



Shram Sadhana Bombay Trust's
COLLEGE OF ENGINEERING & TECHNOLOGY
BAMBHORI, POST BOX NO. 94, JALGAON- 425001. (M.S.)
Included Under Section 2(f) & 12(B) of the UGC Act, 1956
ISO 9001:2015 Certified



November 2021

RESEARCH PAPERS PER TEACHER IN UGC CARE JOURNALS

Phone: (0257) 2258393, 94, 95 Fax: (0257) 2258392
Website- www.sscoetjalgaon.ac.in Email: sscoetjal@gmail.com

3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the last five years

3.3.2.1. Number of research papers in the Journals notified on UGC website during the last five years

Findings of DVV:

- 1) Provide the link landing to the paper/article.
- 2) Provide the link to the journal website.
- 3) Provide screenshots of research articles clearly showing the title of the article, affiliation, name of the journal, year and authors name.
- 4) The HEI should indicate in the data template against each paper about the presence of the paper in the UGC CARE list/Scopus/Web of Science/other clearly.

Response of HEI:

- 1) The links landing to the paper/article are provided
- 2) The links to the journal website are provided
- 3) Screenshots of research articles clearly showing the title of the article, affiliation, name of the journal, year and authors name are provided
- 4) In the data template against each paper presence in the UGC CARE list/Scopus/Web of Science/other clearly is indicated.

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Website- www.sycetj.algaon.ac.in
 Email: sycetj@gmail.com
 Principal: Dr. G.K. Patil
 M.E.(CSE), Ph.D. (CSE)

Phone No. (0257) 2258393
 Fax No. (0257) 2258392

The table below is indicating the links landing to the papers/articles, the links to the journals and paper presence in the UGC CARE list/ Scopus/ Web of Science.

Title of paper	Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number		
	Link to website of the Journal	Link to article/paper/abstract of the article	Is it listed in UGC Care list/Scopus/Web of Science/other, mention
Year 2020-21			
Effect of pour point depressants and diluents on exergy destruction during pipeline transportation of crude oil	https://iopublishing.org/publications/our-journals/	doi:10.1088/1757-899X/1163/1/012B04	Scopus
Protection of the environment along the NH6	https://portal.issn.org/resource/ISSN/2229-4929	https://portal.issn.org/resource/ISSN/2229-4929	UGC Care Listed
Barriers to TQM Implementation in MSME – Special reference to Jalgaon MIDC	https://publons.com/journal/636062/mukt-shahd-journal/	https://ugccare.unipune.ac.in/Apps/User/WebA/SearchList	UGC Care listed
Domestic Waste Water treatment using Coconut Husk as adsorbent	https://iaa.edu.in/in-international-journal-of-human-rights-a-ugc-care-listed-journal/	https://portal.issn.org/resource/ISSN/2394-0298?language=ar	UGC care listed

UG Programs - Engineering, Chemical, Civil, Computer, Electrical, Electronics & Telecommunication, Mechanical
 PG Programs - Engineering, MCA
 - Management, MBA

Reuse of Lathe Scrap Steel and Waste Fine Scrap Rubber Tyre Concrete	https://niu.edu.in/niu-international-journal-of-human-rights-a-ugc-care-listed-journal/	https://portal.issn.org/resource/ISSN/2394-0298?language=ar	UGC care listed
Permeability of Rubber Concrete: Effect of Aging	https://niu.edu.in/niu-international-journal-of-human-rights-a-ugc-care-listed-journal/	https://portal.issn.org/resource/ISSN/2394-0298?language=ar	UGC Care listed
Design and Implementation of High Voltage Power Supply Using Flyback Converter with EHT for Electrospinning System	https://publons.com/journal/636062/mukt-shabd-journal/	DOI:10.0014.MS.1.2021.V1018.0086781.111275	UGC care listed
Experimental investigation of thermoelectric generator system	https://www.journals.elsevier.com/materials-today-proceedings	https://www.sciencedirect.com/science/article/pii/S2214785321040803	Scopus
An innovative design approach of hot water storage tank for solar water heating system using artificial neural network	https://www.journals.elsevier.com/materials-today-proceedings	https://www.sciencedirect.com/science/article/pii/S221478532036747X	Scopus
Benefits Derived By MSMEs Through Implementation Of TQM-With Special Reference To Khandesh	https://iiiejournal.org/index.php/iiie	https://www.iiiejournal.org/index.php/iiie/article/view/180	UGC care listed
Optimization of diesel engine performance and emission parameters of Karanja biodiesel-ethanol-diesel blends at optimized operating conditions	https://www.journals.elsevier.com/fuel	https://www.sciencedirect.com/science/article/abs/pii/S0016236121003276?via%3Dihub	UGC care listed
Experimental Investigations on Salt Gradient Solar Pond with Additional Non-Convective Zone for Improved Thermal Performance and Stability	https://www.scientific.net/AEE	https://www.scientific.net/AEE/4359	UGC care listed
Year 2019-20			

UG Programs- Engineering: Chemical, Civil, Computer, Electrical, Electronics & Telecommunication, Mechanical
PG Programs - Engineering: MCA
- Management: MBA

Development of mathematical model and its ANN validation of thermoelectric generator system for its performance enhancement	https://publons.com/journal/636062/mukt-shabd-journal/	DOI:09.0014.MS J.2020.V9I5.008 6781.1085.	UGC care listed
Image Encryption Based on Matrix Factorization	https://www.ijeta.org/journals/IJSE	http://www.ijeta.org/journals/ijse/paper/10.18280/ijse.100510	Scopus
SDN SCALABILITY FOR DIFFERENT NETWORK TOPOLOGY AND MULTIPLE RYU CONTROLLERS	http://www.ezcieh-en.com/	http://www.ezciehen.com/gallery/1230.pdf	UGC Care listed
Performance Analysis of dq-PLL Based Controller for Synchronization of Grid Tied Inverter	http://www.journal-eca.com/	http://journal-eca.com/	UGC Care listed
A Single Stage Reconfigurable Power Conversion PV- Battery System	https://www.journalajst.com/	http://ajstfactor.com/passport.php?id=17902	SJIFactor.com
Inverter grid synchronization-A review and Simulation	http://www.ijres.org/	DOI: 109790/9622-1010043136	Copernicus
Review of Nanofiber Production Techniques	https://updatepublishing.com/journal/index.php/ijtrj	https://www.researchjourney.net/special-issues	WorldCat (WorldCat Libraries)
Formulation of Mathematical Model for the Investigation of Frictional Power Loss for Multi cylinder S I Engine using Dimensional Analysis	http://www.scrsc.org/journals/index.php/IJGCN	https://scrsc.org/journals/index.php/IJGCN/article/view/29190	ProQuest DOAJ, ULRICH, J Gate, Science Direct, ESCI
Year Round Thermal Performance of Solar Parabolic Through Collector	https://solidstatetechnology.us/index.php/JSS/aims_and_scope	http://solidstatetechnology.us/index.php/JSS/article/view/6007	Scopus
Barriers to TQM Implementation in MSME - Special Reference To Jalgaon MIDC	https://publons.com/journal/636062/mukt-shabd-journal/	http://shabdbooks.com/gallery/6-may2020.pdf	UGC Care listed

UG Programs- Engineering, Chemical, Civil, Computer, Electrical, Electronics & Telecommunication, Mechanical
PG Programs - Engineering, MCA
Management, MBA

Machining of Aluminium Metal Matrix Composite: A Review	https://www.sciencedirect.com/journal/materials-today-proceedings	https://www.sciencedirect.com/science/article/pii/S221478532030242X	Scopus
Year 2018-19			
New emerging Techniques for Bio Gas Purification Alongwith sewage water treatment using Algae	http://www.ijamtes.org/	UGC APPROVED JOURNAL Serial No. 45550	UGC APPROVED JOURNAL Serial No. 45550
Preparation of Tartaric Acid from Tamarind Leaves	http://www.ijamtes.org/	UGC APPROVED JOURNAL Serial No. 45550	UGC APPROVED JOURNAL Serial No. 45550
Power Quality Problems at Distribution level Under Non-linear Loads	http://www.ijamtes.org/	https://www.ijmr.a.us/ijournal.php	UGC Care listed
ANN based On-Line Monitoring System of Incipient Fault Detection in Power Transformer	http://www.ijamtes.org/	https://www.ijmr.a.us/ijournal.php	UGC Care listed
Comparative Analysis of Multilevel Inverter in Power Application: A Review	http://www.ijamtes.org/	UGC care list serial No. 45550	UGC Care listed
Study of Multilevel Inverters and their Control Strategies: A Review	http://www.ijamtes.org/	Included in UGC care list during 2016-18	UGC Care listed
A Novel Weighted SVM Classifier Based on SCA for Handwritten Marathi Character Recognition	http://research.keralauniversity.ac.in/ijournalDetails.php?include=7118&height=600&width=700px	https://doi.org/10.1080/03772063.2019.1623093	Taylor and Francis
Behaviour of Motorcycle Users towards vehicular air pollution: A study with reference to Jalgaon City	https://journals.indexpopernicus.com/search/details?id=47327	UGC approved Journal no. 63571	UGC Care listed

UG Programs- Engineering: Chemical, Civil, Computer, Electrical, Electronics & Telecommunication, Mechanical
PG Programs - Engineering: MCA
Management: MBA

Micro Perspective of Gold Demand: A Study of Underlying Factors	https://www.researchjourney.net/	UGC approved Journal no. 40705	UGC Care listed
Optimization of Roller Burnishing Process Parameters on Surface Roughness Using Response Surface Methodology	https://www.sciencedirect.com/journal/materials-today-proceedings	https://www.sciencedirect.com/science/article/pii/S2214785319324745	Scopus
"A Comprehensive Review on Privacy Preservation Techniques and Approaches for Data Sanitization".	http://www.ijamtes.org/	DOI.org/10.1016/j.matpr.2019.07.295	UGC Care listed
Year 2017-18			
Fuzzy Logic Controller Based Shunt Connected Three Phase Active Power Filter	http://internationaljournalofresearch.com.in/	https://internationaljournalofresearch.com/	Index Copernicus Database
PI controller base shunt connected three phase active power filter	https://publons.com/journal/385085/international-research-journal-of-engineering-and-/	https://www.irjet.net/	
A Streamlined OCR System for Handwritten Marathi Text Document Classification and Recognition Using SVM-ACS Algorithm	http://oaji.net/journal-detail.html?number=3603	DOI: 10.22266/ijies2018.0630.20	scopus
Modeling, Simulation And Experimental Investigation of Closed Loop MPPT based Single Phase Stand Alone Photo Voltaic System using Particle Swarm Optimization Technique.	ijetch.org	https://www.sciencedirect.com/journal/index.php/ijet	UGC care list serial No. 45550

UG Programs- Engineering: Chemical, Civil, Computer, Electrical, Electronics & Telecommunication, Mechanical
PG Programs - Engineering: MCA,
- Management: MBA.

Development and Modelling of Automation of Plastic Mat Cutting Machine	https://www.ripublication.com/ijaer.htm	https://www.ripublication.com/ijaer/2018/ijaerv13n5spl_08.pdf	UGC Approved Journal no 63975, SCOPUS, EBSCOhost, GOOGLE Scholar, JournalSeek, J-Gate, ICI, Index Copernicus
SOLID WASTE MANAGEMENT BY VERMICOMPOSTING	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed UGC Approved Journal no 63975
Industrial Water Distribution Network Design and Analysis: A Case Study	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed UGC Approved Journal no 63975
Study of Solid Waste Management: Case Study for Khamsan City	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
ELECTROCOAGULATION OF WASTE WATER BY USING IRON AND ALUMINIUM ELECTRODE	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
EFFECT OF CEMENT ON THE HEAVE OF AN EXPANSIVE SOIL	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Removal of Fluoride using iron (Fe ³⁺) and magnesium (Mg ²⁺) calcinated layered double hydroxide (LDH) coated on silica surface as adsorbent	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975

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 PG Program - Engineering: MCA
 -Management: MBA

Impact analysis of air pollution along NH6 through Jalgaon city	https://ijert.org/	DOI: http://doi.org/10.17277/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Wastewater Management in a Sugar Factory	https://ijert.org/	DOI: http://doi.org/10.17277/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Road Aggregates from Industrial Polymer-Waste	https://ijert.org/	DOI: http://doi.org/10.17277/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Thermoelectric Generator System for Generation of Electric Power through Waste Heat Energy from Two Wheeler Silencer	https://ijert.org/	DOI: http://doi.org/10.17277/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Mathematical Model Formulation for Investigation of Influence of Air Induction Pressure as an Operating Variable on a Stationary Compression Ignition Engine Performance	https://ijert.org/	DOI: http://doi.org/10.17277/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Design of Experimental Plan for Effect of Liquefied Petroleum Gas Analysis on Friction Power Loss in Spark Ignition Engine	https://ijert.org/	DOI: http://doi.org/10.17277/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Performance Analysis of Hot Water Storage Tank in Solar Water Heating System with Different Insulation Using ANSYS	https://ijert.org/	DOI: http://doi.org/10.17277/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975

IMPROVEMENT IN DESIGN OF FLYWHEEL TO INCREASE EFFICIENCY OF HUMAN EFFORTS TO GENERATE ELETRICITY	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Study of Closed Loop Control for AC Motor Using Matrix Converter: A Review	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Off-Line and On-Line Handwritten Character Recognition A Survey for Indic Script	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Combined Effect of Pour Point Depressants and Magnetic Field on the Viscosity and Pour Point of Crude Oil	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Optimization of ZIF-8 Filler loading in Mixed Matrix Membrane for Gas Separation by Permeation Models	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Acoustic cavitation Coupled with Advance Oxidation Process for Treatment of Dairy Industry Wastewater	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
A Review on Treatment of Sewage Water & Biogas Purification by Algae	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Separation of Azeotropic Solution of Ethyl Acetate-Ethanol by Cobalt Nitrate	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975

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PG Programs - Engineering: MCA
- Management: MBA

Fermentation Kinetics and Ethanol Production from Different Corn Grains Varieties	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Production of Metal Nanoparticles By Microbial Fermentation	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
MOBILITY in WIRELESS NETWORK with NAMED DATA NETWORKING	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
WORD SENSE DISAMBIGUITION FOR DEVNAGARI LANGUAGE	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
NLP Based Clinical Data Analysis for Assessing Readmissions of Patients with COPD	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Two Layer Artificial Immune System for Intrusion Detection System	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Study and Review on Advanced Layer Protocols in IoT Application	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Study and Review of Hybrid Approach for Privacy Preserving Data Mining	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975

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 - Management: MBA

Study on Implementation of Distributed and High Capacity Hybrid Wireless Network Using Three-hop Routing Protocol	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Parallelism: A New Approach in Prediction System	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
A Review on Implementation of Sandhi Viccheda for Sanskrit Words	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
The Study and Review of Detection of Sensitive Data Leakage for Privacy Preserving	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Continuous User Identity Verification Using Biometric	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
TEXTUAL SIMILARITY DETECTION-A SURVEY	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
ISOLATION PRODUCTION AND POTENTIAL APPLICATION OF BIOSURFACTANT- A Review	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
MATLAB SOLUTIONS FOR HEATING AND COOLING EFFECT OF A THIN ANNULAR DISC	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975

UG Programs- Engineering: Chemical, Civil, Computer, Electrical, Electronics & Telecommunication, Mechanical
PG Programs - Engineering: MCA
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Assessment of Mass Awareness and Willingness for Environmental Protection	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Impact on Health due to Air Pollution: a case study of Jalgaon City	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Study of Rotating Biological Contactors (RBCs) for Wastewater Treatment Process	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
EXPERIMENTAL STUDY ON PERFORMANCE OF COMPOSITE BEAMS	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
A Study of Goods & Services Tax (GST) & Its Impact on India: Review	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Customer Based Brand Equity: A Review of Literature	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Managing Technological Advancement with Strategic Management to Gain Competitive Advantage	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
"FOOD SAFETY: CHALLENGES & OPPORTUNITIES TOWARDS STREET FOOD MARTS: A CASE STUDY FOR JALGAON CITY"	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975

UG Programs - Engineering: Chemical, Civil, Computer, Electrical, Electronics & Telecommunication, Mechanical
PG Programs - Engineering: MCA
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MODIFIED MULTI – MEDIA FILTER FOR DOMESTIC WASTEWATER TREATMENT	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Design and Development of Human Operated Flywheel to Generate Electricity	https://ijert.org/	DOI: http://doi.org/10.1727/IJERT.17121	UGC Care listed, UGC Approved Journal no 63975
Customer Based Brand Equity In Relation to Automobile Brands: A Review of Literature	http://www.dynamicepublisher.org/	DOI: http://doi.org/10.1727/IJERT.17121	J-Gate Portal, CitiseerX
Year 2016-17			
Single Stage Forward-Flyback Converter for Improvement in Performance	https://ijesc.org/	https://ijesc.org/	Peer Reviewed
High Efficiency H6 Transformer less topology based Single Phase Full Bridge PV Grid tied Inverters	https://www.journals.alajst.com/	http://sifactor.com/passport.php?id=17902	Google scholar
A Review of Power Quality Improvement by Using Active Power Filters	https://www.ijmra.us/ijournal.php	https://www.ijmra.us/ijournal.php	UGC listed
DC Line-to-Ground Fault Analysis for VSC Based HVDC Transmission System	https://ijritec.org/index.php/ijritec	https://ijritec.org/index.php/ijritec	Thomson Reuters
A Review: Reconfigurable Solar Converter – A Single Stage Process	http://www.ijstmr.com/	http://www.ijstmr.com/	Citefactor index
Enhancement of Power Quality in Grid Connected Photovoltaic System Using Predictive Current Control Technique	https://ijritec.org/index.php/ijritec	https://ijritec.org/index.php/ijritec	Thomson Reuters




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UG Programs- Engineering: Chemical, Civil, Computer, Electrical, Electronics & Telecommunication, Mechanical
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Screenshots of Paper published in the Journals notified on UGC website during 2020-21

IOP Conference Series: Materials Science and Engineering

PAPER - OPEN ACCESS:

Effect of pour point depressants and diluents on exergy destruction during pipeline transportation of crude oil

To cite this article: A D Kulkarni and K S Ware 2021 IOP Conf. Ser.: Mater. Sci. Eng. **1163** 012004

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Effect of pour point depressants and diluents on exergy destruction during pipeline transportation of crude oil

A D Kulkarni¹ and K S Wani²

¹ School of Chemical Engineering, Dr. Vishwanath Karad MIT World Peace University, Pune, Maharashtra, India

² Department of Chemical Engineering, SSBT College of Engineering and Technology, Bambhori, Jalgaon, Maharashtra, India

E-mail: anand.kulkarni@mitwpu.edu.in

Abstract. Exergy destruction in pipeline flow of crude oils mixed with pour point depressants (PPD) and diluents has been investigated. Ethylene vinyl acetate with vinyl acetate content of 18% and 28% (EVA-18 and EVA-28) and Polymethyl methacrylate (PMMA) with concentrations of 200 ppm, 1000 ppm and 1500 ppm were chosen as the PPDs for this purpose. Four different diluents were considered viz. *n*-hexane, cyclohexane, *n*-butanol and toluene representing paraffins, naphthenes, alcohols and aromatics respectively. The viscosity reduction was found out experimentally. Using these results for a hypothetical pipeline, the effect of API gravity of crude oil, pipeline diameter, Reynolds number, PPD concentration and diluent type on exergy destruction was investigated. These findings would help in making a prudent choice of PPD and diluents for efficient transportation of crude oil through pipelines.

1. Introduction

Pumping of viscous crude oil for long distance transportation results in major energy consumption [1]. It leads to high operating costs and hence overall economic loss. Pumping process is highly irreversible. Detailed second law analysis of this process is highly essential to identify the irreversibilities and reduce the same. These irreversibilities can be due to friction, heat transfer, concentration gradient, mixing or chemical composition. Such irreversibilities can be measured with the help of exergy. Exergy is the maximum amount of useful work that can be obtained in a given environment [2]. The more the irreversibility, greater is the reduction in the exergy and the more the exergy loss, higher is the consumption of energy that drives the process. Hence the exergy analysis of a process gives better insight into the energy consumption and subsequently the economic loss.

