Keywords—EMM; NaNO_3 ; Al-TiC composite; Material Removal Rate; Overcut

optimization of machining voltage, duty cycle and electrolyte concentration obtained from the experiments were used to attempt three dimensional micromachining. [3].

Kozak et al. investigated the detail transfer in this process from the cathodic tool electrode onto the anode work surface and studied the electrochemical copying of micro features. Application of ultra-short pulse current and ultra-small electrode gap were recommended for improving the capability of micro-ECM processes [4]. Liu Yong et al. successfully developed an EMM system, conducted experiments to find the predominant process parameters which then were applied to machine a complex microstructure [5]. Electrolytes are chosen to suit the dissolution of work material and different types of electrolytes have been tried to investigate their influence on the process. Acidified electrolytes have also been used to investigate their influence on the performance of the EMM process [6]. The absence of thermal stresses and mechanical stresses in the EMM process was successfully utilized to fabricate micro structures on NiTi Shape Memory Alloy by Joseph et al.[7]. Ramarao et al. investigated the dissolution rate of Al-B₄C composite in EMM machining by studying the effect of process variables [8]. The application of composite





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Static Analysis of Leaf Spring with Heterogeneous Concept

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Abstract— Suspension system is a major unit in automotive design, especially leaf spring design. It absorbs payload and road loads to give comfort to vehicle. Loads travel through each leaf and produce contact stress with each contact members, this effectively reduces the life time of the spring system. Spring steels are majorly preferred as leaf spring material, but in practical nature vehicle carries loads that are much higher than

surface, the wheel moves up, this leads to deflecting the spring. This changes the length between the spring eyes. The leaf spring should absorb the vertical vibrations and impacts due to road irregularities by means of vibrations in the spring deflection so that the potential energy is stored in spring as strain energy and then released slowly. So, the

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An Experimental Investigation on Abrasive Wear Behaviour of Different Ceramics Coating on AISI 1040 Steel by Plasma Process

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²Department of Mechanical Engineering,
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³Prudential Sugar Corporation Ltd., Chittoor Andhra Pradesh, India

Abstract: This study analyzes by the plasma technique, the microstructure and abrasive wear performance of AISI 1040 steel surface coated with 85% Al₂O₃, 15% TiO₂, 55% TiO₂, 45% Cr₂O₃, 40% Cr₂O₃, 60% TiO₂ and 99% Cr₂O₃ ceramic materials. To the present finish, the surface of AISI 1040 steel was covered with the ceramic materials of 85% Al₂O₃, 15%TiO₂,55% TiO₂, 45% Cr₂O₃, 40%Cr₂O₃,60%TiO₂ and 99% Cr₂O₃, using the plasma technique. Following the coating method, the abrasive wear behaviour of every sample was tested by the pin-on-disc technique. ZrO₂ grating paper was utilized as abrasive. The best wear behaviour was obtained with the ceramic coating containing 85% Al₂O₃ that was trailed by 60% TiO₂, 55% TiO₂ and 45% Cr₂O₃ respectively. All time low wear resistance was ascertained in 99% Cr₂O₃ ceramic coating. Wear resistance of the samples enhanced with increasing micro hardness value. Micro cracking is that the main wear mechanism within the samples with high micro hardness values, whereas micro scratching-type wear method was detected within the samples with low hardness values.

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Overview on Mobile Application Learning Management System

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Abstract: Cross Platform Mobile Application Development is the development of mobile based applications so that the development of these types of applications can be made platform-independent. A review has been made in this field while considering Integrated Development Environment is being proposed which will help a software developer to code an application in a single code base and deploy that single sphere of life. Whether it is entertainment or education, we can see a very intense use of mobiles and we can consider them as a new personal computer. It doesn't mean that desktop computers are now useless, but the mobile devices market is growing fast. They are cheap, convenient because of their portability, and due to geo location often more

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R.Jayavadeivel¹, B.Prabhushankar², S.Rajesh³

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Associate Professor, Department of IT, Paavai Engineering College, Namakkal, Tamilnadu, India

Assistant Professor, Department of CSE, Paavai Engineering College, Namakkal, Tamilnadu, India

ABSTRACT: Image quality assessment plays an important role in the performance of biometric system involving iris and face images. Data quality assessment is a key issue in order to broaden the applicability of iris and face biometrics to unconstrained imaging conditions. In this paper, we have proposed the quality factors of individual iris images by

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R.Jayavadevel¹, Dr.J.Sundararajan², G.Arulselvam³
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Principal, Paavai College of Technology, Pachal, Namakkal, Tamilnadu, India.²
B.Tech, Department of IT, Paavai Engineering College, Pachal, Namakkal, Tamilnadu, India.³

ABSTRACT: Today Multimedia and its applications play a major role of importance in Internet, at the same time it also have an equivalent drawback parameters in accessing and using them. In this paper, the common problem in Multimedia application has been discussed by providing a common solution for that. This paper is investigating a new concept called "a Circular buffer with circular linked list concept with dynamic allocation method was proposed in