Exergy can be classified into physical and chemical exergy. The exergy due to heat, pressure and flow can be considered as physical exergy whereas the exergy of chemical reaction and mixing comes under chemical exergy. Physical exergy is a function of temperature, enthalpy, entropy and hydraulic resistance whereas the chemical exergy is mainly a function of the Net Heating Value (NHV) and the mole fraction of the components. In case of crude oil, these factors are more pronounced due to the changes in wax precipitation behaviour at different ambient conditions. Cheng [3] has studied the effect of wax deposition on physical and chemical exergy of a crude oil pipeline in China.

Protection of the Environment along the NH-6

Arvind R. Kale¹ Dr. Mujahid F. Husain²

¹Research Scholar

²Professor and Head of Department of Civil Engineering, SSBT'S College of Engineering and Technology, Bambhori, KBCNMU, Jalgaon

¹arvindkale2010@gmail.com, ²ernujahidhusain@yahoo.com

Abstract

Environmental pollution is currently the biggest challenge facing the world today. Over the years environmental issues have gained a lot of public attention. People have become more aware that consumption of products and the services rendered have an impact at each stage to the natural resources. Due to the increasing awareness, the public and private sectors have started taking a keen interest in reducing the adverse effects, and in evolving methods for prevention of these impacts. In particular, sustainable development is becoming the goal for a lot of countries. There are many sources of pollution and each one has its own effect on the environment and living organisms. The study of sustainability of project is must to have the knowledge about short-term, medium and long term effects of roads/highways on the environment must be enhanced. Environment and social issues need to be addressed as integral parts of project planning and implementation rather than an isolated studies and future vision should focus on achieving long-term environmental, social & economic sustainability. This article will discuss the environmental impact of the different kinds of pollutants with special reference to NH-6 in Khandesh Region.

Keywords: Environmental Impact, Sustainability Pollution, Awareness.

Introduction

Development of adequate and efficient infrastructure has been recognized as a key to economic development of the country. The national highway is the main component of infrastructure. The developments of national highways are likely to have adverse impacts on environment if these are not planned properly and the required safeguard measures are not built during their construction phase. The development process of highways will be sustainable and able to deliver its benefits to the public if environment considerations and rational utilization of resources are integrated into projects right from the initial stage of planning to construction, operation & maintenance. The infrastructure developments such as roads and highways play a synergistic role in the socio-economic development of a country. Inadequacy of road infrastructure is realized to be the inhibiting factor for the development of our economy [1].

Environmental impact assessment (EIA) can be defined as the systematic identification, evaluation of the potential impacts (effects) of proposed projects, plans, programs, or legislative actions, relative to the physical, chemical, biological, cultural, and socioeconomic components of environment. The following should be considered in evaluating the severity of the impact. a. Impact that may be both beneficial and adverse (A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial) b. The degree to which the proposed action affects public health or safety c. Unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, ecologically critical areas d. The degree to which the effects on the quality of the human environment are likely to be controversial [2]

Environmental impact assessment (EIA) is a complex issue as it seeks to determine the best components responsible for the overall environmental burden of the project/activity so as to recommend suitable measures to mitigate these impacts. The evaluation of impact significance is considered one of the most difficult, critical and vital element of the process. There are many tools and techniques that have facilitated the impact assessment processes such as scoping, checklists, matrix, qualitative and quantitative models, literature reviews and decision support systems [3,4]. There is also a vast multicriteria decision-making literature, which deals with EIA problems and application of multicriteria assessment (MCA) methods to support complex environmental decision making has gained great interest in the last decades [5-7].

Therefore, in the coming ten years the road development programs in India is likely to proceed at a faster pace. Road development can have wide ranging environmental impacts compared to many other developmental projects. This is because roads extend over long distance and by promoting

BARRIERS TO TQM IMPLEMENTATION IN MSME -SPECIAL REFERENCE TO JALGAON MIDC

M.V. Rawlani

Research scholar, Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon, MS, India.

Dr. A.M.Vaidya

Principal, Gangamai College of Engineering, Nagaon, Dhule, MS, India.

Dr. Mujahid Husain

*Professor and Head, Civil Engineering Dept., SSBT's College of Engineering & Technology, Jalgaon, MS, India.***ABSTRACT**

Most of the MSMEs have inadequate implementation of modern technology compared to large enterprises. Therefore, management technique i.e. TQM has been introduced to implement in MSMEs for establishing a good quality management system, developing human resources and increasing business performance. Despite the reasonable benefits of total quality management (TQM) joined by quality specialists and practitioners, these benefits are difficult to achieve in practice. Many MSME has found it difficult to implement TQM successfully. This research was conducted in MSMEs in JALGAON. The purpose of this paper is to understand TQM barriers and prioritize their relative importance by ranking them in the MSME. The questionnaire was used as a tool for collecting data in this research. This section indicates certain presumable difficulties acting as a barrier in implementing TQM principles. 8 presumable difficulties were mentioned in the questionnaire and response was to be given about the degree of agreement on a five-point scale. It was observed that 'resistance to change' was considered to be the most significant barrier in the way of TQM.

KEYWORDS: TQM, BARRIERS, MSME**INTRODUCTION**

Small scale sector provides approximately 40% of the state's GDP. It accounts to nearly 40% of our industrial output, nearly 6% of GDP, and 35 % of national exports while employing nearly 30 million people. The small scale sector in India covers several manufacturing over 8000 products, from conventional to high-end technical instruments. Owing to the feeling that the small scale sector was an important tool in employment generation, value creation and poverty alleviation (M.V.Rawlani et al. 2016). At present there is too much competition between industries regarding price, cost, and quality. There are various problems in industry such as lack of skilled workers, improper material inventory system, improper utilization of material, lack of training facilities, improper layout, deficiencies of safety equipment. TQM'S tools are the main tools that will be applied to this study. TQM is a management philosophy that seeks to unite all organizational functions (finance, design, engineering, and production, marketing, customer service, etc.) to focus on meeting customer needs and organizational goals. The purpose of this study is to review the difficulties experienced in the implementation of TQM leads in MSME in JALGAON. This study provides insight into the difficulties experienced in implementing TQM. Such knowledge offers opportunities to organizational decision-makers and human resources practitioners to plan proper intervention policies to offset these barriers to achieve a high success rate of TQM implementation. The results of such insights and compatible response strategies are likely to improve the success rates of TQM initiatives in JALGAON. The study also provides opportunities for academicians to search the dynamics of these barriers to further extend the knowledge in the area of TQM implementation in MSMEs in emerging economies.

Domestic Wastewater Treatment using Coconut Husk as Adsorbent

Farooq I Chavan SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India,
Email Id: farooqamaravati@gmail.com

Mojahid Husain SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India,
Email Id: gmujahidhusain@yahoo.com

Pravin A Shirute SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India,
Email Id: profilpatil007@gmail.com

Abstract

From the inception of the corona virus pandemic for the more than a year, it has now become exigent that the water supplies and wastewater be treated at its fullest efficiency as their nexus is quite ubiquitous in this domestic society. To design a robust wastewater treatment incurs a hefty cost, so the need of the hour is to resort towards treatment techniques which incur minimal cost and adsorption techniques are one of them. Adsorption is a process where contaminants or compound in one phase gets attached or condensed to other phase, finally removing them. Adsorption by using activated carbon is a prominent method to remove the contaminants from water and wastewater remarkably, but still many researches shows the same as expensive and therefore, low cost adsorbents extracted naturally is a best and cheapest alternative to remove the same. Numerous researches showed the potency of such low cost adsorbents in removing heavy metals, dyes etc. from the wastewater, but there is no literature available pertinent to the removal of parameters viz. COD, BOD etc. from the wastewater. The present research aims to study the alteration of functional parameters viz. Adsorbent Dosages and pH in the removal of COD by comparing its efficiency supplemented with batch adsorption studies on the low cost adsorbents viz. Coconut Husk.

Keywords: Wastewater, Coconut Husk, COD, pH, Adsorbent Dosages.

1. Introduction :

Now as the world is grappling through the ferocious sub sequential wave of Coronavirus pandemic for more than a year, it is exigent that all types of wastewater and water is treated with efficiency at its fullest, as the nexus between the two is ubiquitous in our domestic society. One question might be pondering over one's head is that can wastewater treatment be carried out by incurring minimal cost for the same? The answer to this question lies in the nature itself, that is, by making use of natural materials to adsorb the contaminants present in the wastewater which in turn will reduce the likelihood of the impairment of the quality of ground water which is mainly used for irrigation (Bokil et al, 2005). Adsorption is basically the process in which contaminants present in one medium or phase tend to condense and concentrate on the surface of other face, wherein the material being concentrated is adsorbate and the adsorbing solid is called as adsorbent (Sawyer et al, 2003). Numerous works proves the simplicity and the audacity of the adsorption process (Reza KM et al, 2015). Adsorption is mainly used in the conventional wastewater treatment to remove the color, organic pollutants and other contaminants present in the wastewater with Activated carbon as one of the prominent adsorbent. Despite of its remarkable properties, still many found it as expensive and the exigent need of the hour is to resort towards the adsorbents that incurs minimal costs. In this regard many researchers have made their fruitful contributions by utilizing numerous substances viz. agricultural wastes, coir pith, banana pith, sugarcane dust, sawdust etc. (Pandhare Ghanshyam et al, 2013). The study of such low cost adsorbents has been extensively carried out by numerous researchers viz. Study of Dye removal from textile wastewater using hardwood, saw dust and charcoal (Asfour et al, 1985), study of removal of toxic metal chromium using low cost rice husk (Mullick et al, 2017), study of dye removal by using timber wastes as adsorbent (Garg et al, 2004). The development of low cost adsorbents based on lignocellulosic agricultural waste has gained prominence in the recent times and also for the past two decades and extensive research work on the same exhibited the highest adsorption capacity in removing the heavy metals from wastewater

Reuse of Lathe Scrap Steel and Waste Fine Scrap Rubber Tyre in Concrete

Pravin A. Shirule, Civil Engineering Department, S.S.B.T's College of Engineering & Technology, Jalgaon, 425001, India

Mujahid Husain, Civil Engineering Department, S.S.B.T's College of Engineering & Technology, Jalgaon, 425001, India

Abstract

As construction industries are increase day by day the requirement of concrete is also increase. But there is scarcity of natural material like sand required for concrete. On the other hand as use of vehicles is increase so there is huge increase rubber tyre also, this will produce fine scrap rubber in large volume during remolding process. In industries lathe machine scrap steel waste also produce. This research work develops the use of such waste in concrete and replacement of sand. Fine rubber aggregates are used to replace by 3%, 6%, 9%, 12% and 18% of sand and same % of lathe machine steel scrap are added in concrete mix. To find effect of these replacement and addition on the properties of fresh concrete and hardened concrete mixes, a number of laboratory test carried out. These tests included workability, unit weight, compressive strength, flexural strength, and indirect tensile strength (splitting). The main findings of research is that the fine rubber aggregate and same % of lathe machine scrap steel enhance the hardened concrete properties up to certain proportion.

Keywords: Lathe machine scraps steel, Scrap fine rubber, Concrete, Sand, Environmental nuisance.

1. INTRODUCTION

Utilization of industrial waste products in concrete has attracted attention all around the world due to the rise of environmental consciousness. The waste of one process is in fact a raw material for some other process.

At same time the exponential growth in number of automobiles in India during recent years, the demand of tyres as original and as its replacement has also increased. In India the total tyre production of all vehicles in past two years is as follows: [1]

2009 – 10 - 97.137 lakh,

2010 – 11 – 119.197 lakh

2011 – 12 – 125.397 lakh.

Tires that are not recycled or reused are usually shredded and disposed of in landfills, or stockpiled whole. Stockpiling whole tires creates two significant hazards: mosquitoes and fires. Due to their shape and impermeability, tires managed in stockpiles tend to hold water for long periods of time. This stagnant water provides an ideal breeding ground for mosquitoes and sites for mosquito larvae development. Tire stockpiling has contributed to the introduction of non-native mosquito species. These new mosquito species are often more difficult to control and spread more disease.[2] If tyres are burnt under conventional uncontrolled fashion, 34 target compounds representing the highest potential for health impacts are produced.[8]. The major source of the aqueous contamination was attributed to automobile tires that served as a source of fuel for the German cement industry. High levels of zinc and cadmium were detected in the Rhine River near Bonn and Strasbourg, Germany in 1988. The river received the metals through air deposition from the burning of tires and storm water runoff from roads which accumulated the metals through tire wear.[9] If the waste tires are dumped on agriculture lands it's polluted with heavy metals such as cadmium. It is found to affect soil pH too. Abandoned agricultural land polluted with heavy metals has an enhanced uptake of heavy metals in new vegetation. This could harm wildlife and increase leaching to groundwater for drinking-water supplies.[9] Tire storage and recycling are sometimes linked with illegal activities and lack of environmental awareness.[15] The use of rubber in aggregate also gives soft surface. It can be used where light weight is important than strength criteria such as partition wall, compound wall, etc. from the results of replacement of natural aggregate by scrap tyre are useful for application studies like pavements, dancing hall and footpaths.[12] In some

Permeability of Rubbercrete: Effect of Aging

Sonali B. Patil Civil Engineering Department, SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India

A Mujahid Husain Civil Engineering Department, SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India.

Email Id: borsep14@gmail.com, ermujahidhusain@yahoo.com

Abstract

Research investigations in the recent past have established the use of rubbercrete in non- structural concrete members. It is getting popular owing to several reasons. However the research literature has yet not reported much about endurance of rubbercrete. The present work is an attempt to assess the long term performance of rubbercrete taking permeability as a reference parameter. Permeability of rubbercrete obtained by replacement of fine as well as coarse aggregates respectively in proportion of 10%, 25%, 33%, 50%, 66% and 75% by weight has been assessed experimentally for duration 28 days, 6 months, 1 year and 2 years. Plain concrete is taken as reference. It is found that the aging leads to significant increase in permeability, thus a serious loss of durability of concrete.

Keywords: Rubbercrete, permeability of rubbercrete, endurance assessment, long term performance, durability of rubbercrete.

Introduction :

Invention of cement concrete is one of the prime revolutions in the history of civilization. Presently the naturally available ingredients of concrete, sand and gravel, are diminishing. Their over exploitation is posing environmental concerns. On the other hand, disposal of scrap rubber tyre is also an important environmental concern [4, 5]. Rubbercrete – a concrete in which coarse and/or fine aggregates are replaced by rubber- is a single-shot solution to both the problems. The concept of rubbercrete is around three decades old [13]. A great deal of research has been done on rubbercrete. Researchers have explored various aspects of rubbercrete. It has been a general understanding that rubbercrete is suitable for non structural members with the added advantage of light weight [12].

As the use of rubbercrete is getting popularity, it is the high time to assess the endurance or long term performance of the material. Concrete is a material having expected life time of over a century. Rubbercrete is having rubber particles imbibed in concrete. The behavior of rubber in the environment of concrete, which is exposed to atmospheric heating and cooling cycles, freezing and thawing phenomenon, moisture variations and of course stresses is still a green area for researchers. This aspect is investigated in the present work. Here, water permeability is taken as a parameter for concrete durability [1, 2, and 11]. Durability is inversely linked with permeability. Rubbercrete is prepared with proportions of rubber varying as 10%, 25%, 33%, 50%, 66% and 75% is prepared. Both the coarse and the fine aggregates are replaced alternatively. The cubes are tested for their water permeability for 28 days, 6 months, 1 year and 2 years of atmospheric exposure. Jalgaon city (21^oN, 75.5^oE), where the experiments are performed, has vast spectrum of seasonal variation with minimum and maximum temperatures respectively 5^oC and 45^oC. The rubbercrete specimen are exposed this extreme weather and then tested for permeability. Their performance is compared with the 0% rubbercrete (plain concrete). It is found that the permeability significantly increases with increase in rubber proportion. For a given rubber proportion it increases significantly with aging of concrete. This may be attributed to the decay/decomposition of rubber with time.

The rubber proportions are varied between 10% to 75%. This is so because researchers have found 10% rubber in concrete as acceptable in most case while they have suggested use of high proportion rubbercrete for simple applications like partition walls, insulating walls etc [9].

Design and Implementation of High Voltage Power Supply Using Flyback Converter with EHT for Electrospinning System

P. H. Zope

Department of E&TC, College of Engineering and Technology, Bambhori, Jalgaon, India

Dr. S. R. Suralkar

Department of E&TC, College of Engineering and Technology, Bambhori, Jalgaon, India

ABSTRACT

In this study the generation of high voltage for electrospinning application is presented, the low cost design and implementation of the high voltage power supply using flyback converter with Extra High Tension(EHT) with its control circuit is discussed. The flyback converter is used as DC-DC converter of maximum wattage 130W its output is connected through control and switching circuit to the back to back connected two SCR with EHT to operate electrospinning setup. The high voltage power supply design of rating 100V to 40KV with current rating between 10mA to 150mA is obtained at the output of EHT. The result discusses the elimination of high-frequency ringing problem and the flyback converter switching between the discontinuous current mode (DCM) and continuous current mode (CCM). The complete calculation of design components and their testing of the flyback converter along with the EHT circuit are presented.

Keywords: High voltage power supply, Electrospinning, Flyback, Extra High Tension (EHT)

1. INTRODUCTION

Electrospinning system is the mechanism to fabricate very fine fiber which is used in cotton, biomedical, filter, electronics devices, solar cell and medical application; it uses very high electric field to produce these fine fibers [1]. The system is composed of high voltage direct current (DC) power supply, electronic syringe pump and a rotating or stationary collector drum / plate. The high voltage source needed for electrospinning system varies depends on synthesis condition, usually from 5kV to about 30kV. In this design the high voltage DC power supply of rating 100V to 40kV with maximum output current 20 mA is used to generate a high electric field to obtain proper synthesis condition between a droplet of the solution at the tip of a needle fixed over the electronic syringe pump and a rotating collector drum / plate. The studies of the researchers highlight various ways to obtain the high voltage using voltage doublers, Cockcroft-Walton's Voltage Multiplier, Marx Generator, Tesla Coil and Flyback Converter [2].

The 32-stage voltage multiplier generate 12KV DC power supply using Cockcroft-Walton technique [3], the output voltage linearly increases and reaches to this range. Some high voltage power supply generates analog square wave output which is necessary in the field of electronics and electrical engineering and applied physics, such as X-rays, electrostatic precipitator, defibrillator in a medical lab, defense shield, electron microscopes, dielectric testing, particle accelerator in nuclear physics, stunt gun [4]. The Cockcroft-Walton voltage multiplier circuit shows the ratio of output voltage to input voltage for one stage. As the number of stages increases it will generate high voltages in order of several KV. The Cockcroft-Walton voltage multiplier is isolated from the main line which results in the mitigation of switching surge voltages [5].

The research paper highlight Cockcroft-Walton and Van Der Graff circuits are simplest and easiest voltage multiplier circuit is an electrical circuit that converts AC electrical power from a low voltage to a high DC voltage, typically by means of a network like voltage doubler, tripler, quadrupler and n-plexer they are constructed using capacitors and diodes [6] similarly the required amount of high



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Experimental investigation of thermoelectric generator system

P.M. Solanki^a, D.S. Deshmukh^b, V.R. Diware^c, M.S. Deshmukh^d

^a K.J.SOMAIYA Jalgaon, Maharashtra 425001, India

^b G. H. Bhatnagar College of Engineering, Dighori Hill, Nagpur, Maharashtra 440021, India

^c Chemical Engineering, SSBT's COET, Jalgaon, Maharashtra 425001, India

^d AECMS, College of Engineering, Pune, Maharashtra 411001, India

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ABSTRACT

This was accomplished by mathematical models for the dependent Pi terms in the quantitative data-based modelling. This aims to use dimensionless analysis to figure out what factors influence the efficiency of a thermoelectric generator device (TEG). Simple mathematical models were developed based on actual experiments in this research work to predict the pattern of voltage, current, and power generated in TEG modules. These mathematical models are one of the most effective ways to explain experimental findings and gain a better understanding of the experimental method under study.

We often find ourselves in the situation of having to verify if data matches an equation while testing mathematical models against data. Experimental studies rely on experimental principles to explain which components are the most relevant, and they are based on observation to draw conclusions on how an experimental system performs well or not. Making the necessary observations without disrupting the experimental setup, however, can be difficult. The aim of this study is to see how the independent variables affect the dependent or response variable. An artificial neural network is used to model the mathematical formulation of the device that includes the TEG module (ANN). By intentionally making local changes in their thermoelectric generator experimental set-up, this experimental modelling and ANN simulation approach allows them to obtain a system-wide view. The development of logarithmic best fit mathematical models is used to evaluate the effects of the experiments. Different scatter graphs were plotted in this study to show the output of the dependent variable (current I_{DC} , experimental, model, and ANN) vs. the independent variable relative to the heat source Q_H .

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1. Introduction to TEG

For many years, the basic theory and operation of thermoelectric-based systems has been developed. Thermoelectric power generation is based on Thomas Seebeck's discovery of the "Seebeck effect" in 1821 [2]. Seebeck voltage is produced when a temperature difference is formed between the hot and cold junctions of two dissimilar materials (metals or semiconductors). In reality, thermocouples, which are widely used for temperature measurement [1], are affected by this phenomenon.

In the Fig. 1, heat is shifted at a rate of Q_H from a high temperature. The heat source is held at T_H to the hot junction, and the rejected heat rate of Q_C is kept at T_C to the low temperature sink. The electric current flows in the circuit as a result of the heat supplied at the hot junction, producing electrical voltage [5].

1.1. Thermoelectric generator System:

Fig. 2, depicts the components and configuration of a traditional single-stage thermoelectric power generator. It is made up of two ceramic plates that serve as a mechanical integrator and an electrical insulator for n-type (electrons) and p-type (excess holes) semiconductor components. The charge and electron carriers are carried by the thermoelectric material. Traditional thermoelectric devices range in size from 3 mm² by 4 mm thick to 75 mm² by 5 mm thick. The length of the majority of the module does not exceed 50 mm [5] due to mechanical considerations.

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An innovative design approach of hot water storage tank for solar water heating system using artificial neural network

Mahesh.V. Kulkarni ^a, D.S. Deshmukh ^b, S.P. Shekhawat ^{c,*}

^a Department of Mechanical Engineering, SSBT's College of Engineering and Technology, Jalgaon - 425 001, MS, India

^b Department of Mechanical Engineering, GHRB's College of Engineering, Nagpur - 440016, MS, India

^c Department of Mechanical Engineering, SSBT's College of Engineering and Technology, Bambhori, Jalgaon - 425 001, MS, India

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ABSTRACT

Overall Conductance is considered to be the most important parameter to design hot water storage tank. This is computed in terms of equivalent thermal resistance considering the total heat loss from hot water storage tank. Computed results attained have been confirmed with an Artificial Neural Network (ANN) with three design input data. The back-propagation learning algorithm with the Levenberg–Marquardt (LM) was used in the artificial neural network with 608 known values. Thus, the network was prepared to provide various possible designs of hot water storage tank quickly and accurately. A maximum error of 2.62% was obtained with an ANN. Therefore, proposed innovative design approach can successfully be used for the designing of Overall Conductance of hot water storage tank in solar water heating system. In present work total 612 design combinations used which includes the diameter of the tank, thickness of insulation and conductivity of insulating material.

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1. Introduction

One of the most important design parameter of hot water storage tank in solar water heating system need to be determined accurately namely Overall Conductance of hot water storage tank. Algorithmic programs basically consider Diameter of hot water storage tank, Thickness of insulation, and conductivity of insulating material to perform calculations using complicated differential equations, which predict the design of system Overall Conductance parameters. GERARD E. Johns et al. 1979 developed a simple and effective insulation design method for solar water heating system piping & hot water storage tank. In development of method, a numerical sensitivity analysis was performed to determine relative effect of all relevant independent variable [1]. SOTERIS A. KALO-GIROU et al. 1999 developed an ANN network that trained experimental data and after successful trained predict performance very fast and accurately. ANN can be used in different application and it is very powerful tool to modelling and simulation of system [2]. Soteris A. Kalogirou et al. 2004 described genetic algorithm in an

ANN to optimize solar water heating system [3]. Soteris A. Kalogirou et al. 2006 Predicted performance parameters of flat-plate collector using artificial neural networks Solar Energy [4]. Soteris A. Kalogirou 2000 explained Performance prediction of a solar water heater using artificial neural networks [5]. Naveen Sharma et al. 2012 described application of Artificial neural networks in different solar based thermal systems [6]. The thermal loss to the surrounding is an important factor in the study of the performance of a solar water heating system. These losses took place by conduction, convection, and radiation. The equivalent losses in terms of thermal resistance circuit have been shown [7] & [8]. M.V. Kulkarni et al. 2017 [9] developed an innovative Flat Plate Collector and Storage Volume for enhanced thermal stratification performance of hot water storage tank. The aim of this study is to investigate the suitability of computed Overall Conductance in terms equivalent thermal resistance considering total heat loss from hot water storage tank for 612 design combinations. This is considered to be the most important both to a system designer and the end user (owner of the system). The trained network could then be used as a design tool for designing Overall Conductance of hot water storage tank in solar water heating systems. This would make easy the work of design engineers in the field.

* Corresponding Author.

E-mail address: mshimab@gmail.com (M.V. Kulkarni).

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BENEFITS DERIVED BY MSMEs THROUGH IMPLEMENTATION OF TQM-WITH SPECIAL REFERENCE TO KHANDESI

MV Rawland

Dr. AM Naitlyu

Abstract

In the present era of globalisation, small and medium scale manufacturing enterprises in India are facing intense competition. This paper presents a case study conducted for MSMEs, Small & Medium Enterprises (SMEs) situated in Jalgaon (KHANDESI, North Maharashtra Region). The study is conducted through a survey applying the Total Quality Management (TQM) concept to 110 respondent firms in the same category of MSMEs and by building an analytical model. Key factors like overall performance, customer satisfaction, employee satisfaction, human quality and market share were dealt and are presented in this paper.

Keywords - MSMEs, TQM, Productivity.

1. INTRODUCTION

Small scale sector contributes to approximately 40% of the GDP of Maharashtra State. It accounts for almost 30% of our industrial output, about 6% of national GDP, 35 % of national exports while employing approximately 30 million people [1]. The small scale sector in India is very diverse, manufacturing over 8000 products, from conventional handicrafts to high-end technical instruments. There is an evident belief that a small scale sector is an important tool in employment generation, value creation and poverty alleviation. Maharashtra is an industrial backbone of our country. It contributes to around 21% of our country's industrial output. The average share of the state's contribution is highest (14.3 percent), amongst all other states in All-India nominal GDP. Nominal Gross State Domestic Product (GSDP) is expected to increase by Rs. 2,45,791 crores during 2019-20 as compared to 2018-19. Per capita, state income during 2019-20 is expected to be at Rs 2,07,727 [2]. Maharashtra is divided into 36 districts, which are further divided into five regions viz., Vidharbha, Marathwada, Northern Maharashtra (Khandesh), Western Maharashtra and Konkan. Out of these, Khandesh lags in industrial development, as compared to Western Maharashtra. Some of the causes could be lack of industrial culture, lack of quality awareness, lack of knowledge of industrial management, lack of risk-taking attitude, etc. So the said region is selected for study as a target area. The aim of this study is to improve the productivity of industries in the region of Northern Maharashtra (Khandesh). TQM- tools are important tools that will be applied in this study. Majority of successful manufacturing companies have embraced Total Quality Management (TQM) strategies and realized its invaluable contribution. [3] [4] [5] [6] [7]

2. LITERATURE REVIEW

Ten essentials for successful business i.e. customer-centered organization, customer-centered leadership, customer-centered strategy, management of people, training and developing people, management of resources, process control, and improvement, customer satisfaction, employee satisfaction and community

satisfaction are presented [8]. A research paper [9] that deals with the help of a survey of ISO & non-ISO manufacturing firms of Karnataka & Maharashtra concluded that Small & Medium Enterprises (SMEs) act as a vital component of a growing economy. They contribute significantly for the development of the economy by creating employment for both urban and rural workforce and by providing much-needed flexibility and innovation in the economy as a whole. If TQM policies and practices are applied positively in manufacturing SMEs, they will contribute significantly to the performance in terms of quality and customer satisfaction. The existing status of TQM practices in 112 SMEs (manufacturing firms) of China and its impact on their performance is investigated [10]. It was found that the manufacturing processes of these small firms were not an obstacle to the implementation of TQM, but it was the size of a firm, which posed a threat to its implementation. Research showed that the majority of the firms were new to TQM practices and that it was initiated by their top management. A positive influence of TQM was observed on performance as waste, inventory and costs were reduced and an increase in sales was observed. In the same manner, the performance of SMEs was observed in Malaysia by [11] and in India by [12]. A process model was proposed, that employed the Analytic Hierarchy Process (AHP) methodology to acquire and analyze industry practitioners' opinions among the stages and related sub-criteria that would determine the success of TQM implementation. The empirical data was collated and practitioners' opinions were analyzed to determine the present weightings of performance criteria, sub-criteria and benefits of TQM implementation in SMEs is proposed in [13]. The workstation for deburring process tasks should be designed so that any woman worker can adjust to her comfort to work and improve efficiency. The ergonomically designed workstation is a solution to productivity problems in the workplace that has been concluded in [14]. [15] Various benefits are derived as a result of enacting TQM principles by the firms. The greatest benefit is the reduction in the number of products/service defects, errors or failures; and with this, customer satisfaction has shown improvement. The other benefits in



Full Length Article

Optimization of diesel engine performance and emission parameters of Karanja biodiesel-ethanol-diesel blends at optimized operating conditions

Krishna Shrivastava^{a,*}, S.S. Thipse^b, I.D. Patil^c

^a SBT's CETET, Bambhori, Jalgaon, India

^b Power Train Engineering, AECU, Pasa, India

^c SMAC College, Mahal Nagan, Jalgaon, India

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ABSTRACT

This study reviews Karanja biodiesel, ethanol and diesel blending in context of Indian subcontinent and also focuses on its effects on engine's performance, emission and combustion responses. Experimentation carried out on four stroke single cylinder diesel engine at constant speed 1500 rpm and injection pressure 210 bar. The four input parameters as injection angle, Compression ratio, Blend % and loads varied to obtain engine responses as Brake thermal efficiency, Brake specific fuel consumption, Exhaust gas temperature, Carbon dioxide, Carbon monoxide, Nitrogen Oxide and hydrocarbon. Taguchi method was applied to optimize the trials using L9 orthogonal array and to get main effects S/N ratio curves, for optimal combination of input parameters to response. The ANNOVA was used to establish the contribution of input parameters to responses. Further single combination of input parameters for all seven responses at Injection Angle 19° CA bTDC, Compression ratio 18, Karanja 55 (fuel blend) and 50% load was obtained by Gray Relational Analysis. Experimentation revealed marginal reduction of brake thermal efficiency about 2%, Brake specific fuel consumption higher by 3%, Exhaust gas temperature increases by 2%, Carbon dioxide increases by 0.56%, hydrocarbon decreases by 12 PPM, carbon monoxide and Nitrogen oxide reduced by 0.029% and 0% respectively when compared with diesel at full load. The combustion parameters as Cylinder pressure, Ignition delay, Combustion duration, Start of combustion, End of combustion, Rate of pressure rise, Mean effective pressure and Net heat release rate were observed at full load, also support optimal combination of input parameters.

1. Introduction

Energy is highly valuable and important for society; it exists in various forms. Economic development grows energy needs, which enhanced the utilization of natural resources such as coal, wood, water etc. apart from fossil fuel in the preceding century. However, rising demand for energy has certain impacts on environmental changes. Hence it has brought attention to develop alternative sources of energy such as bio-fuels. Presently bio-fuels contribution is 9.1% [1]; it may increase in near future due to more dependence on fossil fuel and to

reduce greenhouse gas emissions. New technologies and applications of bio-fuels will be developed and marketed up to 2020 [2]. This study focused on Karanja biodiesel, ethanol and diesel with India as a future perspective. Two National Biofuel policy (NBP) 2009 and the NBP 2018 had been launched with a view to enhance bio-fuel production and blending with fossil fuel [3,4]. As per the prediction on this policy [3], the blend of 10% ethanol is (E10) by 2022 and seeks E20 for gasoline and 5% biodiesel (B5) blend for diesel by 2030. The advancement of technology has consistently increased the viability of these alternative sources to cope with world's energy needs [5,7], in India the non edible

Abbreviations: NBP, National Biofuel Policy; BTE, Brake Thermal Efficiency; BSFC, Brake Specific fuel consumption; EGT, Exhaust Gas Temperature; CO₂, Carbon dioxide; NO_x, Nitrogen Oxide; CO, Carbon Monoxide; SFC, Specific fuel consumption; NHR, Net heat release rate; RPR, Rate of pressure rise; SOC, Start of Combustion; EOC, End of Combustion; ID, Ignition delay; DAQ, Data Acquisition Device; 4 S, four Stroke; VCR, Variable compression engine; IA, Injection angle (°C bTDC); IP, Injection Pressure; CR, Compression Ratio; ASTM, American Society of Testing and Material; L, Level; F, No. of Parameters; N, Number of Experiments to be conducted; L, Number of Level; DoE, Design of Experiment; OA, Orthogonal array; BDE, Biodiesel-Diesel-Ethanol; E20, Ethanol 20 (Biodiesel 5% - Ethanol 5% - Diesel 85%); E25, Karanja 25 (Biodiesel 20% - Ethanol 5% - Diesel 75%); E30, Karanja 30 (Biodiesel 20% - Ethanol 10% - Diesel 70%); GRA, Gray Relational Analysis; SIRFI, Multi response performance index; GRG, Gray relational grade; ANN, Artificial Neural Network.

* Corresponding author.

E-mail address: kshrivastava20@gmail.com (K. Shrivastava).

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Experimental Investigations on Salt Gradient Solar Pond with Additional Non-Convective Zone for Improved Thermal Performance and Stability

D.B. Sadaphale^{1,*}, Dr. S.P. Shekhawat^{2,b} and Dr. V.R. Diware^{3,c}

^{1,2,3}SSBT's College of Engineering and Technology, Bambhori, Post box no 94, Jalgaon 425 001, Maharashtra, India.

*devendra_sadaphale@rediffmail.com, ^bspshekhawat@rediffmail.com,
^cvrdiware65@rediffmail.com

Keywords: Upper Convective Zone, Non Convective Zone, Salt Gradient Solar Pond.

Abstract: Salt gradient solar ponds are to be designed for thermal efficiency and salinity profile stability. As the salt flux moves upward in the pond, the gradient gets destabilized. In order to keep the interface stable; researchers have suggested dividing the Non convective zone (NCZ) into two parts. They have given analysis for the same and found it to be feasible. However, the experimental feasibility of the same needs to be verified. The present work has made an attempt at the same. In this study, an insulated solar pond with a surface area of 1.40 m² and a depth of 1.14 m is built at the SSBT's College of Engineering and Technology, Jalgaon in the Maharashtra State (India). The influence of varying the thicknesses of the zones present in a salinity gradient solar pond on the temperatures of the upper convective zone (UCZ) and the lower convective zone (LCZ) is investigated. Also, it is found that by adding the additional non convective zone of 50mm thickness above the UCZ the heat collection capacity of the LCZ is increased noticeably and attend Maximum temperature of 47°C. The study finds that thickness variation of the zones within the pond proved its practical feasibility. The system worked for the entire experimental duration effectively without failure and validated the researcher's concept.

Introduction

Salt Gradient Solar Ponds (SGSP) is considered to be one of the most viable solar energy conversion and storage systems. They have been used for several applications including electricity generation [1]. The thermal performance parameters of Salt Gradient Solar Ponds are identified as 'rate of warm-up', 'highest achievable temperature', and 'cumulative heat collection'. The overall efficiency and functional economics of the pond are largely dependent upon these parameters [2]. The global potential of existing ponds to generate electricity has been estimated to be 160 GW [3]. Over a century after Kalescinsky first observed SGSP like heating phenomenon in Hungarian lakes in 1902, a great deal of analytical and experimental work has been done on various aspects of the solar pond [4–7]. SGSP is a body of saline water having large lateral dimensions and three vertical zones as shown in Fig. 1. Pond's operational life-span has two phases, namely the maturation phase; and the matured phase [8]. When a pond is constructed and a gradient zone is established, its liquid content is at the ambient temperature. After absorbing solar radiation, it warms up. Initially, for a few months, the STZ temperature rises steeply. The initial warming is termed as the maturation phase. Later also the STZ temperature oscillates within a certain range depending upon meteorological conditions. This later phase is termed as the matured phase. The NCZ thickness is the prime factor to decide the pond's warm-up time under given ambient conditions. Husain has developed an analytical approach for determining the optimum size of NCZ (X_m) for the maturation phase for rapid warm-up. The NCZ size also determines the heat collection rate in the matured phase.

The upper convective zone (UCZ) is designed to absorb turbulences due to agencies like wind, hail, raindrops, etc. Its size (thickness) is decided considering these external elements. The storage zone (STZ) is for storing heat. Its size is decided according to its functional requirements like heating storage capacity. The thickness of the non-convective zone (NCZ) governs the overall performance of the pond. It decides the warm-up time and heat collection efficiency after warm-up. NCZ acts as

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Development of Mathematical Model and its ANN Validation of Thermoelectric Generator System for its performance enhancement

P. M. Solanki¹, *

¹ Ph.D. Research Scholar, K.B.C.N.M.U, Jalgaon, Maharashtra, India
(p_msolanki@rediffmail.com)

* Corresponding Author

Dr. D. S. Deshmukh²,

² Associate Professor, G. H. Raisoni College of Engineering, Dighod hills, Nagpur, Maharashtra
(deshmukh.dhccraj@gmail.com)

Dr. V. R. Diware³,

³ Head of Department, Chemical Engineering, SSBT's COET, Jalgaon, and Maharashtra
(vrdiware65@rediffmail.com)

Dr. M. S. Deshmukh⁴

⁴ Associate Professor, AISSMS, College of Engineering, Pune, Maharashtra
(msdapp@gmail.com)

ABSTRACT

The experimental data based modeling achieved this all the way through mathematical models for the dependent Pi terms. In such complex fact relating non linear systems it is also intended to develop mathematical models using dimensionless analysis. The yield of this network can be evaluated by comparing mathematical model and experimental data. In the present work identify the independent and dependent variables from Thermoelectric Generator (TEG) system and developed the 3 dimensionless independent Pi terms against power of TEG module as dependent variable. This attempts the relevance of dimensionless analysis to find what parameters are influencing the performance of Thermoelectric Generator system (TEG).

Keywords: Mathematical Modeling, Dimensionless analysis, Thermo Electric Generator module, ANN.

1. INTRODUCTION TO TEG

The basic theory and operation of thermoelectric based systems have been developed for many years. Thermoelectric power generation is based on a phenomenon called Seebeck effect discovered by Thomas Seebeck in 1821 [5]. When a temperature difference is established between the hot and cold junctions of two Dissimilar materials (metals or semiconductors) a voltage is generated, i.e., Seebeck voltage. In fact, this phenomenon is applied to thermocouples that are extensively used for temperature measurement.

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Image Encryption Based on Matrix Factorization

Vivek Khalane^{1*}, Shekhar Suralkar², Umesh Bhiadade³

¹ Department of Instrumentation Engineering, Ramrao Adik Institute of Technology, Nerul, Navi Mumbai 00706, India

² Department of Electronics and Telecommunication Engineering, SSBT College of Engineering and Technology, Jalgaon 425001, Maharashtra, India

³ Research Guide, Electronics Engineering, Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon 425001, Maharashtra, India

Corresponding Author Email: vivek.khalane@rait.ac.in

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ABSTRACT

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data security, image encryption, matrix decomposition, independent component analysis, non-negative matrix decomposition

In this paper, we present a matrix decomposition-based approach for image cryptography. The proposed method consists of decomposing the image into different component and scrambling the components to form the image encryption technique. We use two different type of matrix decomposition techniques to check the efficiency of proposed encryption method. The decomposition techniques used are Independent component analysis (ICA) and Non-Negative Matrix factorization (NMF). The proposed technique has unique user defined parameters (key) such as decomposition method, number of decomposition components and order in which the components are arranged. The unique encryption technique is designed on the basis of these key parameters. The original image can be reconstructed at the decryption end only if the selected parameters are known to the user. The design examples for both decomposition approaches are presented for illustration purpose. We analyze the complexity and encryption time of cryptography system. Results prove that the proposed scheme is more secure as it has less correlation between the input image and the encrypted version of the same as compared to state-of-art methods. The computation time of the proposed approach is found to be comparable.