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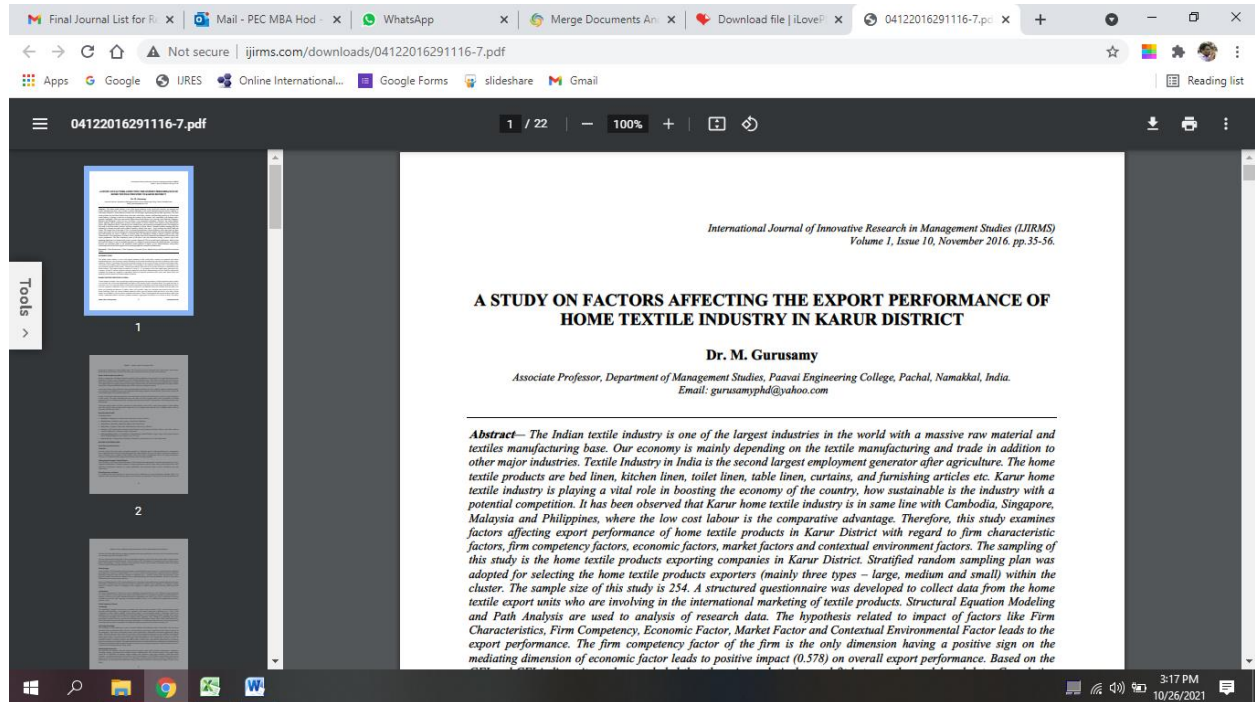
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Delay Tolerant Spatial Distribution of Content Replication in Wireless Networks for Efficient Video Streaming

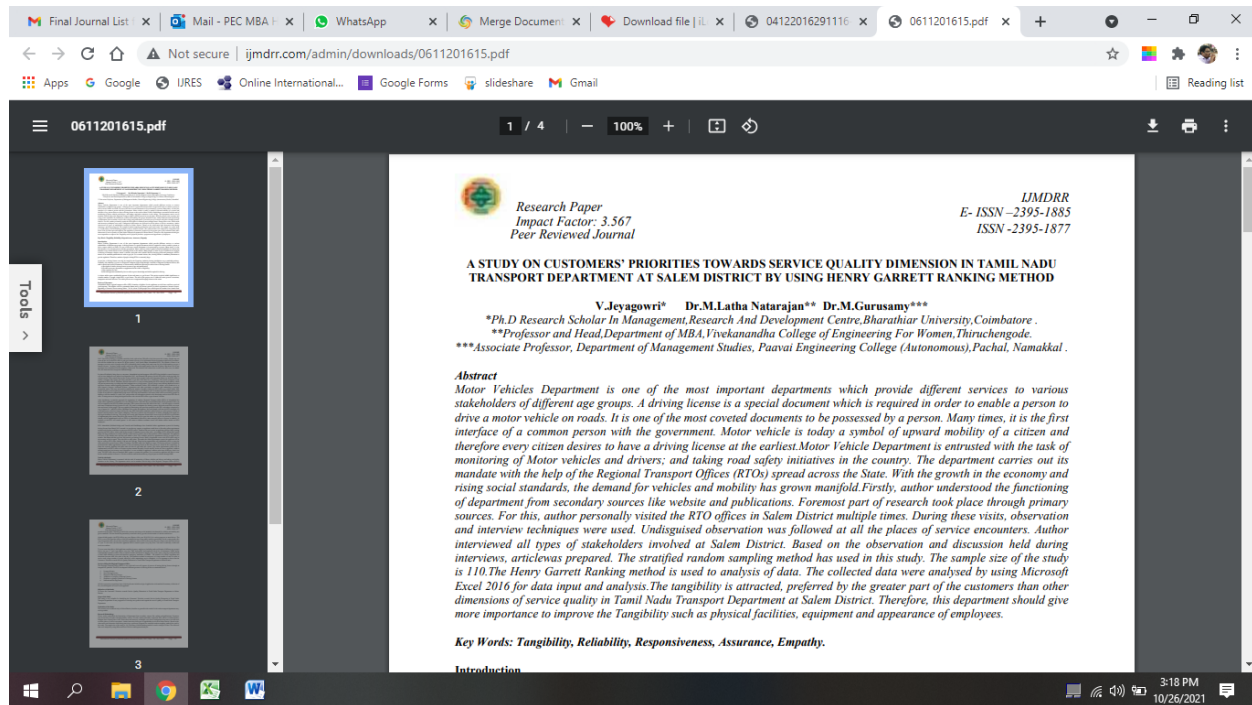
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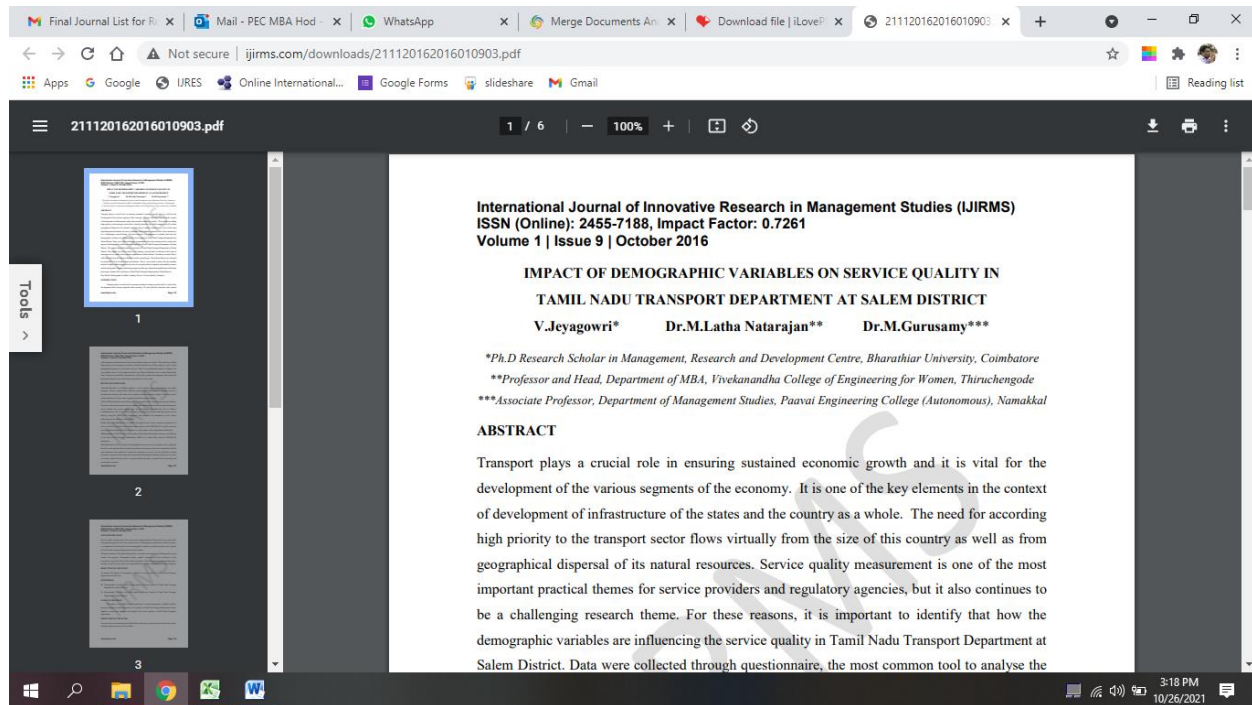
Abstract: The growth of information technology has introduced various functionalities and services to support video streaming like video streaming and live streaming. There are many approaches that have been discussed to support content delivery in wireless networks, but suffers with the problem of latency and quality of streaming which takes more time and the frequency of retransmission is high. To solve these problems, we propose a delay tolerant approach with spatial distribution of video contents to support efficient video streaming. The proposed method maintains numbers of replicas of video content in different locations of wireless networks. The method selects the location of the video content or the node which has the requested data according to the delay present in the network and the user location. Also the number of replicas maintained is performed according to the spatial request factor which represents the number of request being received from different user from a specific spatial region and the delay present in the network towards a video content. The proposed method reduces the overall latency present in the network and increases the efficiency of content delivery which supports multimedia data transfer. Also the proposed method reduces the overall time complexity and reduces the overhead introduced by data transfer.