1. INTRODUCTION

Due to the necessity of computerized right management for network system and multimedia, we transmit large number of images over internet and wireless network. Therefore, the image encryption technology has received great attention and many techniques have been developed for the same. Recently, multimedia disturbances suffer with issue like data management and cloud storage through the internet. Therefore, image encryption technique with the capability of secured access are required. Many researchers have proposed various encryption methods [1-3]. Linear dimensionality reduction (LDR) technique is used for data analysis in various application such as compression, registration, feature extraction and noise filtering. LDR optimize the approximation effectively by curtailing singular value decomposition (SVD) into three matrices where two unitary matrices factorized diagonal matrix [4-6]. The lower rank in diagonal matrix can be obtained by adding singular value in approximate image. SVD is same as principal component analysis (PCA) by centering all data points at origin. The resulting principal components in PCA are still dependent therefore the source isolation is not possible. Independent Component analysis (ICA) is a source separation technique in which independent signals taken into consideration for higher order correlation. For signal registration, analysis, compression and encryption purposes, a two-dimensional (2D) image decomposed into matrix components using several techniques like vector quantization (VQ) [7, 8], singular value

decomposition (SVD) [9] and non-negative matrix factorization (NMF) [10-12]. The VQ method is help to reduce the computation complexity in image compression. In 1994, Pantero and topper invented the NMF algorithm and Lee and Seung further studied it. NMF can be expressed as nonnegative matrix, which is product of weighting vector and basis image. Both the collective matrix factorization (CMF) and homomorphic encryption (HE) design algorithm to facilitate the model without loss of any information by mapping the matrices for each unified feature vectors [13]. NMF model [14] is introduced three steps binarization framework for MS document images using three steps of features extraction, post processing methods and applying algorithm for selected coefficient parameter to extract the text. An efficient watermarking scheme has been proposed based on Hessenberg Matrix decomposition which transforming the cover image by discrete wavelet transform [15].

NMF techniques have been applied in various research area like micro array data analysis, molecule pattern analysis, collaborative filtering, bioinformatics, multimedia data. In some applications, the similarity index is found very high between original images and basis image. However, this is problem in image encryption because the attacker can quickly retrieve the original image from the basis image. To solve this problem, we have modified the encryption order of basis components. By doing image factorization using ICA/NMF, we decorrelate the input data and hence by doing that it improves data security (reduce correlation). This paper presents a new methodology for digital image encryption

SDN SCALABILITY FOR DIFFERENT NETWORK TOPOLOGY AND MULTIPLE RYU CONTROLLERS

Mr.N M Kazi, Dr. Umesh Bhadude

Electronics and Telecommunication Engineering

Shriam Sankhara Bamburji Trust's College of Engineering and Technology, Bambhori, Jalgaon Maharashtra

Abstract: In Software Defined Networks, the information base is split from control layer. This results in enhancing the programming capabilities, flexibility, availability and manageability of the network. This research paper concerns about scalability issues in SDN using RYU controller which includes different network topologies and basic centralized architectures of SDN. Different network topologies have been implemented and evaluated using mininet and python. The performance is evaluated using D-ITG and Iperf. During this research we study the effect of distributing control/intelligence over multiple controllers on scalability of network. In this paper we analyze two factors: a) the impact of SDN on its performance (in terms of throughput, delay, jitter and bitrate) under various workloads, and b) whether there is an inherent performance improvement with increase in number of controllers. Our results indicate that SDN performance increases with increasing number of controllers but number of controllers to increase will depend on the underlying topology. The datacenter topology degraded the performance with increase in number of controllers. But linear and tree topology can be improved by increasing the appropriate number of controllers.

Keywords: SDN, RYU Controller, scalability, mininet

1. INTRODUCTION

Software Defined Networks are now emerging in the field of networking. In SDN the control plane is used to control the behavior of the whole network. The network administrators can use the programs for the control plane written in high level languages including C, java, ruby, python etc. Due to increase in network users, today's network requirements are not fulfilled by traditional networks although traditional networks are fully developed.[1] There is a need to change the traditional networks due to following reasons.

1. Traffic patterns are changed
2. Network management is complex
3. Network operations are complex
4. Behavior of different network devices is controlled by intelligent systems
5. Big data means amount of data is increased

SDN is having much more benefits over traditional networks. It includes flexibility, adaptability, easy management, less cost and execution time. SDN network suffers from scalability issue. The centralized control plane does not support the increasing network demands. Different factors influencing SDN scalability are [2]

1. Limited processing powers of controllers
2. Limited processing powers of forwarding devices
3. Optimal placement of controllers
4. During packet transfer, latency and delay between controllers and network devices.
5. Link failure due to traffic

In this paper, we focus on scalability of SDN using RYU controller and Mininet. We have used Mininet as an emulator and RYU as an SDN controller. The scalability of the SDN network is tested for linear and tree topology as well as data center topology. The scalability and performance of linear and tree topology can be increased with increase in number of controllers. But the selection of optimal number of controllers is the major issue. The data center topology performs well with single controller only. The rest paper is organized as follows. Section 2 discusses RYU controller and the architecture of RYU controller. Section 3 focuses on experimental setup for scalability issues of data plane. Section 4 focuses on performance and finally section 5 has conclusion of paper with future work.

2. RYU SDN CONTROLLER

RYU is an open source SDN controller. RYU controller increase the agility of the network. It makes the network easy to manage. The new traffic is easily adopted and handled. The role of SDN controller is to communicate the information down to switches and routers with southbound APIs and up to the applications and business logic through northbound APIs. SDN controller is the brain of the SDN network.[3]

Performance Analysis of dq-PLL Based Controller for Synchronization of Grid Tied Inverter

Miss. Prajalita R. Narkhede¹, Dr. Paresh J. Shah²

ME Student of Electrical Power System SSBT, COET, Bambhori, Jalgaon

Professor & Head at SSBT, COET, Bambhori, Jalgaon

narkhedepraju30@gmail.com¹, shah.paresh@SSBTCOETjalgaon.ac.in²

Abstract

Nowadays, power created from the renewable energy sources (RES) tends to extend day by day to fulfill the increasing energy demand. Also, RES modify energy to be obtained a lot of economically and cleanly. Power supported the RES is most well-liked to transfer to electrical grid rather than storing. However, this energy isn't transferred to the grid directly as a result of usability and potency. Therefore, grid tied electrical converter that is transferred power to the grid is employed and electrical converter management mechanism is thus necessary. On the opposite hand, the electrical converter output voltages should be synchronic with grid voltages. To attain an acceptable grid synchronization, section fastened loops (PLL) are wide used. During this project a three-phase house vector pulse breadth modulation (SVPWM) controlled grid tied electrical converter is simulated in MATLAB/Simulink. All simulation and experimental results ensure that the output voltages of the grid tied voltage supply electrical converter are compatible with the grid and grid synchronization is with success achieved. Phase, frequency, and amplitude of section voltages are the foremost necessary and basic parameters got to be controlled or grid-connected applications. The aim of this project is to gift a review of assorted synchronization techniques for pulse breadth modulated voltage supply electrical converter.

Keywords: grid synchronization, inverter, PLL, renewable energy source, SVPWM

1. Introduction

1.1. Introduction

In the recent years, the studies on renewable energy sources (RES) have raised quick as a result of fossil primarily based energy sources have shrunken and these sources have seriously broken to the health of the all living creatures, and to the surroundings. Within the world, electricity production from the RES tends to rise daily so as to fulfill the increasing energy demand, and to modify energy to be obtained additional economically and cleanly [1].

Electrical energy made from the RES is most well-liked to transfer to electrical grid rather than storing in batteries. But, the made energy isn't transmitted to the grid directly owing to usability and potency. These conditions square measure sinusoidal-shaped undulation, continuity of current, fixed-frequency, being balanced of the made voltages, to be at intervals specific limits of current harmonics. During this regard, three-phase electrical converter is employed at high powers to transfer current to the grid.



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RESEARCH ARTICLE

A SINGLE-STAGE RECONFIGURABLE POWER CONVERSION PV-BATTERY SYSTEM

¹Mr. Rushikesh E. Pati and ²Dr. Shah, P. J.

¹PG Scholar, SSBT's College of Engineering and Technology, Jalgaon, Maharashtra, India
²Professor and HOD, SSBT's College of Engineering and Technology, Jalgaon, Maharashtra, India

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ABSTRACT

In this paper a new converter called reconfigurable Solar Converter (RSC) for PV-battery application. Particularly for utility scale PV-battery application is proposed. The basic concept of the converter is to use a single power conversion system to perform different operation modes for solar PV systems with energy storage. The suggested solution requires minimal complexity and modifications to the conventional three-phase solar PV converter for PV-battery system. The new converter is to use a single-stage 3 part grid-tie star PV converter to perform each dc/ac and dc/dc operations. This converter resolution is appealing for PV-battery application, as a result of it minimizes the quantity of conversion stages, thereby rising potency and reducing value, weight, and its volume.

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INTRODUCTION

Solar photovoltaic (PV) electricity generation isn't available and sometimes less available counting on the time of the day and therefore the weather. Solar PV electricity output is additionally sensitive to shading. When even a little portion of a cell, module, or array is shaded, while the rest is in sunlight, the output falls dramatically. Therefore, solar PV electricity output significantly varies. From an energy source standpoint, a stable energy source and an energy source which will be dispatched at the request are desired. As a result, energy storage like batteries and fuel cells for solar PV systems has drawn significant attention and therefore the demand of energy storage for solar PV systems has been dramatically increased, since, with energy storage, a solar PV system becomes a stable energy source and it are often dispatched at the request, which ends up in improving the performance and the value of solar PV systems (Rushikesh, 2017; Iman Mazhari et al., 2014; Hongrae Kim, 2013; Madhu Maraiiah, 2015). There are different options for integrating energy storage into a utility-scale solar PV system. Specifically, energy storage is often integrated into the either ac or dc side of the solar PV power conversion systems which can contains multiple conversion stages. Every integration solution has its advantages and disadvantages.

Different integration solutions can be compared with regard to the number of power stages, efficiency, storage system flexibility, control complexity, etc (Rushikesh, 2017; Iman Mazhari et al., 2014; Hongrae Kim, 2013). This novel single-stage solar converter called reconfigurable solar converter (RSC), the essential concept of the RSC is to use one power conversion system to perform different operation modes like PV to grid (dc to ac), PV to battery (dc to dc), battery to grid (dc to ac), and battery/PV to grid (dc to ac) for solar PV systems with energy storage [Sarath, 2017]. The RSC concept arose from the very fact that energy storage integration for utility-scale solar PV systems is sensible if there's an enough gap or a minimal overlap between the PV energy storage and release time. Fig.1 shows completely different eventualities for the PV generated power time of use: just in case (a), the PV energy is usually delivered to the grid and there's basically no need of energy storage. However, for cases (b) and (c), the PV energy should be first stored within the battery then the battery or both battery and PV supply the load. In cases (b) and (c), integration of the battery has the very best value and therefore the RSC provides significant benefit over other integration options when there's the time gap between generation and consumption of power (Rushikesh, 2017; Iman Mazhari et al., 2014; Hongrae Kim, 2013; Madhu Maraiiah, 2015; Sarath, 2017; Shaik Asha et al., 2015).

Reconfigurable Solar Converter (Rsc)

Introduction: A typical scheme structure of RSC is shown in Fig.2 which applies a single stage to three phase converters.

*Corresponding author: Mr. Rushikesh E. Pati,
PG Scholar, SSBT's College of Engineering and Technology,
Jalgaon, Maharashtra, India.

Inverter grid synchronization-A review and Simulation

Ms. Prajakta R. Narkhede*, Dr. P. J. Shah**

*Department of Electrical Engineering, North Maharashtra University, Jalgaon

** Department of Electrical Engineering, North Maharashtra University, Jalgaon

ABSTRACT

This paper represents the review, simulation and results of inverter grid synchronization. The converter i.e. three phase voltage source inverter is the most important part to use the renewable energy sources. The method use for inverter grid synchronization is the phase locked loop (PLL). In order to synchronize the inverter with grid in terms of voltage, frequency and phase the MATLAB SIMULINK is used. This paper also summarizes and compares different methods of synchronization in literature review section. Sinusoidal Pulse Width Modulation (SPWM) technology is also described in this paper. This method overcomes the low performance of conventional pulse width modulation technique which is use for active filter. Various simulation result are also presented to show the effectiveness of phase locked loop.

Keywords – Filter, Grid synchronization, Grid tied inverter, PLL, SPWM

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I. INTRODUCTION

With rapid growth of population on the earth, the growth of energy requirement is raising so high that, it made engineers bound to think alternative to fossils and other natural resources. Our present world is demanding the use of green energy. Photovoltaic (PV) energy has great potential to provide energy with minimum impact on the environment, since it's clean and pollution free [1]. The method of using the PV or solar energy for producing electricity has already become acceptable throughout the world. Grid tie Photovoltaic inverter is now the possible solution to the energy crisis of the world. Grid tie inverters or GTI are capable of feeding large power to the grid. Another fact is photovoltaic GTI has got to be compatible with existing grid. Major function is to convert DC energy of the photo voltaic cells to AC energy, which will allow the system to connect with the grid. This attempt will take the utilization of green energy to a level must for near future. These inverters are capable of producing energy from solar energy without any environmental pollution. Various methods have been presented for controlling the grid tied inverter. This methods can be designed as current source inverter (CSI) or voltage source inverter (VSI). There are two main advantages of current source inverter i.e. blocking reverse voltage and showing high impedance to short circuits. But still voltage source inverters are used more frequently in many applications. Because voltage source inverter has advantages such as easier control

and less conduction losses. The various methods used for inverter control are sinusoidal pulse width modulation (SPWM), space vector pulse width modulation (SVPWM) and hysteresis current control (HCC). In this paper the Sinusoidal Pulse Width Modulation (SPWM) technology has been described.

II. LITERATURE REVIEW

Muhammad Ramadan, R.T. Nuayagi, Woo Li Vee presents the modeling, simulation and hardware evaluation of a grid tied inverter suitable for wind energy conversion systems. The grid-tied wind generation converter converts the energy harvested from wind to DC through a static magnet synchronous generator employing a simple diode rectifier then converts it back to AC employing a pulse width modulated inverter before coupling the turbine technology to the facility grid. A closed loop simulation of the proposed set-up is modeled in PSIM environment. The hardware implementation of the proposed system is constructed using the Lab volt home energy production system and the experimental results are presented for various operating conditions. Experimental results on the grid measurements confirm that the system is able to supply the harvested energy from the wind to the grid for all wind speeds[3].

Sourmya Das, Pradip Kumar Sahu, Alek Kumar Shrivastav explains the modeling and synchronization of grid tied inverter. For a grid connected solar photovoltaic power generation system, synchronization in between generated voltage and grid voltage is the most important factor.



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Review of Nanofiber Production Techniques

P. H. Zope

Ph.D. Scholar, SSBT's College of Engineering and Technology, Bambhori, Jalgaon

Dr. S. R. Saralkar

Ph.D. Guide, SSBT's College of Engineering and Technology, Bambhori, Jalgaon

Abstract - In this paper different techniques are discussed and compared to obtain nanofibers such as CO₂ laser supersonic Drawing, Template Synthesis, Phase Separation, Self-Assembly, Melt-blown technology, Electrospinning, Polymerization, Centrifugal jet spinning, Plasma induced synthesis Electro hydrodynamic direct writing. The nanofibers have numerous applications such as solar cell, supercapacitor, sensors, biomedical devices, electrical and optical applications. This paper sheds light upon production techniques of nanofibers, their physical properties and production parameters affecting these properties. Electrospinning is the most popular and widely used method for producing nanofibers, the effect of its parameters on nanofiber properties were discussed.

Keywords: Nanofibers, electrospinning, centrifugal spinning, fabrication, meltblown technology, nanofiber properties.

1. Introduction

Nano materials are expected to exhibit significantly improved properties due to their small size almost close to their atomic and molecular sizes. Nanofibers are one dimensional nanomaterials with diameters ranging from 10-100 nm and aspect ratio >1000 and are characterized by high surface area to volume ratio. Due to very large surface area to volume ratio, distribution of nano to micro-sized porosity, lightweight, and flexibility in surface functionalities are some of the characteristics that make the nanofibers appropriate candidates for wide range applications such as solar cell, supercapacitor, sensors, biomedical devices, electrical and optical applications, wound dressing, drug delivery etc [1-5]. Now a day many researchers are working on production of nanofibers and many methods been invented like CO₂ laser supersonic Drawing, Template Synthesis, Phase Separation, Self-Assembly, Melt-blown technology, Electrospinning, Polymerization, Centrifugal jet spinning, Plasma induced synthesis Electro hydrodynamic direct writing etc. In this paper different nanofiber production techniques are discussed and compared.

2. What is Nanofibers ?

The definition of nanofiber, can be spitted into two parts, namely "nano" and "fiber". A "fiber" is defined from a geometrical standpoint as a slender, elongated, threadlike object or structure [5]. The term "nano" is technically referred to the scale of a billionth of the unit. Generally, nanofiber is a term used for fibers with a diameter between 50 and 300 nanometers [6].

3. Nanofiber Production Techniques

There are a number of techniques capable of fabricating nanofibers as shown in fig 1. These techniques include CO₂ laser supersonic Drawing, Template Synthesis, Phase Separation, Self-Assembly, Melt-blown technology, Electrospinning, Polymerization, Centrifugal jet spinning, Plasma induced synthesis Electro hydrodynamic direct writing.

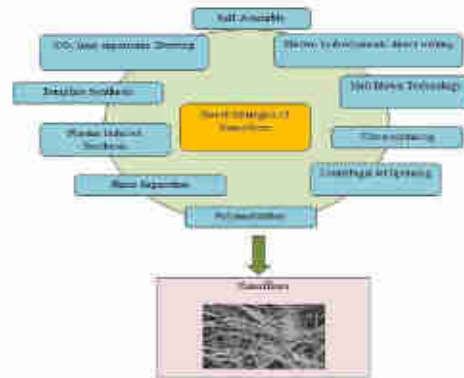


Fig 1: List of nanofiber production techniques

3.1. CO₂ laser supersonic drawing

A CO₂ laser supersonic drawing technique is used to produce long nanofibers based on a single continuous process in the absence of chemical solvents. Using a CO₂ laser, original fibers with diameters between 100 and 200 nm are melted and then passed through a supersonic air flow to achieve the supersonic drawing of nanofibers based on the force of the air. Generally, this strategy is applicable to a wide range of thermoplastic polymers, including polylactic acid (PLLA), polyethylene

Formulation of Mathematical Model for the Investigation of Frictional Power Loss for Multi cylinder S I Engine using Dimensional Analysis

P. N. Patil¹, Dr. D. S. Deshmukh², Dr. V. S. Patil³, Dr. S. P. Shekhar⁴

¹Research Scholar, Shri Gulabrao Deokar College of Engineering, Jalgaon, (M S) India

²Associate Professor, G H Raisoni College of Engineering, Hingna Road, Nagpur (M S)

India³Professor, University Institute of Chemical Technology, KBC North Maharashtra

University, Jalgaon⁴Professor & Vice Principal SSBT's College of Engineering

& Technology, Jalgaon, (M S) India

Abstract

The aim of this study is to develop the mathematical relationships for frictional power loss in spark ignition engine for gasoline and alternative fuels used such as liquefied petroleum gas using dimensional analysis. Since the major contributor for fuel consumption are automotive sector and in this the internal combustion engine plays a major role as a power sources. Frictional power loss which affect directly on performance of any engine, defining the ability of engine to utilize the energy supplied and power developed. The correlation developed between Torque Load (Ld), Speed (N), Frictional power (Pf), Engine oil viscosity (ν) as a major parameter. Dimensional analysis technique is applied for reduction of variables by using Buckingham π -theorem. A probable mathematical model has formulated from obtained π -term with multiple regression analysis. The ANN model has also developed and tested against observed data for gasoline fuel.

Keyword- Dimensional analysis, Buckingham π -theorem, Frictional power loss, ANN.

1.0 Introduction:

In the past 20 years the automotive industry have greatly influenced by fuel efficiency and this has been achieved by improvement in engine component design with a proper lubricants or engine oils. A decrease in automotive engine friction may gives the opportunity to increase engine output and decrease the fuel consumption. It is generally accepted that the friction losses associated with the Piston ring assembly, Engine bearings, and valve train and engine auxiliaries account nearly 80% Introduction of the total mechanical losses piston assemblies are recognized to be responsible for 50% or more of the frictional power consumption[4]. To find the frictional power, Some of the conventional methods are available to find the total or component engine friction such as IMEP Method from PV diagram, Morse Test Procedure, Motoring Breakdown Method, and Willians line test methods.