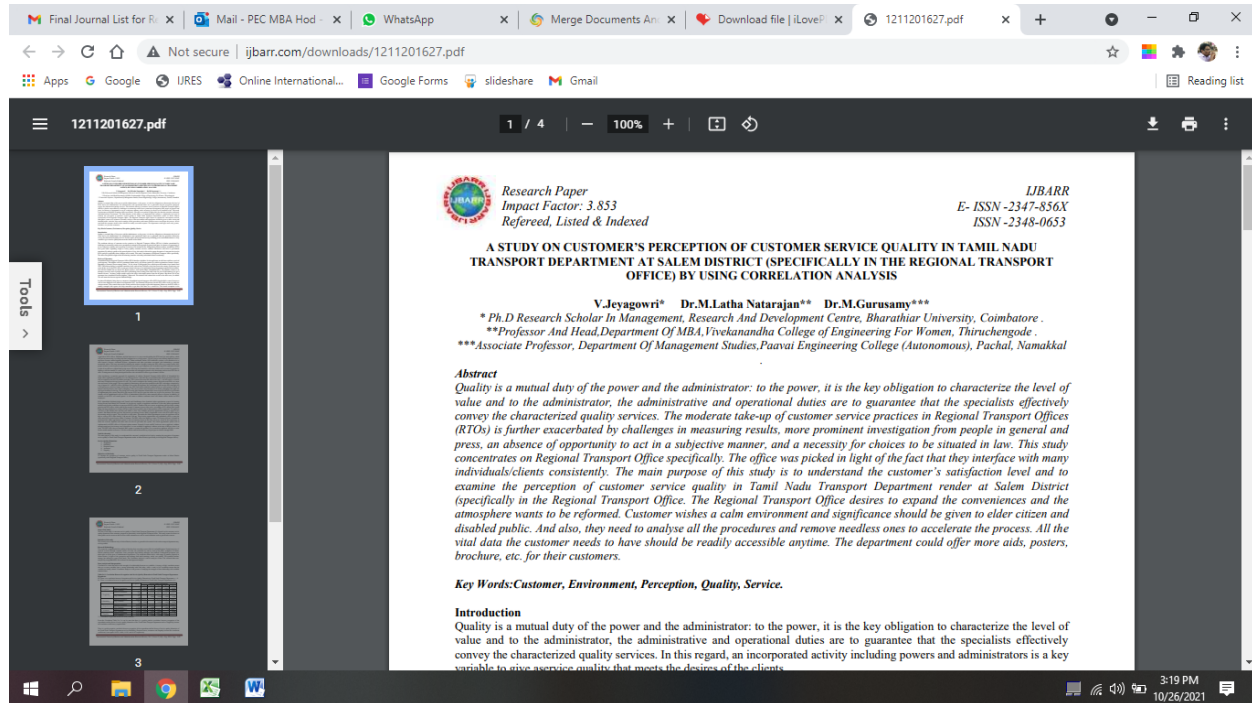
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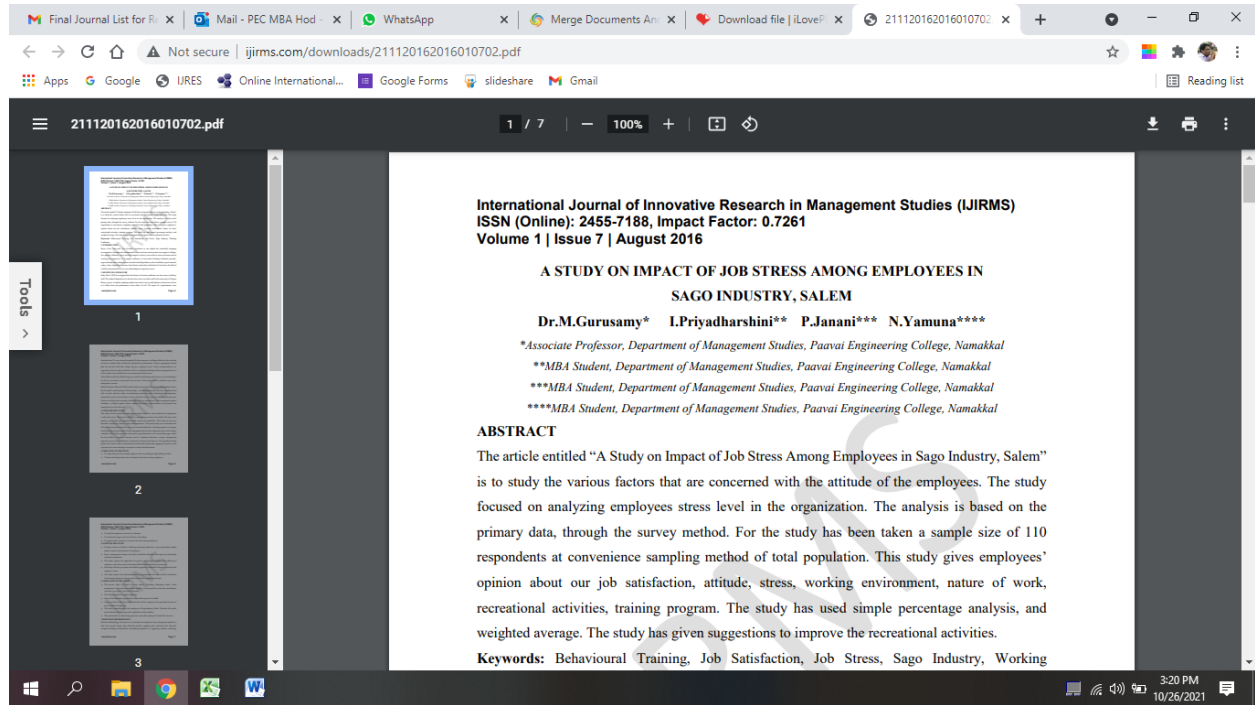
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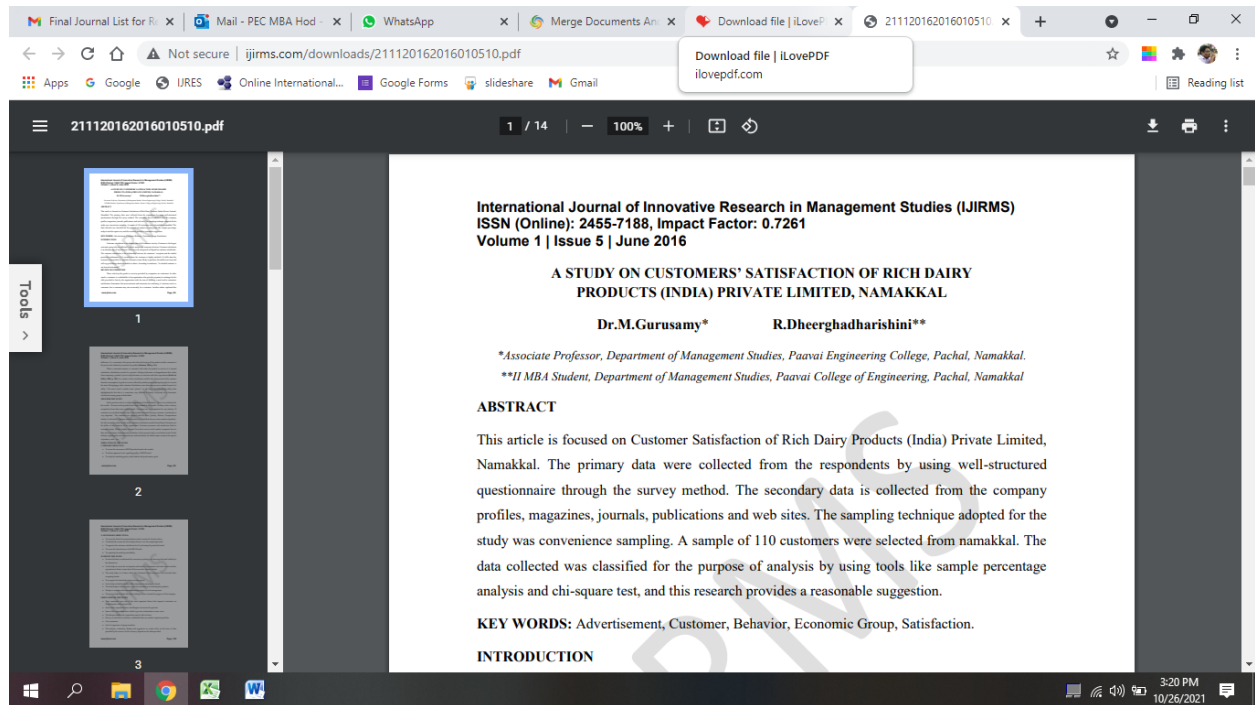