The use of LPG as an alternative fuel is commonly used in internal combustion engine in large quantities from a decade. Due to the high octane number, more energy content, less emission, less cost, better lubrication property, easier transportation and storage. Now a days the gaseous fuel as a LPG has been widely used throughout the world in S.I. Engine as a impact of green house emission losses than any other fossil fuels. A large number of studies are carried out on S.I. Engine fueled by LPG and gasoline and it is found at the use of LPG has a significant effect on engine performance and emission control.

In this present investigation, Spark Ignition engine fueled by LPG has been selected for study and to formulate the field data base mathematical model for friction Analysis. Dimensional analysis (DA) is very useful for computing dimensionless parameters. This dimensional analysis can be accomplished by using Buckingham for π -theorem in which a reduction of the number of independent parameters involved in a problem. These independent parameters get expressed as dimensionless groups and these dimensionless groups are always ratios of important physical quantities involved in the problem to be considered. In experimental data base model, its main function is to reduce the amount of independent variables and to simplify the solution. Therefore it can become an effective method, especially if a complete mathematical model of the investigated process is not known.

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Year Round Thermal Performance of Solar Parabolic Through Collector

¹Sanjay P. Shekhawat, ²Milind S. Patil

¹S. S. B. T's, College of Engineering and Technology, Bambhori, Jalgaon, INDIA

ABSTRACT: Solar Parabolic Trough Collectors has various solar thermal applications, such as production of electricity and high temperature applications. A receiver is mounted at focal of the concentrator and coated with the selective coating. Receiver heat loss and its optical performance is essential to understand when operating at different conditions. Such performance availability is helpful to develop experimental setup and analyze the same for various heat transfer enhancement techniques that are yet to be used and not reported. To understand the performance before such analysis, this study represents a one-dimensional numerical analysis of a PTC. In present work Engineering Equation Solver is used to develop the programme for analyzing thermal performance of a PTC. The developed model results were well agreed with the published data. Maximum optical efficiency is 77.19% and the maximum useful heat reaches to 1030 Watt in the month of May and 570 Watt in the month of December.

Keywords: Solar Energy, Optical Efficiency, Receiver, Thermal Efficiency.

1 Introduction

Parabolic trough collectors have a remarkable advantage of relatively high operating temperature and hence selected for process heat requirements [1]. In the year 2012 India has nearly 31 plants under construction [2]. India needs nearly 132×10^3 MW of peak demand and nearly 128×10^3 MW were met through various applications. In India Andhra Pradesh, Karnataka, Tamil Nadu generates nearly 13×10^3 MW of energy. Feasibility analysis was conducted for PTC power plants through Indian scientific committee [3]. India receives 5000 trillion kWh/year of solar energy and nearly 7.5 kWh/m²/day of solar irradiance is available. Thus the potential for the use of PTC's is high. It was a need to analyze the system with the use receiver inserts for heat transfer augmentation. Thus before developing the experimental model it would be better to perform mathematical modeling and the analysis. This helps to decide the dimensions of the PTC and the availability of the results to compare them with experimental outcomes. Hence the paper presented here has given an importance for the thermal performance analysis.

Experimental analysis was reported by the Edenburr [5] results obtained are compared with

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BARRIERS TO TQM IMPLEMENTATION IN MSME -SPECIAL REFERENCE TO JALGAON MIDC

M.V. Rawlani

Research scholar, Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon, MS, India.

Dr. A.M.Vaidya

Principal, Gangamal College of Engineering, Nagaon, Dhule, MS, India.

Dr.Mujahid Husain

*Professor and Head, Civil Engineering Dept., SSBT's College of Engineering & Technology, Jalgaon, MS, India.***ABSTRACT**

Most of the MSMEs have inadequate implementation of modern technology compared to large enterprises. Therefore, management technique i.e. TQM has been introduced to implement in MSMEs for establishing a good quality management system, developing human resources and increasing business performance. Despite the reasonable benefits of total quality management (TQM) joined by quality specialists and practitioners, these benefits are difficult to achieve in practice. Many MSME has found it difficult to implement TQM successfully. This research was conducted in MSMEs in JALGAON. The purpose of this paper is to understand TQM barriers and prioritize their relative importance by ranking them in the MSME. The questionnaire was used as a tool for collecting data in this research. This section indicates certain presumable difficulties acting as a barrier in implementing TQM principles. 8 presumable difficulties were mentioned in the questionnaire and response was to be given about the degree of agreement on a five-point scale. It was observed that 'resistance to change' was considered to be the most significant barrier in the way of TQM.

KEYWORDS: TQM, BARRIERS, MSME**INTRODUCTION**

Small scale sector provides approximately 40% of the state's GDP. It accounts to nearly 40% of our industrial output, nearly 6% of GDP, and 35 % of national exports while employing nearly 30 million people. The small scale sector in India covers several manufacturing over 8000 products, from conventional to high-end technical instruments. Owing to the feeling that the small scale sector was an important tool in employment generation, value creation and poverty alleviation (M.V.Rawlani et al. 2016). At present there is too much competition between industries regarding price, cost, and quality. There are various problems in industry such as lack of skilled workers, improper material inventory system, improper utilization of material, lack of training facilities, improper layout, deficiencies of safety equipment. TQM'S tools are the main tools that will be applied to this study. TQM is a management philosophy that seeks to unite all organizational functions (finance, design, engineering, and production, marketing, customer service, etc.) to focus on meeting customer needs and organizational goals. The purpose of this study is to review the difficulties experienced in the implementation of TQM leads in MSME in JALGAON. This study provides insight into the difficulties experienced in implementing TQM. Such knowledge offers opportunities to organizational decision-makers and human resources practitioners to plan proper intervention policies to offset these barriers to achieve a high success rate of TQM implementation. The results of such insights and compatible response strategies are likely to improve the success rates of TQM initiatives in JALGAON. The study also provides opportunities for academicians to search the dynamics of these barriers to further extend the knowledge in the area of TQM implementation in MSMEs in emerging economies.



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Machining of Aluminium Metal Matrix Composite: A Review

Ajay R. Bhardwaj^a, Dr. A.M. Vaidya^b, Dr. S.P. Shekhawat^c

^aResearch Scholar North Maharashtra University, Jalgaon Maharashtra, India

^bPrincipal Gangamai College of Engineering, Nagam, Dhule Maharashtra, India

^cHead Mechanical Engineering Department S.S.B.T's College of Engineering & Technology Bambhori, Jalgaon Maharashtra, India

Abstract

Machining of metal matrix composite materials is not such easy as compare to monolithic materials like steel, aluminium etc. the reason is highly abrasive nature of reinforcement present in composite which results in damage of work piece and wear development in cutting tool. Cutting tool plays a major role as far its machining is concerned, the objective of machining is to produce a product of desired shape and size with required surface quality and finish. Aluminium based metal matrix composites (AMMC's) finds wide industrial applications such as automobile, aerospace and sports related industries due to their excellent mechanical and physical properties. The cost of machining of a manufactured component amounts 20 % more the value of manufactured product and eighty percent manufactured parts need machining before they are ready to use. In this paper elaborated review has been done regarding problem encountered while machining these materials and especially conventional machining processes like turning and milling has been focused.

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Keywords: Composite; AMMC; Cutting Tools; Reinforcement; Turning; Milling

* Corresponding author. Tel.: +91-9011280416
E-mail address: ajaybhardwaj12345@gmail.com

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New emerging Techniques for the Biogas purification along with Sewage water Treatment using Algae

S. A. Thakur¹, V. P. Sangore¹, Miss. Payal Bhaurik²

¹Faculty, Chemical Engineering Department, SSBT's College of Engineering & Technology, Bambhori, Jalgaon

²PhD Scholar, Laxminarayan Institute of Technology Nagpur, RTM University of Nagpur.

Abstract:

Biogas for cuisine, power age and sanitation control has turned out to be actually practical. Because of its potential, the biogas needs cleansed for simple stockpiling into chambers and drag out the effectiveness of generators utilized for power creation. Worries over the earth and the increasing expenses for vitality and sewage water treatment have caused a resurgence of enthusiasm for anaerobic treatment and consequent utilization of the biogas delivered amid this treatment of natural squanders as fuel. In this research work, biogas get scrubbed by using sewage water and that sewage water get treated with algae in this way- three processes carried out simultaneously that are biogas purification, sewage treatment and algae production. In each process have their own applications and carried out at very low cost.

Keywords: Biogas Purification, Sewage Treatment, Algae Production

Introduction

As all know that, biogas is the best and cheapest source of energy; it can used in cooking in kitchen, for transportation such like, used in bus transportation, train transportation, electricity generation and many more. Biogas can produce by using organic waste matter, like cow dung, kitchen waste, agriculture waste in anaerobic reactor. Biogas mainly contains methane 65-70 %, carbon dioxide 30-35 % and trace amount of hydrogen sulfide. Carbon dioxide reduce the efficiency of biogas so, it required removing from it. Many processes are there for the purification of biogas as follows. [1]

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Preparation of Tartaric Acid from Tamarind Leaves

N.Y. Ghare

SSBT's College of Engineering & Technology, Bambhori, Jalgaon

nyghare@gmail.com

N.R. Divare

SSBT's College of Engineering & Technology, Bambhori, Jalgaon

svdware65@rediffmail.com

K.S.Wani

SSBT's College of Engineering & Technology, Bambhori, Jalgaon

wani.kishor@gmail.com

Abstract

Tamarind tree leaves are green colored economic raw material and with extraordinary properties such as long life. It comprises major concentrations of tartaric acid with pectin, potassium bitartrate in minor concentration. In this research percolation method is used for extraction of tartaric from tamarind leaves pulp. NMR spectra and UV spectrophotometer analysis was performed to analyze the composition of the obtained solid from the extraction process.

Key words: Tamarind leaves Pulp, percolation, tartaric acid, extraction.

Power Quality Problems at Distribution level Under Non linear Loads

Adnan Khan¹, S.M shembekar², Dr. P.J Shah³

¹(UG Student Electrical Engineering Dept. SSBT's COET bambhori, Jalgaon, (a.khan@ssbt.ac.in))

²Asstt. Professor Electrical Engineering Dept. SSBT's COET bambhori, Jalgaon (smshembekar@ssbt.ac.in)

³(Professor Electrical Engineering Dept. SSBT's COET bambhori, Jalgaon (p.j.shah@ssbt.ac.in))

Abstract — Power quality is focus and area of interest for power engineers nowadays. With the excessive use of advanced and upgraded power electronic equipment, standard system parameters have badly affected. Voltage, current, frequency of system is being subjected to severe changes due to these advancements. Hence to maintain stability of power system new strategies must come into account to cope these issues. Voltage sags and voltage swells have mainly discussed in this paper. And Conventional plus new methods such as Shunt Active Power Filter (SAPF) is proposed as solution and remedy at distribution level.

Keywords: Voltage Dips, Swells, UPS, Power Quality, VSC, SAPF

INTRODUCTION

Power quality is being a popular, much talked about and considered topic in the performance of many industrial applications such as power system operation, manufacturing units, nuclear and research fields and information technology. Since electrical power occupies the top position in energy hierarchy, power engineers are constantly working in this field. Users require pure sine wave shape, constant frequency and symmetrical and constant voltage with a constant root mean square (RMS) value [1]. To fulfill these demands, the power quality problems must be eliminated from the system. The typical power quality disturbances are voltage sags, voltage swells, interruptions, phase shifts, harmonics and transients. Among the disturbances voltage sag is considered the most severe since the sensitive loads are very vulnerable to momentary changes in the voltage. Voltage sag is a short-duration reduction in voltage magnitude. The voltage temporarily drops to a lower value and comes back again after approximately 150 microseconds[2]. Despite their short duration, such voltage dips can cause adverse problems for a wide range of equipment. The characteristic of voltage sags is related with:

1. The magnitude of remaining voltage during sag.
2. Sag duration.

In practice the magnitude of the remaining voltage has more influence on system than the duration of

sags. Voltage sags are generally within 10% of the nominal voltage in utility. Voltage sags can cost millions of rupees in damaged product, lost production, restarting expenses and danger of breakdown [3][4].

Short circuit faults, heavy motor switching and transformer energizing will cause short duration increase in current and inter cause voltage sags on the line. For certain and users of sensitive equipment the voltage correction device and voltage stabilizers may be the only cost-effective option available.

There are number of ways to limit the losses and costs caused by voltage dips and one interesting approach considered here is to use voltage source converter connected in shunt across the supply system and the sensitive load, this type of devices are often termed a Shunt Active Power Filter (SAPF).

With the increasing structure of power system in India, the system is becoming great and complex as a result demand for efficiency, stability and reliability is must. Hence new devices and technology must be introduced to meet all these expectations. In this paper an attempt is made to highlight some of the power quality problems their causes and their consequences, an performance of system and hardware. New power electronic device i.e SAPF shunt active power filter is proposed on which we are working to tackle these problems specially voltage sags and swell we are consider [5].

II. PROBLEMS ASSOCIATED WITH POWER QUALITY

a) Transients

When a transmission line is energized by voltage source, the whole of the line is not instantly energized, there is some time difference between initial condition and final steady state condition. This is due to distributed parameters of system such as resistance, inductance and capacitance etc. This is similar to a voltage wave travel along the length of line. This traveling voltage wave is also called surge.

ANN based On-Line Monitoring System Of Incipient Fault Detection in Power Transformer

Ami A. Barhate
 abbarhate@gmail.com
 Godavari college of Engineering,
 Jalgaon, INDIA

Dr. P. J. Shah
 pjshah1j@yahoo.com
 SSBT's College of Engineering,
 Jalgaon, INDIA

Abstract- Technology of on-line monitoring of dissolved gas in transformer oil is the focus of attention nowadays. As the technologies of computer, macromolecule materials and optical spectrum analysis develop rapidly, the on-line monitoring devices are more and more perfect and are used more popular in electric power production. In this paper, the on-line monitoring device of dissolved gas in transformer oil typed HYDRAN is set as an example and the working principle and the properties of this kind of systems are introduced. Some common problems in using on-line monitoring devices are brought up and the settlement methods are described. This paper gives consultation to the maintaining of the on-line monitoring devices.

Artificial Neural Network (ANN) technique to recognize the incipient faults of power transformers. The technique presented in this discussion conventional dissolved gas analysis (DGA) accuracy of diagnosis improves. The ANN is trained by using Adaptive Back propagation learning algorithm that converges much faster than the conventional Back propagation algorithm. The developed ANN system for the power transformer fault diagnosis has superior performance in fault diagnosis as compared to the conventional methods.

Keywords: Dissolve gases, Incipient fault, Hydran, Artificial Neural Network

1 INTRODUCTION

In common condition, the transformer oil and insulation will age and break up under the effect of the heat and electricity, some small molecule hydrocarbon is produced. And gases as carbon dioxide, carbon monoxide are released. Most of the gases dissolved in oil and increase as time pass. If there is some fault in the transformer, the gases

dissolved in oil increase much faster than normal speed. As a result, by analyze the dissolved gases, the latency fault can be diagnosed in time. The DGA (Dissolved Gas Analysis) can be taken online. And the result is repeatable. So the DGA is considered as one of the best method in diagnosing latency fault.

Generally speaking, the traditional monitoring method is to take out oil-samples or iron-core from transformers. As a result, it leads to the cost high, the reliability of power supply poor. The worst of all, the method can't forecast the life of transformers in time. [1, 2].

II PRINCIPLE OF THE SYSTEM

Latent hazards in power transformer, if not detected in time, will lead to serious accidents. To strengthen transformer oil dissolved gas monitoring and early detection that exists within the transformer latent potential safety problems.

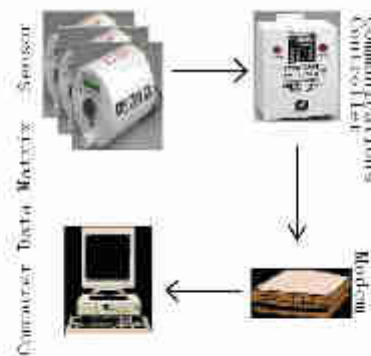


Fig.1 Architecture of HYDRAN System.

COMPARATIVE ANALYSIS OF MULTILEVEL INVERTER IN POWER APPLICATION: A REVIEW

Darshana D. Khetkar

PG Scholar, Electrical Engineering Department SSBT's College of Engineering & Technology, Jalgaon.

Dr. P. V. Thakre

Professor, Electrical Engineering Department SSBT's College of Engineering & Technology, Jalgaon.

Abstract — This paper deals with various Multilevel Inverter topologies used in Renewable Energy Sources. Also, it deals with three phase Cascaded Multilevel Inverter and its control techniques and also modulation techniques for modular cascaded multilevel inverter. The Review paper is made in the aspects of Construction Complexity, Installation area, Total Harmonic Distortion, Controlling methodologies and Components required. The Multilevel Inverter (MLI) performance, reliability, efficiency not decided by the types and levels of MLI and but by the usable Pulse Width Modulation (PWM) techniques. Depends upon the usage of PWM techniques the THD value will also get varied and hence it is noted. This review paper will be more useful for selecting a suitable MLI and PWM Techniques for any Renewable Energy Sources. This paper is review of MLI in particular to the form and function of modular multilevel inverters (MMI), with their different topologies, modulation, modeling and control schemes. Detailed analysis of MMI with their functions and types has been made in comprehensive manner with existing literature available till now. All existing methods are compared in all manner in detail considering all parameters for applications of the best methods available.

Keywords — Multilevel Inverter, Hybrid Inverter, Cascaded Multilevel Inverter, PWM Techniques, Total Harmonic Distortion, Renewable Energy Sources.

I. INTRODUCTION

Recently, the multilevel inverters have gained much attention due to their major effective and flexible features such as high power quality output waveform with low harmonic components, enhanced electromagnetic compatibility, less circuit complexity, lower dv/dt ratio and reduction in switching losses. Although the two level inverter method of converting AC is effective but it has some drawbacks as it creates harmonic distortions in the output voltage waveform and also has a high dv/dt ratio as compared to that of a multilevel inverter. The MLI is a kind of updated version of two-level inverter. MLI creates a smoother stepped output waveform, it has lower dv/dt and also low harmonic distortions. When voltage level increases, the harmonic distortions will reduce accordingly, but the problems of complexity in implementation, controller circuit and electronic components, cost also increases along with the increased voltage levels. Also, in this paper, detailed study is made on Cascaded type of multilevel inverter and comparison is made for better application. In that, main focus is given to various techniques used for three phase cascaded multilevel inverter.

Researchers started to focus on Multilevel inverters especially in medium and high power applications due to its characteristics of providing staircase output voltage waveform with power semiconducting devices. MLI have an advantage of enabling the inter-connection of renewable energy sources to improve the energy utilization of the system. In order to improve the quality of the output voltage, the number of components required to implement three-phase CMLI should be significantly increased which increases the implementation cost, inverter physical size and complicates the control system. Although several topologies have been proposed in order to reduce the device count and increase the number of levels of single phase CMLIs, the majority of these topologies have not been extended to three-phase structure yet.

Study of Multilevel Inverters and their Control Strategies: A ReviewBhausaheb Sonawane^{1*}, Dr.P.V.Thakre²¹Asst.Prof. SGDCOE Jalgaon (MS)²Prof. SSBT COET Bambhori Jalgaon (MS)^{1*}bhausaheb.sonawane25@gmail.com²pvthakre2009@rediffmail.com**Abstract**

In this review paper our aim is to widen the knowledge about the performance of different cascaded H-Bridge multilevel inverter fed induction motor drives through harmonic analysis. Large electric drives and utility applications require advanced power electronics converter to meet the high power demands. Multilevel power converter structure has been considered as an alternative in high power and medium voltage ranges. Multilevel converter not only achieves high power ratings but also improves the performance of total system in terms of harmonics.

Keywords: Multilevel Inverter, THD, Harmonics.

1. INTRODUCTION:

Multilevel inverter is a power electronic load circuit which is capable of providing desired alternating voltage level using multiple lower level DC voltages as an input. Mostly a two-level inverter is used in order to generate the AC voltage from DC voltage. Multilevel inverters are becoming more popular because of their high voltage operation capability, low switching losses, high efficiency and low Electro Magnetic Interference (EMI). The term multilevel starts with the three-level inverter introduced by Nabae et al (1981). Nowadays, multilevel inverters are gaining much more in interest in power applications, due to their ability to meet the increasing demand of power rating and power quality associated with reduced harmonic distortion and lower electromagnetic interference. A multilevel inverter has several advantages over a conventional two-level inverter that uses high switching frequency pulse width modulation (PWM). As shown in figure 1, Figure 2 shows output of a multilevel inverter where by achieving number of voltage level, the output could be made close to sinusoidal.

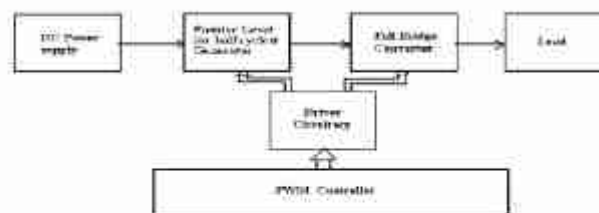


Figure 1. Basic Block Diagram



A Novel Weighted SVM Classifier Based on SCA for Handwritten Marathi Character Recognition

Surendra P. Ramteke¹, Ajay A. Gujar² and Dhiraj S. Deshmukh³

¹Department of Electronics & Telecommunication Engineering, Shriam Sadhana Bombay Trust College of Engineering and Technology, Bambhori, Maharashtra, India; ²Sipra College of Engineering & Technology, Amravati, Maharashtra, India; ³Mechanical Engineering, Dr. Babasaheb Ambedkar College of Engineering & Research, Nagpur, Maharashtra, India

ABSTRACT

The research on handwritten optical character recognition (OCR) of Marathi script is very challenging due to the complex structural properties of the script that are not observed in most other scripts. This paper gives an OCR framework for handwritten Marathi document classification and recognition system. Due to the large variety of symbols the Marathi characters recognition poses great challenge and their proximity in appearance. The weighted one-against-rest support vector machines (WOAR-SVM) assume a noteworthy part to deal with vast feature measures which are utilized for the classification. Here, a new sine cosine algorithm is proposed for the identification of handwritten Marathi text. By utilizing different morphological operations the preprocessing is finished and the Marathi text is flexibly segmented in three levels; line segmentation, word segmentation and character segmentation with Modified Pitu method. Various features like statistical, global transformation, geometrical and topological features are extracted from the preprocessed image by extraction techniques. Result obtained show that various features with WOAR-SVM classifier perform the best by yielding high accuracy as 95.34%.

KEYWORDS

Optical character recognition; WOAR-SVM; sine cosine algorithm; Modified Pitu method; Global transformation

1. INTRODUCTION

In digital computer machine the serious research topic is simulation of human perusing. Not only the main advantages of such exertion were difficult for simulating human reading but also the probability of efficient application in which printed and handwritten character present on document has to be transferred into machine justifiable format [1]. The automatic character recognition of printed and handwritten written record information has an assortment of practical and commercial applications in libraries, banks and post offices [2,3]. In the field of image processing, pattern recognition, machine learning and artificial intelligence the optical character recognition (OCR) is an examination. OCR is a procedure of converting scanned images of machine printed or handwritten text into a computer processable format [4]. All the OCR particularly of records in English language has been comprehensively studied and actualized effectively over years [5].

The OCR comprises two classifications based on data acquisition process: off-line character recognition and online character recognition [6-8]. The off-line character recognition is additionally separated into two sections: machine printed and handwritten character recognition.

There are heaps of issues in handwritten character recognition when contrasted with documents of machine printed. Since various peoples have distinctive styles in composing, pen-tip estimate and in their writing some peoples have skewness. To overcome this issue every one of the difficulties makes the researchers to work. In India Devanagari script is an older most one, which is utilized to write numerous languages like Nepali, Hindi, Marathi, Sindhi and Sanskrit for documentation [9]. Be that as it may, the generally preferred language in Marathi; a very less measure of work has been finished.

In these areas most of the present work is restricted to English and a few oriental languages. For Indic scripts the absence of efficient solutions in Marathi language has hampered extraction of information from a historical importance and social archives. For text character segmentation different techniques have elaborated; they are wavelet transforms [10,11], curvelet transform [12,13], and Gradient feature [14,15]. Consequently, for the OCR these techniques are not demonstrated dependable [16,17].

In this paper, we exhibit a modified approach for handwritten Marathi text document classification and

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BEHAVIOUR OF MOTORCYCLE USERS TOWARDS VEHICULAR AIR POLLUTION: A STUDY WITH REFERENCE TO JALGAON CITY

Mukesh Ahirrao¹ and Dr. Vishal S. Rana²

Assistant Professor¹ and Associate Professor², S. S. B. T's College of Engineering & Technology, Jalgaon

ABSTRACT

Air pollution is most important issue in the 21st century among all others. There is no need to reiterate it's important. Ample references are available in literature review on air pollution, its causes, impact and different types of air pollutants. It is also important to study behavior of motorcycle users towards air pollution that is basically being caused by vehicles used by them. As irregular and improper maintenance of vehicles are contributing to more air pollution.

This study is based on both primary and secondary data. Secondary data is used to conceptualize it and primary data is collected to analyze the behavior of motorcycles users in Jalgaon city towards cause of air pollution. Study reveals that awareness and attitude of motorcycle users in Jalgaon city towards air pollution is positive but it lacks actions from their side to minimize the pollution. Study covers various policy measures to control the same with emphasis on common directed efforts of human society.

Keywords: Air Pollution, Vehicle Air Pollution, Motorcycle Air Pollution Etc.

I. INTRODUCTION: AIR POLLUTION

Air pollution is most important issue in the 21st century among all others. There is no need to reiterate it's important. Ample references are available in literature review on air pollution, its causes, impact and different types of air pollutants.

Air pollution is described as contamination of the atmosphere by various substances that cause danger to health and welfare of plants, animals, material resources & property on earth. It reduces the capacity of earth to reproduce and contaminates biodiversity. Almost all economic activities of human society are source of air pollution directly or indirectly but major of them are transportation sources, stationary sources, industrial processes, solid waste disposal, forest fires, and coal mining many more. The major pollutants released by all these sources contain carbon monoxide (CO), lead (Pb), nitrogen oxides (NOx), ozone (O₃), particulate matter, sulfur dioxide (SO₂). These substances last long time in environment^[4].

II. NEED OF RESEARCH

Transportation is the major contributor of air pollution. More than half of the carbon monoxide and nitrogen oxides, and almost a quarter of the hydrocarbons emitted into our air by transportation sector in 2013^[5].

According to Road Transport Year Book (2011-12), the population of motorcycle in developing country against developed countries is four times greater. As well as population of motorcycles in India is 72 % of total vehicle population^[7]. This signifies that contribution of motorcycles in developing country specifically in India is significant in nature. It also indicates the seriousness of air pollution in developing countries because minimizing air pollution in developing country means reducing the living standards of developing country.

Air pollution has multiple corners. It is not only a scientific process but also has some behavioral as well as social corner. Air is polluted through the industrial and mechanical process of human societies. Human behavior as well is a most important contributor in air pollution. Though pollutants are released by industrial and mechanical process, its proportion can be controlled through human care. Proper maintenance of machines and plants can be subjected to control the emission of many pollutants in the atmosphere^[1].

Therefore, it is important to study pattern of behavior of motorcycle users towards air pollution that is basically being caused by vehicles used by them. As irregular and improper maintenance of motorcycles and vehicles are also important contributing factor of air pollution.

III. OBJECTIVES OF THE STUDY

- To study behavioral aspects of motorcycle users towards air pollution in Jalgaon City.

IV. HYPOTHESIS OF THE STUDY

- 70 % motorcycle users take precautions to control air pollution through their motorcycles.



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Micro Perspective of Gold Demand: A Study of Underlying Factors

Mukesh Ahirrao
Dr. Saroj Patil
Dr. Vishal Rana

Associate Prof., SSBT's College of Engineering &
Technology, Jalgaon, MS, India,

¹mukeshahirrao1984@rediffmail.com, sarojpatil74@rediffmail.com,
vishal.rana1980@yahoo.com,

Abstract:

This paper explores the underlying factors behind high gold demand in India. It involves Univariate analysis to study the drivers of gold demand as well as correlation analysis examined the correlation between purchase of gold for investment purpose and purchase of gold for consumption purpose. Prestige of ownership, fashion, rituals of Diwaly & Akshaytritiya as well as wedding ceremony are important factors that drive high gold demand in India and these factors are again significantly correlated with investment in gold.

Keywords: Gold Demand, Gold Investment, Gold Consumption, Gold Import.

Introduction:

India is one of the largest importers of gold in the world with 26 % of total physical demand worldwide. Gold is the second major import item of India after petroleum, oil, and lubricants and constitutes 11.3 % of its imports in 2011-12 in value terms. The rise in imports of gold is one of the factors contributing to India's high trade deficit and current account deficit in 2011-12, forming 30 per cent of its trade deficit^[1]. India is the 2nd largest gold jewellery consumer in the world imported average 709 tons of gold during five years 2011-12 – 2015-16. According to Ministry of Commerce, India's gold imports stood at \$23 billion in 2016 and industry estimated \$22.2 billion till June 2017^[2]. Gold imports are a major contributor of India's current account deficit after petroleum products and a major issue in Indian economy since 1947. In order to curb the gold import, it is very necessary to ascertain the underlying microeconomic factors behind rising gold demand in India.

Review of Literature:

According to the report of World Gold Council (2017), rising income of Indian middle class as well as rising price of gold is the main factor behind rising gold demand. Report also states that gold is deeply embedded into Indian culture. There are many occasion like Diwaly, Akshaytritiya and gift to new born baby etc when Indians buy gold in the form of jewellery and coins as well as gold bars are purchased for the purpose of investment. Both Investment and consumption are the significant part of the gold demand in India^[3]. Neha Elizabeth Emmanuel (2014) has highlights cultural aspects, prestige, decorative reasons, investment, wedding ceremony and gifts are the motives behind purchase of gold in India^[4]. A per the report of FICCI - World Gold Council gold is purchased by Indian people for many reasons such as investment, beautification, festivals, for dependent's or own marriage, gifts, and collaterals, for jewellery in future^[5]. Kannan & Dhal (2008) has studied real income, relative gold price and a set of variables such as interest rate, equity price, exchange rate, personal income tax, and government spending as drivers of rising gold demand in India^[6]. Similar findings can be



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Materials Today: Proceedings

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Optimization Of Roller Burnishing Process Parameters On Surface Roughness Using Response Surface Methodology

Prashant N. Uthhe ^a, R. S. U.D. Patil ^b, C.R. Patil ^cShow more  Outline |  Share  Cite<https://doi.org/10.1016/j.matpr.2019.07.295>[Get rights and content](#)

Abstract

The present study is to optimize the roller burnishing process parameters for improved surface quality. A Response Surface Methodology based on Central Composite Design is utilized for experiments. Four process parameters considered include feed, speed, number of passes and depth of penetration. The experiment was performed with work piece of EN19 alloy steel using new roller burnishing tool on a CNC lathe machine. A regression model has been developed to find out the optimum value of surface roughness. Using Response surface methodology concept to optimized the values of the burnishing process should be determined- feed 0.06 mm/rev, depth of penetration 0.17mm and burnishing speed 1196 rpm at single pass.

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Keywords

Single roller burnishing; Surface roughness; CNC lathe; Anova Analysis; RSM

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A Comprehensive Review on Privacy Preservation Techniques and Approaches for Data Sanitization

Nitin Prudhik Jagtap¹, Prof. Dr. Krishankant P. Adhiya²

¹Research Scholar

²Professor

Computer Engineering Department
SSBT's COET, Bambhori, Jalgaon

¹ntnjagtap@gmail.com, ²kpadhiya@yahoo.com

Abstract

Association rule mining technique is usually used in data mining to find relationship between item sets. It is also effective for finding the frequent pattern in dataset. Many organizations used it for basket analysis, cross marketing and catalog design. For this reason many organizations disclose their information or dataset for mutual benefit and improve their business schemes. But this database may be containing some private data and which the organization does not want to disclose. So privacy issue plays vital role when several organizations contribute to their data for mutual benefit but no one wants to disclose their private data. Therefore, before disclosing the data, sensitive patterns or rule must be secret and to solve this issue PDDM techniques are helpful to enhance the security of database. This paper discusses the current approaches and techniques. Also, metrics for evaluating the performance association rule hiding approaches. Lastly, future trends in this research area are particular.

Keywords: PDDM, Privacy Preserving, Data Sanitization.

1. Introduction

Now days, the privacy preserving data mining has become an essential concern due to the rapid growth of data in corporate word. Such data may contain sensitive data and can lead to seclusion or security threats if they are altered. As the data mining technology has grow fastly, getting user's sensitive information by using data mining technology has become very easy task. This led to increasing concerns about the privacy of the original data.

Association rule hiding is a subarea of privacy preserving data mining that studies the side effects of association rule mining that generated from the reveal the insightful information belongs to persons or organizations. The existing of many comprehensive set of application scenarios in which collected data or information patterns extracted from the data have to be shared with others entities to serve owner or organization particular purposes. The sharing of data or knowledge might do at a cost to privacy, primarily due to two main reasons: (a) if the data refer to persons, then its revelation can disobey the privacy of the individuals who are recorded in the data. If their identity is exposed to not

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Fuzzy Logic Controller Based Shunt Connected Three Phase Active Power Filter

Abhilasha N. Salunkhe¹, Dr. Paresh J. Shah²

¹PG Scholar, ²Professor

Electrical Engineering Department SSBT's College of Engineering & Technology, Jalgaon

¹abhilashunkhe4807@gmail.com, ²psjshah@yahoo.com

Abstract: In recent years the large scale use of the power electronic equipment has led to an increase of harmonics in the power system. The harmonics results into a poor power quality and have great adverse economic impact on the utilities and customer so to mitigate current harmonic we were used shunt active power filter (SHAF). Proportional integral (PI) and Fuzzy logic controllers (FLC) technique is utilize to control the performance of SHAF. The projected PI with SHAF and fuzzy with SHAF monitoring structure is established to recover the power quality which simulated with MATLAB/ SIMULINK.

Keywords: Harmonics, Shunt Active Filter, DC link voltage, PI controller and FLC.

1. INTRODUCTION

The large scale use of the non-linear loads such as adjustable speed drives, traction drives, etc. [1] and power converters has contributed for the deterioration of the power quality and this has resulted in to a great economic loss. Thus it is important to develop the equipment that can mitigate the problem of poor power quality.

Power Quality (PQ) [2], is defined as "Any power problem established in voltage, current or frequency deviation which leads to damage, malfunctioning, disoperation of the consumer equipment". Poor power quality causes many damages to the system, and has a contrary economical impact on the utilities and customers. Highly automatic electric equipment, in particular, causes enormous economic loss every year. The problems of harmonics can be reduced or mitigated by the use of power filters. The Active power filters have been proven very effective in the reduction of the system harmonics. One of the most severe and common power quality problems is current harmonics. Particdatly, voltage harmonics [1] and power distribution equipment problems result from current harmonics.

The voltage generated at the generating station is not purely Sinusoidal. Due to the non-uniformity of the magnetic field and the winding distribution in a working AC machine, voltage waveform distortions are created, and thus the voltage obtained is not purely sinusoidal. The distortion at the point of generation is very small (about 1% to 2%), but still it exists. Due to this deviation from the pure sine wave, voltage harmonics occurs.

Each time a pure AC voltage is realistic to load, after that load current drawn by the load is proportional to the voltage and impedance and monitors the covering of the voltage waveform. These loads are referred to as linear loads (loads where the voltage and current follow one another without any distortion to their pure sine waves) [3].

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PI CONTROLLER BASED SHUNT CONNECTED THREE PHASE ACTIVE POWER FILTER

Abhilasha N. Salunkhe¹, Dr. Paresh J. Shah²

¹PG Scholar, Department of Electrical Engineering, SSBT's College of Engineering & Technology, Jalgaon.
²Professor, Department of Electrical Engineering, SSBT's College of Engineering & Technology, Jalgaon.

Abstract – In recent years the large scale use of the power electronic equipment has led to an increase of harmonics in the power system. The harmonics results into a poor power quality and have great adverse economic impact on the utilities and customer so to mitigate current harmonic we were used shunt active power filter (SHAF). Proportional integral (PI) technique is utilize to control the performance of SHAF. The projected PI with SHAF monitoring structure under steady working circumstances is established to recover the power quality is simulated with MATLAB/SIMULINK.

Key Words: Harmonics, Shunt Active Filter, DC link voltage, PI controller.

1. INTRODUCTION

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Each time a pure AC voltage is realistic to load, after that load current drawn by the load is proportional to the voltage and impedance and monitors the covering of the voltage

waveform. These loads are referred to as linear loads (loads where the voltage and current follow one another without any distortion to their pure sine waves) [4]. Some loads cause the current to vary disproportionately with the voltage during each half cycle. These loads are defined as non-linear loads. The current harmonics and the voltage harmonics are generated because of these non-linear loads so due to non linear load effects many problem's like electro-magnetic interference (EMI), power system voltage fluctuations low power factor, low energy efficiency, and so on. Hence, it is necessary to compensate this effects [5].

2. ORGANIZATION OF CONTROL CONVERTERS

The accuracy in the estimation of the ac grid voltage parameters has a strong influence in the overall performance of grid-connected power converters. A precise synchronization algorithm is needed to estimate the grid voltage parameters, i.e., voltage amplitude, frequency, and phase angle, as these values are needed for conducting an accurate control of the active and the reactive power delivered to the grid. In addition, a precise monitoring of the grid conditions is mandatory in order to determine the most suitable operation mode of the converters, as well as for supporting properly the connection and disconnection maneuvers. Due to the significance of the control of microgrids under generic grid conditions, the synchronization system should be able to confirm a proper behavior under unbalanced and distorted voltage conditions. The synchronization system should be able to work on both grid-connected and island modes by using power converters. Change between these two process the synchronization unit should provide precise synchronization signals which allow the grid-forming power converter for establish a stable voltage. In the island mode, the synchronization system works as an oscillator at a fixed frequency ω^* . In transient operation, the voltage generated by the grid-forming power converter should be resynchronized with the restored grid voltage. The synchronization system slowly varies the phase angle and frequency of the island's voltage to resynchronize with the grid voltage. All the grid-feeding power converters linked to such microgrid would be exposed to the re-joining frequency and phase angle transients, so that this maneuver has to be prepared in a stable and secure way.

2.1. Synchronous Reference Frame Phase-Locked Loop

The phase-locked loop technology has extensively been used to synchronize grid-connected power converters with the grid voltage. In three-phase systems, the synchronous



A Streamlined OCR System for Handwritten Marathi Text Document Classification and Recognition Using SVM-ACS Algorithm

Surenbra Pandurang Ramteke^{1*} Ajay Anil Gurjar² Dhiraj Sheshrao Deshmukh³

¹*Department of Electronics & Telecommunication Engineering,
Shram Sadhana Bombay Trust College of Engineering and Technology, Bambhori, Maharashtra, India*

²*Signa College of Engineering & Technology, Maharashtra, India*

³*Department of Mechanical Engineering,
Dr. Babasaheb Ambedkar College of Engineering & Research, Maharashtra, India*

* Corresponding author's Email: tsurenbra0711@gmail.com

Abstract: Handwritten optical character recognition (OCR) is a noteworthy research region because of its sensitivity in segmenting the character which increments on account of MARATHI script because of modifiers and compound characters. This paper gives a streamlined OCR framework for handwritten MARATHI text document classification and recognition system. To deal with a vast measure of features, the support vector machine (SVM) assumes a noteworthy part which was likewise used for the classification reason. In this paper, we display a projection profile segmentation technique which generates less error. The Curvelet Transform (CT) to be exceptionally efficient and heavy to get the feature characters from the pre-processed image. The extracted feature sets are decreased by Principle Component Analysis (PCA) algorithm. After the feature extraction process, the Adaptive Cuckoo Search (ACS) algorithm is used for the optimization procedure. Here, the written by hand MARATHI script was segmented flexibly in three levels; (1) line segmentation, (2) word segmentation and (3) character segmentation. The preprocessing was finished utilizing different morphological operations. The experimental results show that, the performance of the proposed technique is assessed in view of the accuracy, sensitivity, precision, recall and F-score. Compared with the existing Fire Fly Selection (FFS) and Bat Selection (BS) approach, the proposed method has 99.56% accuracy, 90% sensitivity, 91% precision, 89.51% recall, 99.67% specificity and 89.93% F-score. The proposed approach is actualized using MATLAB and the realtime Marathi character datasets are used for our examination.