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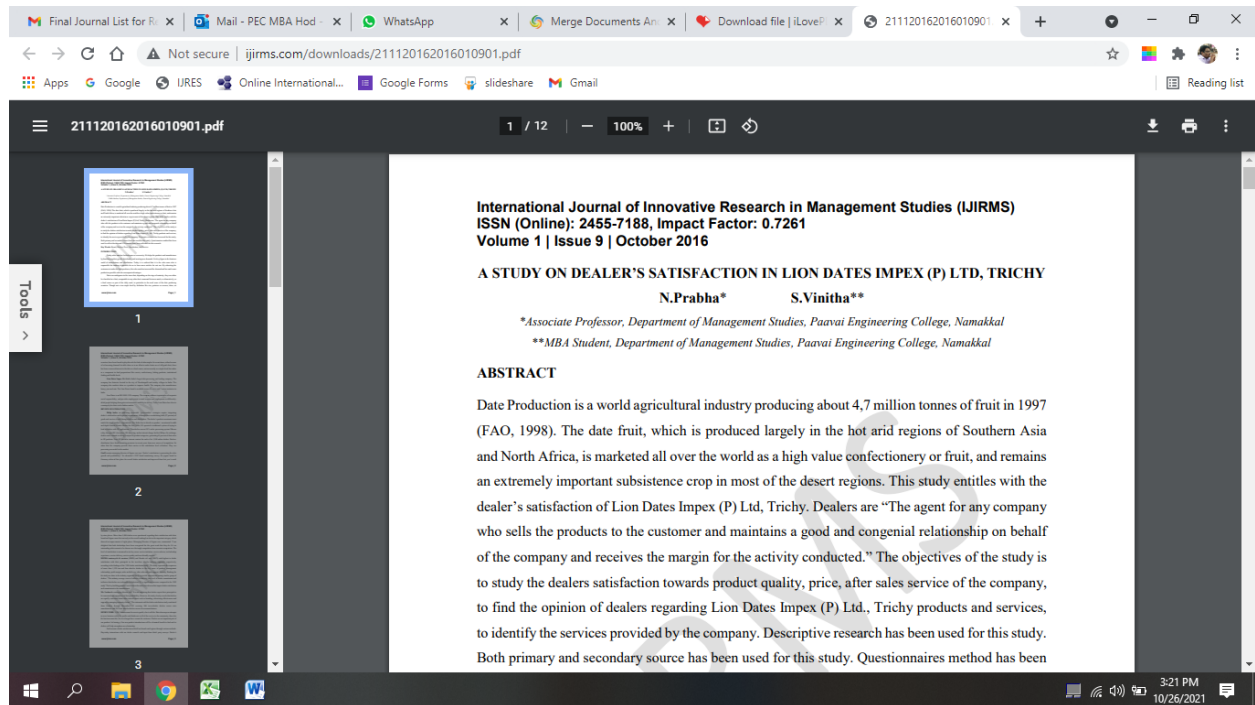
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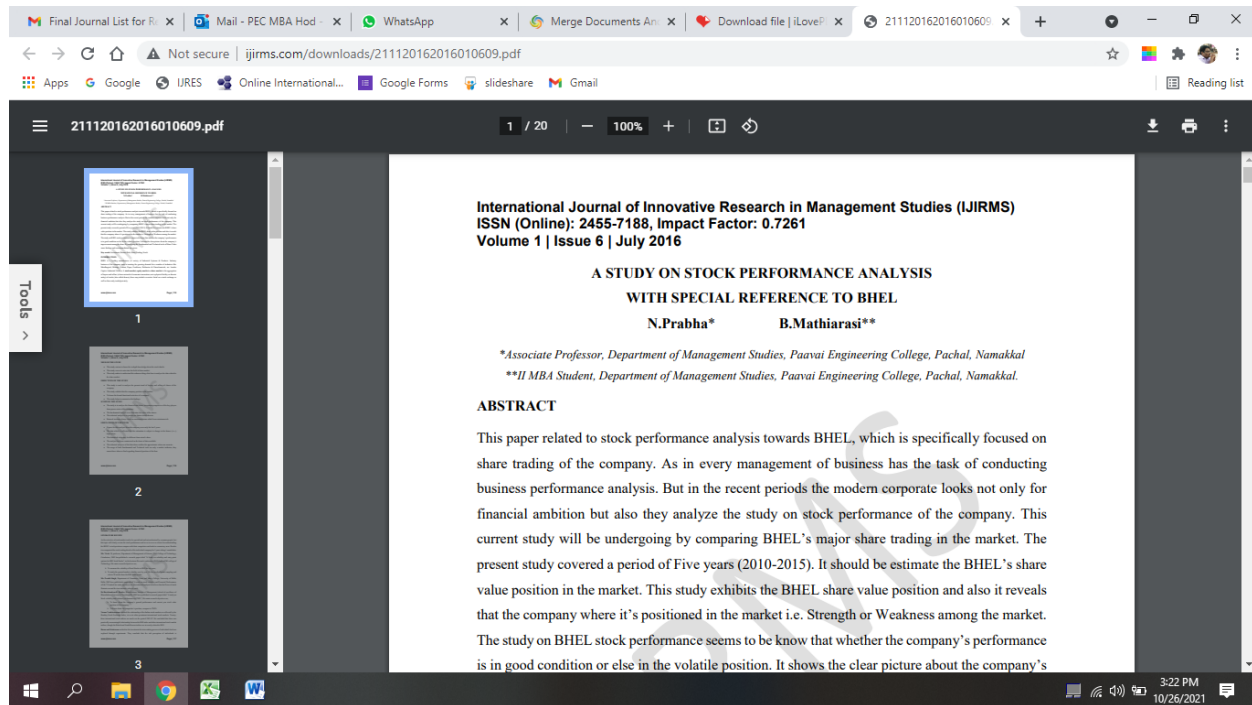