Keywords: Optical character recognition (OCR), Curvelet transform (CT), Principle component analysis (PCA) algorithm, Adaptive cuckoo search (ACS) algorithm, SVM for classification and recognition.

1. Introduction

All Optical Character Recognition (OCR) especially of English language documents has been extensively studied and implemented successfully over a number of years [1]. Devanagari script is used for the majority of Indian languages, like Hindi, Marathi, Sindhi, and Sanskrit etc. Some of the Indian scripts like Gujarati, Punjabi, and Kannada etc. to have been derived from the Devanagari script [2, 3]. Handwritten characters have an infinite variety of styles from one person to another person.

Due to this wide range of variability, it is difficult to recognize by a machine [4, 5]. Most of the researchers have tried to solve the problems based on the image processing and pattern recognition techniques [6-8].

OCR methodologies can be classified based on two criteria: data acquisition process which can be on-line or off-line and type of the text which is printed text or hand-written text [9, 10]. Both the tasks are challenging for automatic character recognition, specifically in off-line character recognition requires more efforts due to various reasons viz [11-13].



Modeling, simulation and experimental investigation of closed loop MPPT based single phase stand alone photo voltaic system using particle swarm optimization technique

P.V. Thakre¹, V.M. Deshmukh²

¹SSBT College of Engineering and Technology, Jalgaon, India

²SSBT College of Engineering and Technology, Jalgaon, India

*Corresponding author E-mail: pvthakre2006@rediffmail.com

Abstract

Standalone photovoltaic (PV) systems are implemented to perform independently from the utility grid. Such systems are beneficial for certain AC as well as DC loads; that too especially where conventional energy cannot reach. To make such systems more efficient and independent, a closed loop control could be employed. This research paper presents a novel approach to model and simulate a closed loop maximum peak power tracking (MPPT) based single phase stand alone system using particle swarm optimization (PSO) technique. Based on the simulation results, an experimental investigation has been successfully carried out.

Keywords: Controller, converter, filter, inverter.

1. Introduction

Lot of research work is being carried out, in the area of renewable energy sources such as wind, solar, biomass, hydro, tidal, geothermal etc. In the country like India, the potential of solar energy is enormous and also government of India is promoting to install various systems based on renewable energy by implementing various schemes. In PV system, PV modules are having a non linear V-I characteristics and also the performance of modules varies with respect to changing of weather conditions [1]. Therefore an appropriate MPPT technique is essential to be implemented. This research paper concentrates on Perturb and Observe method in order to gain maximum power from the module [2]. The developed model also consists of battery backup which is a critical part of any closed loop PV system. Optimization problems are mostly observed in various fields of power system technology. The fact that many times optimization problems, when modeled in correct way, are of non-convex and also discrete in nature. This has encouraged many researchers to develop and implement new optimization techniques to overcome such difficulties. Particle Swarm Optimization (PSO) is one of the recent developed optimization techniques with many important features. Previous experimentations of employing PSO in many applications in power system technology have indicated potential of such technique. Therefore full bridge inverter with closed loop control using PSO technique is used to generate AC output which has improved the system performance. Based on the simulation results a prototype of 1 kilowatt standalone PV system is developed and practically investigated.

2. Proposed stand alone PV system

The closed loop MPPT based standalone PV system as shown in fig 1 has been modeled to work independently from the grid.

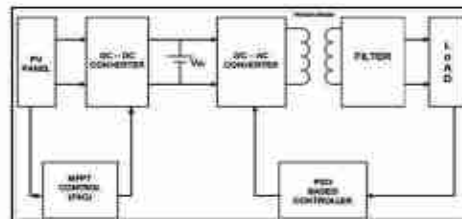


Fig. 1 Block diagram of standalone PV system

From the block diagram it could be observed that the output of MPPT controller is applied to DC-DC converter with adjustable duty ratio in order to improve the performance of DC-DC converter [3]. The inverter block is fed with the feedback controller using PSO technique which senses the voltage and current from the output of inverter and improves the PWM signal fed to the switches of inverter in order to improve the output AC signal. Also at the output side an AC transformer is considered to boost the voltage to get line voltage. In order to reduce harmonics a LC filter is also considered.



Development and Modelling of Automation of Plastic Mat Cutting Machine

Mahesh. V. Rawlani¹

¹Associate Professor, Department of Mechanical Engineering, SSBT's COET
Jalgaon, Maharashtra India.

Dr. Adwait Manoharrao Vaidya²

²Principal, Gangamal College of Engineering, Nagam, Maharashtra-424005

Abstract

To increase the overall productivity of automated plastic mat cutting machine, a model is developed. This paper discusses the synthesis and analysis of developed model. The developed model indicates the productivity (overall) has been increased by 66%. In Prasad polymer traditional foot operated wire cutting machine is use to cut mats which consume more time and labour work so we tried to combine two processes that mat cutting and cutting with sealing which in that industry occur at two different places.

Keywords: Ergonomic, Productivity, Electromagnetism

Introduction

Small scale enterprise has its own significance excellent importance for increasing economic growth not only in developed but also developing countries. It reduces unemployment and poverty and it is a pathway to prosper. Entrepreneurship in rural areas may be developed through the adoption of new technologies not only for improving the productivity and value addition to rural resources also. Workers are the important part of every enterprise and significant to delivering quality products. [1]. Productivity is most other important factors affecting the overall performance in any industry. Ergonomic has usually been used to improve the workers' performance by discovering the factors that contribute to their performance. Robust design is an engineering methodology for obtaining product and process conditions. Taguchi's parameter design is an important tool for robust design. It offers a simple and systematic approach to optimize design for performance, quality and cost. Taguchi's approach is totally based on statistical design of experiments and this can economically satisfy the needs of problem solving and product or process design optimization. By applying this technique one can significantly reduce the time required for experimental investigation, as it is effective in investigating the effects of multiple factors on performance as well as to study the influence of individual factors to determine which factor has more influence and which less [2]. The cutting and sealing process is done by wire cutting method which needs hard work by labour and it's so much time consuming for this we want to replace LASER cutting machine instead of wire cutting process, which saves the time and energy of labour. So considering industry's profit and suggested us to work out for mat cutting with sealing process in his industry. It was a great opportunity for us to troubleshoot

and automate the "Mat Cutting with Sealing Machine" in Prasad Polymats, we tried to combine two processes that mat cutting and cutting with sealing which in that industry occur at two different places.

Literature Review

1. Dr. Vijaykumar P. Wani et al. have concluded that Workstation for deburring process task should be design so that any women workers can adjust to her comfort to work and improve efficiency. The ergonomically designed workstation is a solution to ergonomic and productivity problems in the workplace. A regression model representing worker performance was built based on the experimental work.

2. M.V. Rawlani, Dr. A.M. Vaidya concluded that the micro, small and medium enterprises [MSME] sector contributes significantly to manufacturing output, employment and export of the country. It is estimated that in terms of value, sector accounts for about 45% of manufacturing output and 40% of total export of the country.

3. Shivakumar B. Bhali et al. in their research paper with the help of a survey of ISO & Non ISO manufacturing firms of Karnataka & Maharashtra concluded that SMEs act as a vital component of growing economy.

Objective

1. To study overall marketing strategy adopted by small-scale plastic industries.
2. To study various new worldwide marketing techniques available in the field of plastic industries.
3. To study various allied marketing management strategies adopted by small-scale plastic industries.
4. To suggest long term measures to small-scale plastic industries for sustaining in globalize economy.
5. To evaluate the impact of globalization on marketing strategies of small-scale plastic industries.
6. To increase the efficiency of plant. And to reduce the labour cost and to increase the production rate.

Industrial Processes

Layout of Mat making industry.

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SOLID WASTE MANAGEMENT BY VERMICOMPOSTING

Vijay Kosamkar¹, Prof. F.I. Chavan², Prof. Dr. M. Hussain²

¹ Student ME 2nd year Civil Environmental Engg. ² Assistant Prof. Dept. of Civil Engg.

³ Head & Prof. Dept. of Civil Engg.

^{1,2,3}SSBT's COET Bambhori, Jalgaon (MS), India

*The due increase in population in the country has resulted significant increase in solid waste generation over a last few years. The present paper aims at management of solid waste in regard to vermicomposting to help minimize the quantity upto the extent possible as it is also a cost effective technique. The study aimed to convert vegetable market waste into vermicompost by deploying earth worm species *Eisenia Fetida*. The various parameters like Organic matter, CO₂, C: N ratio, pH value, carbon, nitrogen, etc were observed in analysis. With the vermicompost, the plant growth is improved, soil quality is enhanced which help manage agricultural, domestic waste. Therefore, vermicomposting is highly nutritive organic fertilizer.*

Keywords: C/N Ratio, Vermicompost, Vegetable waste, Earthworms, Municipal Solid Waste

I. INTRODUCTION

India is on the path of rapid industrialization & urbanization. Better work opportunities & the dream of better lifestyle has spread rural migration. The infrastructure development of the boomtown structure has not able to keep waste influx within the cities & the municipalities are straining their limits providing basic service. Solid waste has been major environmental issue in India. MSW in cities is collected by respective municipalities & transport to the outskirts of the city. The limited resources and high amount make them ill equipped to provide high cost involved in collection, storage, transportation, processing etc as a result a substantial part of MSW generated remains unattended and grows in heaps at collection centre. There is a lack of awareness among the peoples about the proper segregation at the source. As India population has been increasing continuously, along this education system also grows continuously.

Solid Waste Management (SWM) is associated with the control of waste generation, its storage, collection, transfer & transport, processing & disposal in a manner that is in accordance with the best principles of public health, economics, engineering, conservation, aesthetics, public attitude and other environmental considerations.

Put differently, the SWM processes differ depending on factors such as economic status (e.g., the ratio of wealth created by the production of primary products to that derived from manufactured goods, per capita income, etc), degree of industrialization, social development (e.g., education, literacy, healthcare, etc.) and quality of life of a location. In addition, regional, seasonal and economic differences influence the SWM processes. This, therefore, warrants management strategies that are economically viable, technically feasible & socially acceptable to carry out such of the functions as are listed below (<http://ojs.iiitb.ac.in/ojs/ijcrt/view/SWMT/IRSS.html>).

Industrial Water Distribution Network Design and Analysis: A Case Study

Nikhil Dhake
PG Student (Environmental Engineering)
Sbt's College of Engineering and Technology, Bambhori, Jalgaon - 425001 (MS) India

Mr. Farooq I. Chavva
Assistant Professor
Sbt's College of Engineering and Technology, Bambhori, Jalgaon - 425001 (MS) India

Dr. Mujahid Husain
Professor & Head of Civil Department
Sbt's College of Engineering and Technology, Bambhori, Jalgaon - 425001 (MS) India

Abstract

This paper concerns for the design of industrial water supply distribution system in India. India is developing country and it has started developing industrial parks to grow industries on local level and to attract foreign investments. Water is basic need of human being and it directly affects human health. Indian government has decided to provide safe, regular and adequate water to the community at their residence. Until now there is no standard specifications available for supply of water in industrial area.

This paper will be helpful to water supply engineers who are facing the problems in designing new distribution network in separate isolated industrial area.

For designing of best economical water distribution system Bentley V8i version is used in this case study. Design procedure satisfies all constraints. The constraints include nodal pressure, velocity of flow in pipe, pipe material, reservoir level, peak factor and available commercial pipe diameters.

In addition to the simulation tool, optimization techniques to identify the least cost design of distribution systems, while achieving the most equitable distribution of water have been developed.

Keywords- Water Distribution Network Design, Industrial Park, Bentley, optimization

I. INTRODUCTION

Safe and adequate water is basic need of human.

The World Health Organization, (WHO Study Group, 1987), defines:

- i. safe water as "water that does not contain harmful chemical substances or microorganisms, in concentrations that cause illness in any form";
- ii. and adequate water supply as "one that provides safe water in quantities sufficient for drinking, and for culinary, domestic, and other household purposes so as to make possible the personal hygiene of members of the household. A sufficient quantity should be available on a reliable, year-round basis near to, or within the household where the water is to be used"

Many Standards and norms are developed until now on water supply standards and norms. But for industrial water supply there are no any firm standard guidelines developed.

Industrial development is need of the era. A basic necessity of industrial development is adequate availability of water. The industrial sector is the second highest user of water after agriculture. Estimates by the Ministry of Water Resources (MoWR) indicate that water used for industry in India is around 7-8 per cent of the total freshwater withdrawal in the country. In the next two decades water consumption will triple current levels. Meeting this unprecedented demand for water with limited availability is the biggest challenge. Water conservation will be definitely the solution for it. Water conservation is defined as any action that reduces the amount of water withdrawn from water supply sources, reduces consumptive use, reduces the loss or waste of water, improves the efficiency of water use, increases recycling and reuse of water, or prevents the pollution of water. All the industrial process do not required potable water. Processed/recycled water can also be used. Fresh Water Consumption can be reduced through Process Improvement and Recycle/ Reuse of Process Water.

II. DESIGN CRITERIA FOR WATER DISTRIBUTION NETWORK

- A. Supply of water
 - i. Water Supply for residential area varies from 70 lpcd to 250 lpcd.
 - ii. Commercial area - depends on type
 - iii. Industrial area- varies with type of industry

Study of Solid Waste Management: Case Study for Khamgaon City

Asiwinil S. Bhagat

Guided By- Prof. F. Chavan

Environmental Engineering (Civil), North Maharashtra University

Abstract— Solid Waste Management (SWM) is a Public term for Garbage management. As human being is living in groups in communities lot of waste is generated and hence Solid Waste Management has become a global issue. Solid waste can be defined as non-liquid waste material that is of no use to human beings. It is generated by domestic Households, Commercial, Industrial, Medical and Institutional activities. Solid waste is one of the major reasons of environmental degradation in India. Improper management of solid waste causes hazards to people.

There are many techniques for Solid Waste Management. The traditional techniques are used in India from a long time, but these techniques are now not so efficient and also cause environmental degradation. This is because of increase in population and change in type of solid waste generation. Many new techniques are introduced for SWM; these techniques are comparatively more effective and have less harmful effects on environment. The Khamgaon city also suffers a problem of municipal waste in planned, economical and safe manner. Present work on SWM for Khamgaon city has been reviewed and efforts have been made to provide comprehensive review on SWM. After analyzing the entire functional element related to SWM various conclusion has been drawn along with recommendations to improve the existing SWM.

Keywords— Municipal Solid Waste Management; Techniques; Suggestions ; Solid Waste ; Management.

I. INTRODUCTION

Humans have always produced trash and have always disposed of it in some way, so Solid Waste Management (SWM) is not a new issue. What have changed are the types and amounts of waste produced, the methods of disposal, and the human values and perceptions of what should be done with it. Improper disposal of solid wastes pollutes all the vital components of the living environment (i.e. air, water and land) at local and global levels. A country such as India, with its high economic growth and rapid urbanization, requires immediate solutions to the problems related to improper management of urban waste. Human activities create waste, and the ways that waste is handled, stored, collected and disposed of can pose risks to the environment and to public health. SWM includes all activities that seek to minimize health, environment and aesthetic impact of solid waste. SWM reduces or eliminates adverse impacts on the environment and human health, also supports economic development and improved quality of life. Bad waste collection practices and improper solid waste disposal contribute to local epidemics of disease, regional water resource pollution, and global greenhouse gases.

In many cities, Municipal Solid Waste (MSW) contains human and animal excrement as well as hazardous chemical pollutants. All facilitate disease and injury. Study of Solid Waste Management for Khamgaon City especially among children, rag pickers and employees in the waste management sector. Studies have shown that a high percentage of workers who handled refuse and of individual who live near or on disposal sites are infected with gastrointestinal parasites, worms and related organisms. Contamination of this kind is likely at all points where waste is handled. Although it is certain that vector insects and rodents can transmit various pathogenic agents (amoebic and bacillary dysenteries, salmonellosis, various parasitoses, cholera, yellow fever, plague, others) it is often difficult to trace the effect of such transmission to a specific population. The implementation of Municipal Solid Waste Management (MSWM) practices benefits both public health and environmental quality directly and substantially.

II. OBJECTIVE OF STUDY

There are following different objectives of my study on Solid Waste Management in Khamgaon City.

1. To study the current situation & major problem in generation, collection, transportation, handling & disposal of solid waste.
2. To gain information on existing techniques and practices of SWM.
3. To Study new techniques of SWM.
4. To reduce harmful impacts of improper SWM on health and environment.
5. To promote Biological recovery of waste and recycling of material.
6. To study the comparison between old and new techniques of SWM for Khamgaon

III. METHODS OF DISPOSAL

A. Landfill

ELECTROCOAGULATION OF WASTE WATER BY USING IRON AND ALUMINIUM ELECTRODE

Suyall D. Avhad
Civil Engg. Dept
SSBT's College of Engg. & Tech.
Bambori, Jalgaon-425001

PROF. F.L.CHAVAN
Sr. Lecturer of Civil Engg. Dept.
SSBT's College of Engg. & Tech.
Bambori, Jalgaon-425001

PROF. Dr. M. Hussein
HOD of Civil Engg. Dept.
SSBT's College of Engg. & Tech.
Bambori, Jalgaon-425001

Abstract—Pollutants in drinking water above permissible level may prove to be hazardous to human health. The present study was carried out to assess the ability of electrocoagulation with Iron and Aluminium electrodes for water treatment process. Electrocoagulation presents a robust novel and innovative alternative in which a sacrificial metal anode doses water electrochemically. This has the major advantage of providing active cations required for coagulation, without increasing the salinity of the water. Electrocoagulation is a complex process with a multitude of mechanisms operating synergistically to remove pollutants from the water. A wide variety of opinions exist in the literature for key mechanisms and reactor configurations. A lack of a systematic approach has resulted in a myriad of designs for electrocoagulation reactors without due consideration of the complexity of the system. A systematic, holistic approach is required to understand electrocoagulation and its controlling parameters.

In this project, electrocoagulation with Iron and Aluminium electrodes will be carried out and a comparative study will be investigated. Several key parameters affecting the efficiency of electrocoagulation will be investigated with laboratory scale experiments in search of optimal parameter values. Optimal values of parameters will be determined on the basis of the efficiency of hardness removal from ultrafine suspensions. Various parameters that would be studied are pH, chlorine content, alkalinity and voltage. Parameters affecting electrocoagulation process, such as initial pH, applied voltage, COD and time of electrocoagulation process would be investigated.

Keywords— Electrocoagulation, conventional coagulation, PH, electrolyte, composition, hardness, conductivity, turbidity.

1. INTRODUCTION

Today water pollution is a major problem. People have been trying to find out of cost-effective and eas method to purify water. One such sustainable water treatment method is electrocoagulation (EC) which has the potential for treating a wide spectrum of contaminants in drinking water. Electrocoagulation (EC), also known as radio frequency diathermy or short wave electrolysis, is a technique used for wash water treatment, wastewater treatment, industrial processed water, and medical treatment. Electricity-based electrocoagulation technology removes contaminants that are impossible to remove by filtration or treatment systems, such as emulsified oil, total petroleum hydrocarbons, suspended solids, and heavy metals. Presently electrocoagulation is marketed by a small number of companies around the world as it is proving to be an effective method for the treatment of the turbid water for the clarity and purity of water. Since suspension of the clay particles in the water is main reason behind turbidity, EC treatment has been used to coagulate kaolinite and bentonite suspensions. A variety of designs have been employed with no dominant design. Often the electrocoagulation units are used simply as a replacement for chemical dosing systems and do not take advantage of the electrolytic gases produced in the electrocoagulation process. Electrocoagulation – electro floatation (ECF) technology is a treatment process of applying electrical current to treat and flocculate contaminants without having to add coagulants. Stated that coagulation occurs with the current being applied, capable of removing small particles since direct current applied, setting them into motion. Also electrocoagulation could reduce residue for waste production. Electrocoagulation has been proposed in recent years as an effective method to treat various wastewaters such as landfill leachate, restaurant wastewater, saline waste water, tar sand and oil shale wastewater, urban wastewater, laundry wastewater, nitrate and arsenic bearing wastewater and chemical mechanical polishing wastewater. Electrocoagulation consists of pairs of metal sheets called electrodes that are arranged in pairs of two – anodes and cathodes. Using the principles of electrochemistry, the cathode is oxidised (loses electrons), while the water is reduced (gains electrons), thereby making the wastewater better treated. When the

EFFECT OF CEMENT ON THE HEAVE OF AN EXPANSIVE SOIL

Vijay Kankar¹, Prof. P.L. Chavan², Prof. P. R. Patase³, Prof. Dr. M. Hussain⁴
¹Student ME 2nd year Civil Environmental Engg., ^{2,3} Assistant Prof. Dept. of Civil Engg.,
⁴ Head & Prof. Dept. of Civil Engg.,
^{1,2,3,4}SSBT's COET Bambhori, Jalgaon (MS), India

ABSTRACT

Expansive soil, called shrink-swell soil, also is very common cause of foundation problem. Depending upon the supply of moisture in the ground, shrink-swell soil will experience changes in volume of up to thirty percent or more. Foundation soils which are expansive will "heave" and can cause lifting of a building or other structure like pavements, embankments during period of high moisture. An attempt has been made in this study to check the heave behavior of expansive soil with the addition of cement. The soil collected from Vrindavan garden is use for project. The properties of soil sample have determined. The results of ARD and heave are compared between original soil samples and modified with cement. The heave of expansive soil is reducing to great extent with the use of cement. The use of cement in soil to reduce heave is an effective method.