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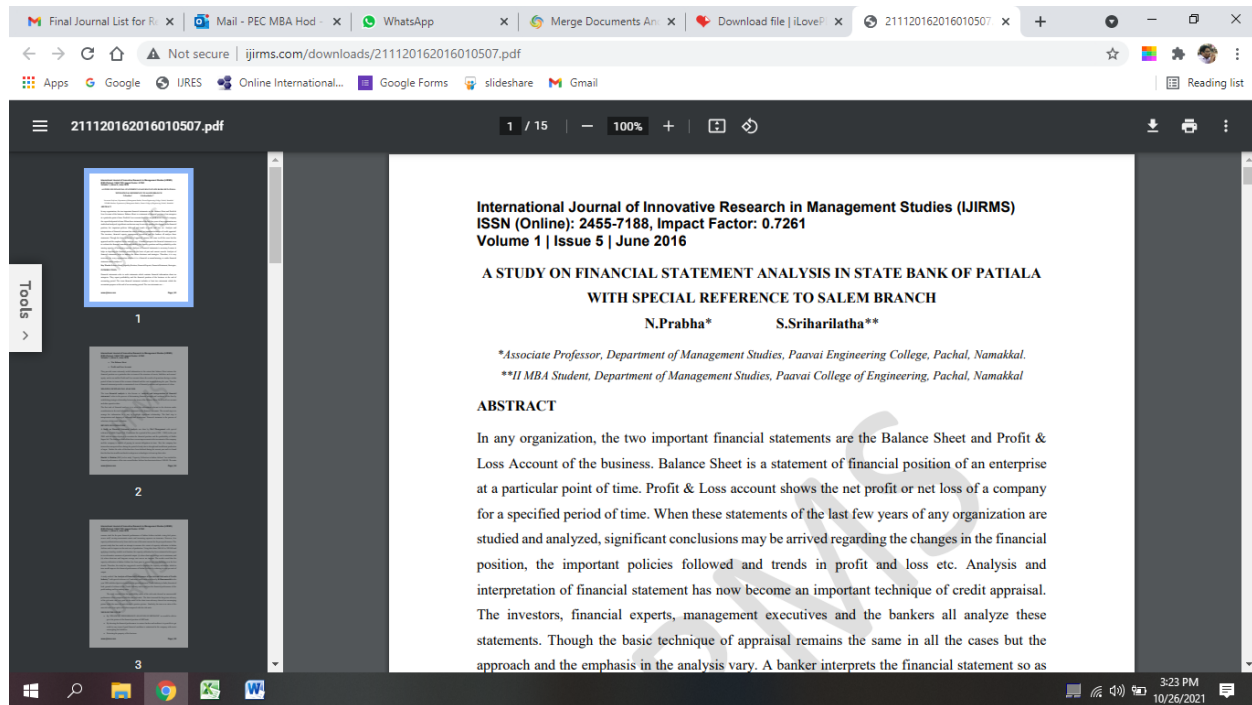
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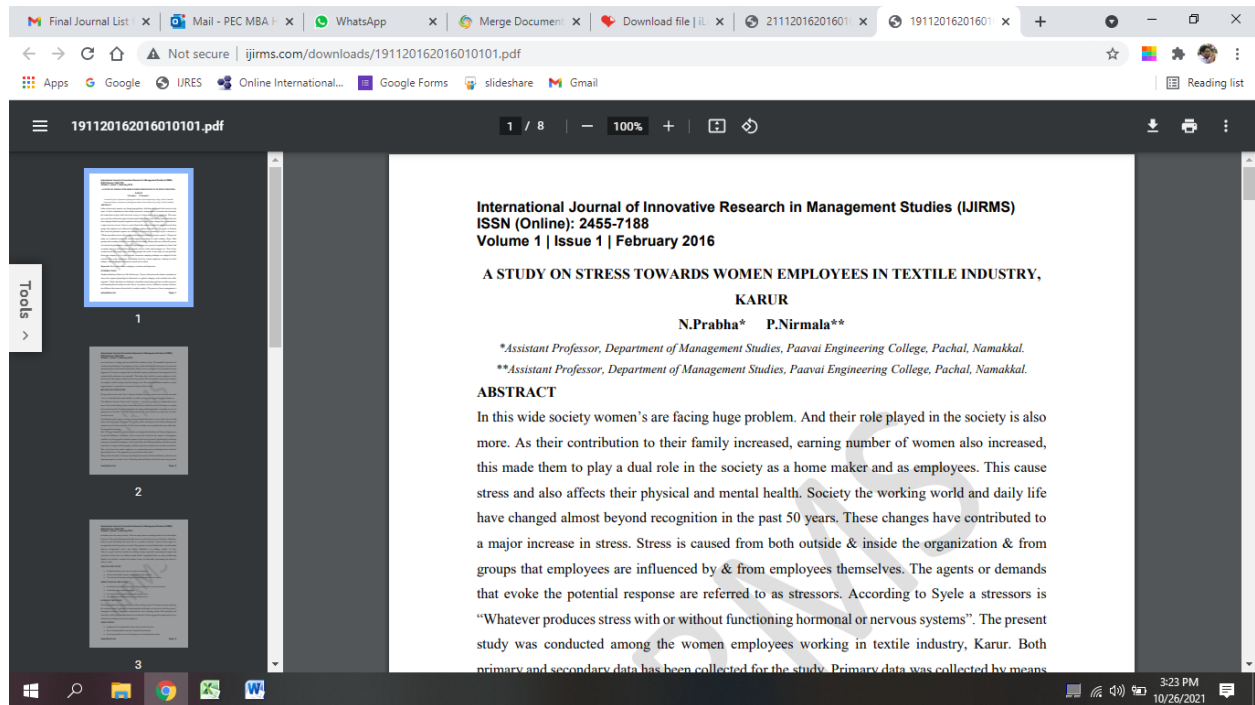
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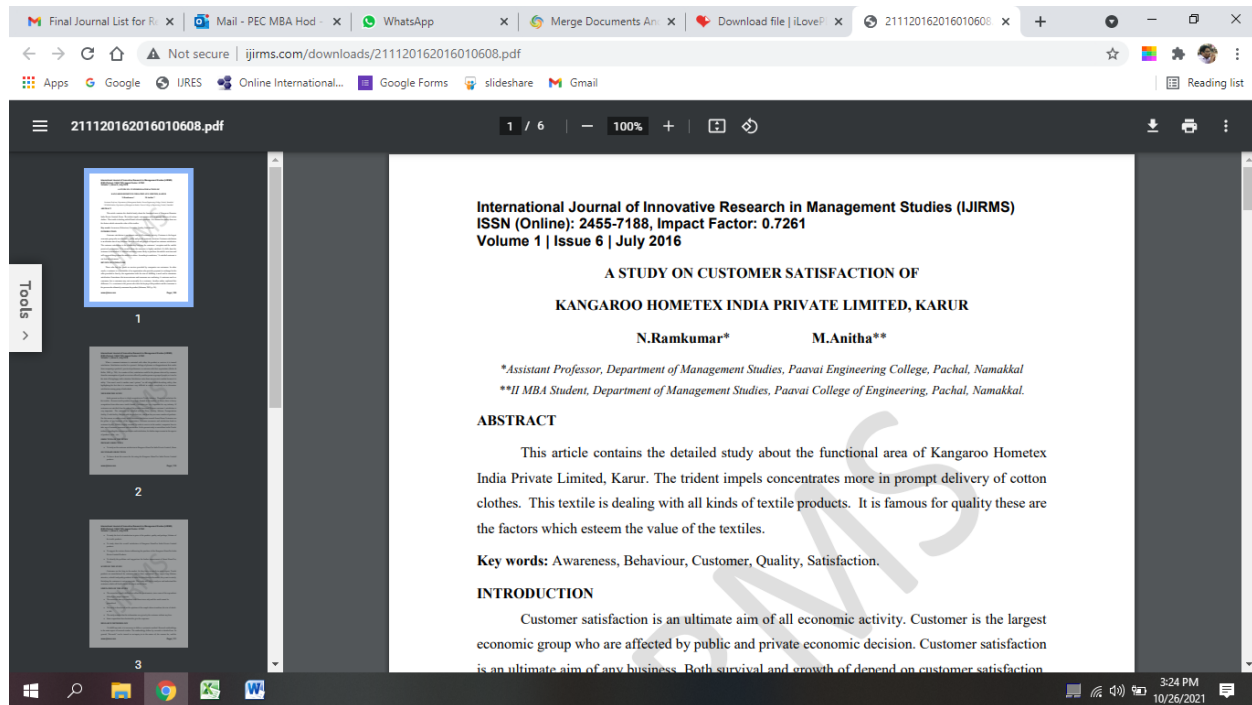
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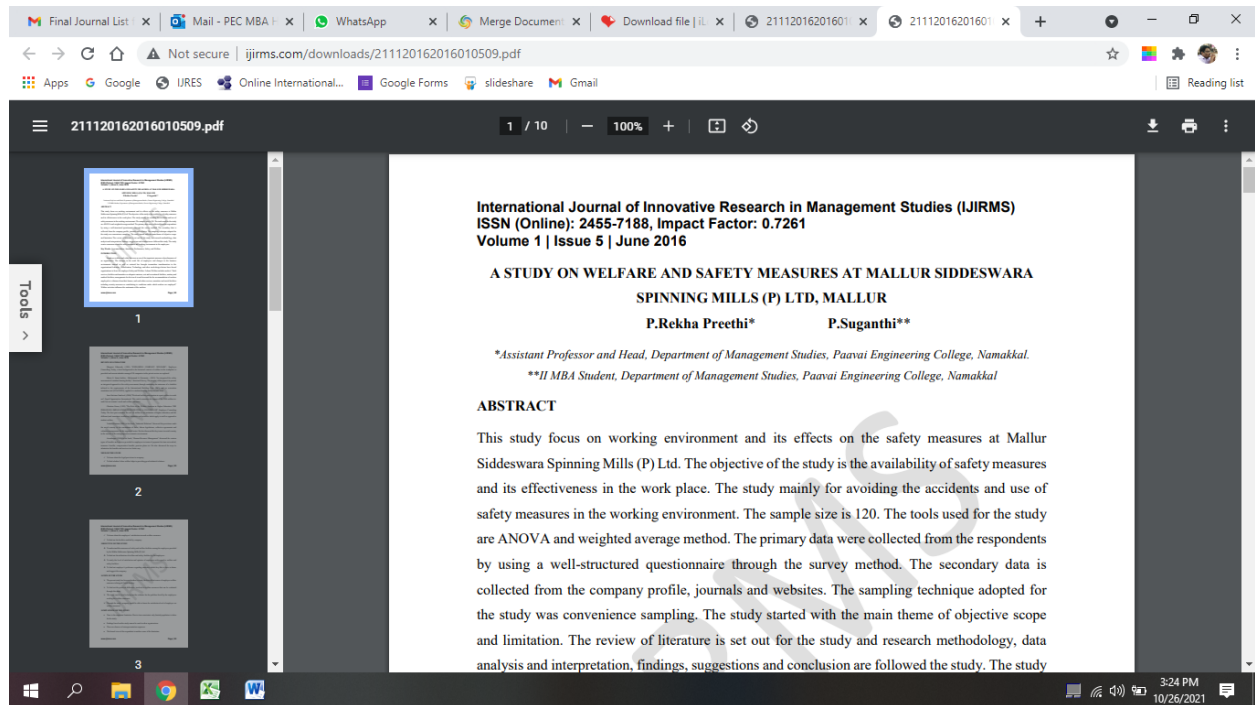
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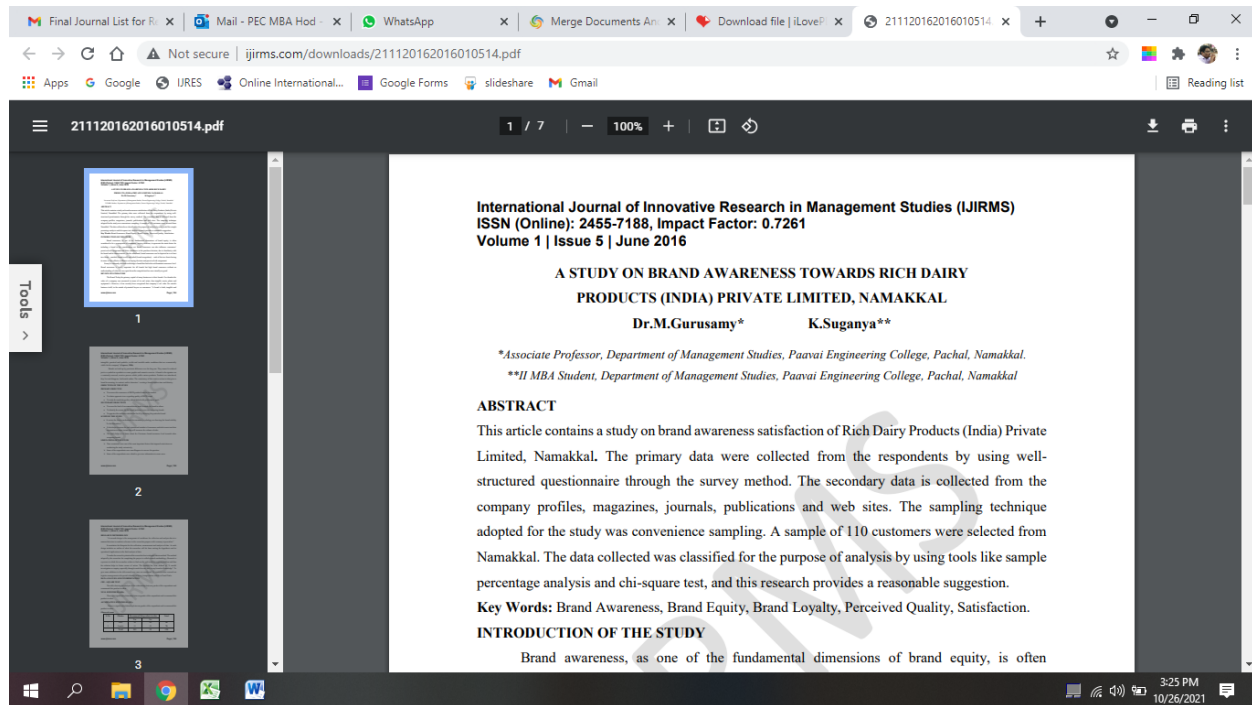
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Effect of Mg doping on structural, optical and photocatalytic activity of SnO₂ nanostructure thin films

S. Vadivel · G. Rajarajan

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Abstract In the present work, magnesium (Mg) doped SnO₂ nanocrystalline thin films were synthesized by simple chemical bath deposition technique. The as-deposited films were annealed at 600 °C for 5 h in ambient atmosphere in order to improve crystallinity and structural perfection. The influence of Mg doping on structural, optical, and mor-

1 Introduction

Transparent conducting oxides (TCOs) are a unique type of materials that combine electrical conductivity and optical transparency, simultaneously, with a wide range of applications e.g. displays, low emissive (low-e) windows, thin



Influence of Cu doping on structural, optical and photocatalytic activity of SnO₂ nanostructure thin films

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Abstract This paper describes the pure and copper doped SnO₂ nanocrystalline thin films with large specific surface areas fabricated on a desired substrate using a simple chemical bath deposition technique. The as-deposited films were annealed at 500 °C for 2 h in ambient atmosphere in order to improve the crystallinity and structural perfection. The influence of Cu doping on structural, optical, and surface topography of the film films was studied by X-ray diffraction (XRD), Raman spectra, UV-Vis spectra, photoluminescence, and atomic force micrograph images. The XRD measurements showed that films had a tetragonal rutile type structure with P42/mnm symmetry and the results were good in agreement with the standard JCPDS data (card no. 41-1445). The surface roughness and porosity has been found to decrease with the increase of the dopant concentration as investigated by atomic force microscopy. The characteristic Raman peaks observed at 325, 466, 672 and 745 cm⁻¹ were respectively revealed infrared active (E_g), Raman active (E_g), (A_{1g}) and (B_{2g}) vibration modes of pure tetragonal rutile SnO₂ structure. The optical band gap energy of pure SnO₂ has been found to be in the range of 3.68 eV and it is shifted to 3.32 eV for 10 wt% Cu doping. The photocatalytic activities of the films were evaluated by the degradation of methylene blue rhodamine B in an aqueous solution under ultraviolet light irradiation. The photocatalytic activity and reusability of Cu (10 wt%)

doped SnO₂ film was much higher than that of the pure SnO₂.

1 Introduction

Textiles industry wastewater is heavily charged with unconsumed dyes, surfactants and sometimes traces of metals. These effluents cause a lot of damage to the environment. In most countries researchers are looking for appropriate treatments in order to remove pollutants, impurities and to obtain the decolorization of dye house effluents [1]. Metal oxide semiconductors with small and medium band gaps show lower light-harvesting ability in visible light [2]. Therefore, coupling of semiconductors with different band gaps is a good approach to prepare photo catalysts with high activity and good stability. Among the large number of metal oxides (TiO₂, ZnO, WO₃ and In₂O₃), tin oxide (SnO₂) has become a promising material due to its unique properties such as high electrical conductivity, high optical transparency in the visible part of the electromagnetic spectrum. This metal oxide has wide range of applications in low emission glass, electrodes, organic light emitting diodes optoelectronic devices, lithium batteries, gas sensors, heat reflectors and polymer based electronics [3]. Moreover, SnO₂ exhibits good activity and stability under irradiation. However, the pure SnO₂ shows much lower photo catalytic activity even under UV irradiation due to its large band gap (3.6 eV) [4]. To improve its photo catalytic activity, it is necessary to couple SnO₂ with another semiconductor with lower band gap. The CuO is a p-type semiconductor with a small band gap (1.7–1.2 eV). If the SnO₂ is coupled with the CuO, the n-SnO₂/p-CuO heterojunctions can be formed in. The photo generated electrons from SnO₂ can easily migrate to CuO. This favors the separation of photo generated

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Effect of W doping on structural, optical and photocatalytic activity of SnO₂ nanostructure thin films

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Abstract Thin films of undoped and tungsten (W) doped SnO₂ have been synthesized on a glass (ITO) substrate using a simple chemical bath deposition technique. The as-deposited films were annealed at 500 °C for 5 h in ambient atmosphere in order to improve the structural perfections and crystallinity. X-ray diffraction studies showed that the W-SnO₂ films were polycrystalline in nature with tetragonal rutile type structure of SnO₂ phase. The surface roughness and porosity have been found to decrease from 47 to 39 nm with the increase of dopant concentration as investigated by atomic force microscopy. The optical absorption edge was found to be 3.46 eV, while the higher concentration of W doped films shifted towards lower energy (red shift) in the range of 3.35 eV. The effect of W on impurity, defect states and oxygen vacancy of the SnO₂ film was analyzed by photoluminescence spectra. The photocatalytic activities of the films were evaluated by the degradation of methylene blue (MB) rhodamine B (RHB) in an aqueous solution under visible light irradiation. The photocatalytic activity and reusability of W (10 wt%) doped SnO₂ film were much higher than that of the pure SnO₂. The improvement mechanism of RHB by W-SnO₂ catalyst was also discussed.

1 Introduction

In recent years, transparent conducting oxide (TCO) films like, SnO₂, ZnO, TiO₂ and WO₃ have reached a vital place in a variety of optoelectronic devices such as solar cell, gas sensor, flat panel displays, and varistors [1]. Hence, there has been a growing attention in the applications of TCO films in solar cell device. Among these, SnO₂ serves as an important material due to its excellent chemical stability, optical and electrical properties. SnO₂ is an important n-type semiconductor with a wide band gap ($E_g = 3.6$ eV, at 27 °C) and it is well known for various potential applications such as excellent gas sensors, electrode materials in Li/SnO₂ batteries, catalysts [2] and so on. In addition to this, they exhibit low electrical resistivity and high electrical transmittance in the visible light and near IR region. Many methods have been adopted to synthesize of SnO₂ thin films such as, sol-gel [3], pulsed plasma deposition [4], pulsed laser deposition [5], reactive evaporation [6] and chemical bath deposition [7] methods. Among these techniques, chemical bath deposition method is an attractive method to get intended thin films. Moreover chemical bath deposition yields stable, adherent, uniform and hard films with good reproducibility by a relatively simple process [7]. So in the present work, we adopted chemical bath deposition method to synthesize of pure and W doped SnO₂ thin films.

Generally, SnO₂ suffers from low photocatalytic efficiency because of its wide-band gap (energy of the band gap is about 3.6 eV) and high recombination rates of photo generated electron-hole pairs. This deficiency hinders SnO₂ photocatalyst using widely and practically in the environmental application [8]. To overcome this problem doped with suitable metal ions can increase the photocatalytic activity. Many researchers have paid much attention

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Comparative investigation of CuFe_2O_4 nano and microstructures for structural, morphological, optical and magnetic properties

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4. Conclusions

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Effect of glycine and L-arginine as processing fuels in the synthesis of ZnFe_2O_4 nanostructures prepared via a facile microwave combustion method

G. Raja^a, S. Gopinath^{b, c}, K. Sivakumar^d

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