Keywords: Expansive soil, cement, Optimum moisture, Maximum Dry Density, Heave.

INTRODUCTION

Expansive clays, which are rich in mineral monomorphous, absorb water during monsoon and undergo swelling as a consequence. Expansive soils are those which show volumetric changes in response to changes in their moisture content. During summer, the water evaporates and

cause shrinkage of the soil. This alternate swelling and shrinkage with moisture fluctuations causes strains in the structures built in

them and, as a result, the structures are distressed. Single-storey and two-storey buildings, pavements,

curb beds and linings, retaining walls are some of the structures which undergo distress.

The expansive soil hazards are often caused by water swelling and dehydration shrinkage, the swelling deformation of expansive soil contains two categories which are internal layer expansion and lattice expansion. The latter is the expansion of expansible minerals, the lattice expansion since the obvious expansions of mineral volume cause by water entering which is one part of the mineral compositions or lattice.

Heave arises during freezing owing to cryostatic suction effects that can increase the upward water penetration to facilitate ice-lens growth and resultant heave. The main aim of project is to study the effect of cement on the swelling of soil. The effect of cement on the heave of expansive soil was determined experimentally.

This paper describes the experimental set up used for the project, and also the material and procedures adopted for laboratory testing.

A. Swelling & Shrinkage in Expansive Soil

As clay particles are formed, there are usually several points in the particle arrangement where there is an electrical imbalance is increased whenever a "string" of clay particles is broken apart. Thus, the result is that a clay particle typically has a negative net electrical charge on its surface. Whenever a water molecule drifts close enough to the surface of clay particle, the negatively charged surface of the clay particle causes the positive end of the water molecule to turn toward the particle and

Removal of Fluoride using iron (Fe^{3+}) and magnesium (Mg^{2+}) calcinated layered double hydroxide (LDH) coated on silica surface as adsorbent

Tejowini Patil¹, Dr. M. Hussain², P. R. Phanse³

¹PG student, Dept. of Civil Engg., ²Professor & Head, Civil Engineering Department, ³Assistant Professor
^{1,2,3}SSBT College of Engineering & Technology, Bambhori, Jalgaon, MH, India

Abstract:

Fluoride and fluorosis issues are common in a few nations including India. Fluorosis is pandemic in more than 20 states of India. The fluoride comes into ground water by various ways, for example, weathering of rocks, industrial effluents and geochemical reactions. Fluoride in overabundance amount higher than 1.5 mg/l causes dental and skeletal fluorosis other than infertility, kidney harm and affects nervous systems as well. The fluoride removal from drinking water and wastewater has been successful by different techniques, for example, coagulation and precipitation, adsorption, ion-exchange, membrane separation, dialysis, electro-dialysis, electrocoagulation and so on. Adsorption process for defluoridation has favoured for the most part in developing countries as it is techno-economical viable method, environmental friendly and straightforwardness in operation. The present study examines the use of iron (Fe^{3+}) and magnesium (Mg^{2+}) calcinated layered double hydroxide (LDH) coated on silica surface as adsorbent for removal of Fluoride from drinking water. Present work shows that the Fe and Mg compounds can be effectively coated on silica gel to synthesize a granular adsorbent which can be effectively used for removal of many anions from aqueous phase. Low cost of the chemical, easy synthesis and high recovery of fluoride ions are additional advantages of this method.

1.0. Introduction:

Presence of various hazardous contaminants like fluoride, arsenic, nitrate, sulfate, pesticides, other heavy metals etc. in underground water has been reported from different parts of India. In many cases, the water sources have been rendered unsafe not only for human consumption but also for other activities such as irrigation and industrial needs (Rukah and Alsokhny, 2004). In India, fluoride is the major inorganic pollutant of natural origin found in groundwater.

Fluoride in drinking water and toothpaste attracts public attention nowadays whereas fluoride as a strong oxidant is added to many drinking waters in small quantities to prevent dental caries (Bomim, 1997). Generally, fluoride is carcinogen a bone seeker and is linked to hip fractures and brittling of bones (Pentchuk *et al.*, 1986). All salts of fluoride are toxic but some of them more or some less.

The treatment methods that are known for removal of fluoride are electrodialysis, adsorption, electrochemical, ion exchange and biological defluoridation. The adsorption process in general, is considered better among other wastewater treatment technologies because of the low cost, simple design and easy operation.

Impact analysis of air pollution along NH6 through Jalgaon city

Akran Shrivastava
Student
SSBT's COET Bambhori Jalgaon

Prof. Dr.M.Hosain
HOD Civil
SSBT's COET Bambhori Jalgaon

Prof.Yakub Ansari
Assistant Professor
MMATEC, Moinasara Mulgaon

Abstract:- Air pollution is one of the serious problems faced by peoples in developing countries like India. The urban areas in India, which have not only experienced a rapid growth of population but also by growing number of vehicles. The major causes of increased emission of pollutants in urban areas include the use of poor quality fuel, traffic congestion and badly maintained motor vehicles. The impact of vehicular pollution on human health in urban areas is at peak level as vehicle emissions are near the ground level where people live and work. Most of the Indian Cities are also experiencing rapid urbanization and the majority of the country's population is expected to be living in cities within a span of next two decades. This report presents "Impact analysis of air pollution along NH6 through Jalgaon city".

Key Words:- Hydrocarbon (HC), sulphur oxide(SO₂), Carbon monoxide(CO) and Carbon dioxide(CO₂)

1-Introduction:-

Air pollution is one of the serious environmental concern of the urban Asian cities including India where majority of the population is exposed to poor air quality. The health related problems such as respiratory diseases, risk of developing cancers and other serious ailments etc. due to poor air quality are known and well documented. Besides the health effects, air pollution also contributes to tremendous economic losses, especially in the sense of financial resources that are required for giving medical assistance to the affected people. The poor are often the most affected segment of the population as they do not have adequate measures to protect themselves from air pollution.

Most of the Indian cities are also experiencing rapid urbanization and the majority of the country's population is expected to be living in cities within a span of next two decades. Since poor ambient air quality is largely an urban problem this will directly affect millions of the dwellers in the cities. The rapid urbanization in India has also resulted in a tremendous increase the number of motor vehicles. As the number of vehicles continues to grow and the consequent congestion increases, vehicles are now becoming the main source of air pollution in urban India.

The effect of air pollution includes breathing and respiratory problems, aggravations of existing respiratory and cardiovascular diseases, alterations in the body defense system against foreign materials and damage to lung tissues and carcinogenesis. Air pollution is influenced by four major factors, namely industrialized expansion of the cities, increase in traffic, rapid economic development, and higher level of energy consumption. The growth of, both, an industrial and residential area is unplanned in many developing cities of India, thus, contributing to the air pollution problems. In urban areas, the mobile or vehicular population is predominant and significantly contributes to air quality problems. Automobiles produces volatile organic compounds (VOC), suspended particulate matter (SPM), oxides of sulfur (SO_x), oxides of nitrogen (NO_x) and carbon monoxide (CO), which have adverse effects on surrounding ecosystem.

In order to study the impact of vehicular pollution along the highway (NH-6) passing through Jalgaon city is selected. Jalgaon city is the trade and commercial center of North Maharashtra Region, India. Jalgaon

Wastewater Management in a Sugar Factory

Mr. Khalid Iqbal¹, Prof.F.Chavan², Prof.Dr.M.Husain³, Prof.Yakub Ansari⁴
*Student SSBT's COE Bambhori Jalgaon¹, Assistant Professor SSBT's COE Bambhori Jalgaon²,
HOD Civil SSBT's COE Bambhori Jalgaon³, Assistant Professor MMANTC Mansoora Malegaon⁴*

Abstract: Sugar industry is one of the major and the oldest industry in India. It plays a very important role in the country's economy. Sugar industries are generally located in U. P., Bihar, Maharashtra, Punjab, Andhra and Tamilnada states in India. India stands second in terms of sugar production in world. Considering the wide spread region of the industry and its rapid growth and significance, the wastewater of industry needs due considerations. Sugar industry wastewater is basically a readily biodegradable organic wastewater. The wastewater of sugar industry contains high BOD, nearly natural pH, high biodegradability, nutrient deficiency and sulfates. All type of biological treatment are found to be successful, but the seasonal nature of the industry is a major drawback against the feasibility of biological treatment. The broad objective of the present work is to study the environmental performance of a sugar factory and to suggest improvements in the same.

Key Words: Bagasse, Molasses, Anaerobic lagoons, UASB.

1-Introduction:-

Sugar industry is one of the most important food processing industries of the world. Generally beet and sugar canes are used as a raw material for the manufacturing of sugar, all over the world. But in India, sugarcane is the sole raw material for this. Sugar is produced in 120 countries. Global production now at around 180 million tons a year. Approximately 80% is produced from sugar cane, which is largely grown in tropical countries. The remaining 20% is produced from sugar beet, which is grown mostly in the temperate zones of the northern hemisphere. 70 countries produce sugar from sugar cane, 40 from sugar beet, and 10 from both. The 10 largest sugar producing nations represent roughly 75% of world sugar production. Brazil alone accounts for almost 25% of world production.

Sugar is produced in 120 countries. Global production now at around 180 million tones a year. Approximately 80% is produced from sugar cane, which is largely grown in tropical countries. The remaining 20% is produced from sugar beet, which is grown mostly in the temperate zones of the northern hemisphere. 70 countries produce sugar from sugar cane, 40 from sugar beet, and 10 from both. The 10 largest sugar producing nations represent roughly 75% of world sugar production. Brazil alone accounts for almost 25% of world production. India stands second in terms of sugar production. Sugar industry is the oldest industry in India. The global sugar production described in fig 1.

Road Aggregates from Industrial Polymer-Waste

Shridhanwar N. Doshmukh
Associate Professor, Civil Engineering Department,
S.G.D. College of Engineering, Jalgaon, M.S., India.

Dr. Mujahid Hussain
Professor and Head, Civil Engineering Department,
SSBT's CDEET, Bambhori, Jalgaon, M.S., India.

Abstract— Considerable amount of polymer waste is being generated during filtration stage in manufacturing process of recycled rigid PVC pipes. Locally, this waste is called as *Jauli Gula*. It contains stone and metal particles along with major portion of crumb, non-recyclable polymer waste. This waste is great environmental nuisance. The present work has attempted to investigate the feasibility of this polymer waste to be used as aggregates in road work applications. The pipe industry polymer wastes are cut by a cutting machine and particles like natural coarse aggregate are obtained. These particles are called Waste Polymer Aggregates (WPA). These are subjected to different tests recommended by IS codes and the test result indicates that WPA are suitable to be used in bituminous road as a substitute to traditional coarse aggregates. Efforts are also taken to calculate cost of materials per kilometre length of a bituminous road of 3.7 metre width, considering WPA as coarse aggregate for road construction. Calculations show that, total cost of materials in case of waste polymer aggregate road is considerably less than that for a usual stone aggregate road. Further, WPA are also tried with bitumen, as a mix, in an experimental work of repairing of pot holes of an existing bituminous road pavement. The repaired road was observed for a period of more than one year. It is found that WPA-bitumen mix is better in the pot holes and no considerable damage has occurred to it due to traffic. Since WPA-bitumen mix is performing well in the repaired pot holes, WPA can further be used on large scale in construction of bituminous road pavement. Thus, the outcome of the entire work shows a way to solve the problem of disposal of pipe industry polymer waste in an eco-friendly manner. There will be added advantage of its use since the natural aggregates are getting scarce day by day. Their over exploitation is not only creating environmental nuisance but is also creating socio-economic and political conflicts. The present work thus attempts to solve a real life problem with simple stroke.

Keywords— Waste Polymer, Coarse Aggregates, Recycled pipe, *Jauli Gula*, Bituminous Road, Pot Hole.

I. INTRODUCTION

Plastics are being extensively used now-a-days almost in all walks of life due to the advantages available from their different varieties and amazing properties. Since plastic are comparatively affordable material due to their low cost and suitability at most of the places of its intended use, it is gaining popularity day by day. Due to rapid growth in population and industrialization, use of plastics has constantly increased during past years all over the world, particularly in developing countries like India. In the present era, use of plastic has increased to such an extent that, one can't even think life without using plastics. Such an extreme use of plastics naturally gave rise to generation of high volume of its waste. Studies have shown that thousands of tons of waste plastics are being generated every day across the world. Since plastic is not a green (eco-friendly) material, the question of its proper disposal should be viewed seriously. It is not even easily biodegradable and takes more than thousands of years for its complete natural decomposition. [1] Scientists, environmentalists and researchers have consistently warned people against direct dumping of waste plastics in open ground or into the available water bodies due to its catastrophic effects on the entire ecosystem. Studies have shown that open burning of waste plastics or using the same for area reclamation or land filling is even more dangerous to the environment, since this leads to further increase in soil (land) pollution, water pollution and air pollution through high degree. So the question is what to do with such a tremendous amount of plastic waste which is getting generated every day. [10] One of the answers to this question may be to utilize this waste in some appropriate and innovative manner.

Considering the benefits, efforts are being taken to utilize waste materials as alternative aggregates in preparation of cement concrete that is used for different construction works. Significant research is made on the use of many different materials as aggregate substitute such as coal ash, blast furnace slag, fibre glass waste materials, waste plastic, rubber waste, slotted sludge pellets and others. [3], [14]

II. SOURCE OF POLYMER WASTE

Many pipe factories use required type of plastic scrap as their raw material to manufacture rigid pipe. Therefore such pipes are called as recycled plastic pipes. In filtration stage of manufacturing process of these recycled plastic pipes, the pulverized plastic scrap is melted and injected through steel wire mesh in hot condition at a temperature 170-200 °C. When the filter mesh gets completely blocked because of impurities and other foreign particles present in plastic scrap, the injected material further comes to flow out of filter mesh. The blocked mesh is then replaced by a new one and filtration process is continued. When the blocked mesh and mass of polymer waste (adhered to mesh) cools down they are separated out from each other. This separated mass of impure plastic waste is locally called as *Jauli Gula*. It contains usually stone and metal particles along with major portion of impure and non-recyclable polymer waste. In a day, considerable amount of such polymer waste is getting generated and there is a big question of its disposal. [9] Since non-recyclable polymer waste is a great nuisance to environment, it is taken for study in the present work in a view to make an attempt to find a safe way of its disposal. Particles like natural coarse aggregate are obtained when *Jauli Gula* (mass of waste polymer) are applied to the cutting machine. This required quantity of Waste Polymer Aggregates (WPA) is derived through cutting machine available at the manufacturing plant. [14]

Thermoelectric Generator System for Generation of Electric Power through Waste Heat Energy from Two Wheeler Silencer

Dr. D. S. Deshmukh¹ Mr. P. M. Solanki² Dr. V. R. Diware³ Dr. S. P. Shekhawat⁴

¹Associate Professor, DHACKER, YCTE Campus, Pimpri-Chinchwad, Naggur, Naggur, (M.S.), India.)

²Research Scholar, Mechanical Engineering, SSBT's COET, Bambhori, Jalgaon, (M.S.), India.)

³Associate Professor & Head, Chemical Engineering, SSBT's COET, Bambhori, Jalgaon, (M.S.), India.)

⁴Professor & Head, Mechanical Engineering Dept., SSBT's COET, Bambhori, Jalgaon, (M.S.), India.)

Abstract—A number of irreversible processes in the engine limit its capability to achieve a highly balanced efficiency. These rapid successions of events happening in the cylinder create expanding exhaust gases with pressures that exceed the atmospheric level, and they must be released while the gases are still expanding to prepare the cylinder for the following processes. By doing so, the heated gases produced from the combustion process can be easily channelled through the exhaust valve and manifold. The large amount of energy from the stream of exhausted gases could potentially be used for waste heat energy recovery to generate power. Various methods to harness the waste heat to produce power effectively had ended up in vain. This paper proposes and implements a thermoelectric waste heat energy recovery system for internal combustion engine automobiles, including gasoline vehicles. The key is to directly convert the surface heat energy from automotive waste heat in electrical energy using a thermoelectric generator (TEG). The experimental results demonstrate that the proposed system can work well under different working conditions, and is promising for automotive industry.

Keywords— Thermoelectric Generator, Waste heat from two wheeler silencer, TEG Module, heat source.

I. INTRODUCTION

There is no system which converts total input energy into output energy practically, there are some losses. In the universe there is no system which is 100% proficient, due to losses system effectiveness decreases in real practices. Automobile sector are an example of high energy usage with low competence. It has 30% efficiency and roughly 75% of the energy produced during combustion and roughly 75% of the energy produced during combustion is lost in the exhaust or engine coolant in the form of heat. If this energy is tapped and transformed into functional energy, the overall efficiency of an engine can be improved. Thermoelectric technology can be used to generate electrical power from waste heat. Thermoelectric generator utilizes the Seebeck effect which was first observed in 1821. Thermoelectric generator practically came into existence in 1960 which were developed appreciably and since then number of manufacturers are now marketing thermoelectric modules for power generation, heating and cooling applications. Constant research and advances in thermoelectric materials and manufacturing techniques, enables the technology to make an increasing efforts to address the growing low power energy sources typically used in energy harvesting and scavenging systems. Thermoelectric generator can be used to generate a small amount of electrical power, typically in the microwatt (μ W) range, if a temperature difference is maintained between two terminals of a thermoelectric generator.

The hottest of exhaust gas pipe of an engine is very high when exhaust gases are flowing through it and that is around 200°C to 300°C. Thermoelectric generator is model for such applications as they are small, with no moving parts and relatively efficient at this temperature. Thermoelectric generator is basically solid state devices that are used to convert thermal energy from temperature gradient to electrical energy. By using waste thermal energy through IC engines exhaust to charge the battery instead of using an alternator the overall fuel economy can be increased by 10%.

II. PROBLEM STATEMENT

There is need of waste heat recovery because we are facing the problem of energy crisis in terms of conventional sources of energy. By using waste heat we can save not only conventional sources of energy but also we can enhance the efficiency of these sources of energy. By using waste heat we can go along with sustainable development in an easy way as it is the demand of today's world. It is better to have something rather than having nothing and in the case of heat recovery we are saving more amount of energy which we can use not only for our self but also for upcoming generation. In general we can say that by saving waste heat we are not only securing our self but also upcoming generation from facing the problem of energy crisis which is the current issue of today's world and it also play an important role in making India a developed country as energy plays an important role in other dimensions which are related to our economic zones.

III. OBJECTIVES

The main focus of this paper is to develop experimental setup for conversion of waste heat energy (from Silencer of Two Wheeler) into electricity using thermoelectric generator (TEG). In this the conversion of waste heat directly into electricity by using thermoelectric generator. Waste from automobile exhaust heat, refrigerator heat, vehicle radiator heat, can be used as an input source as a waste heat to generate electricity. The objective of this paper is to study thermoelectric generator performance

Mathematical Model Formulation for Investigation of Influence of Air Induction Pressure as an Operating Variable on a Stationary Compression Ignition Engine Performance

Dr. Dheeraj. S. Deshmukh
Associate Professor,
Mechanical Engineering
DRACER, YCCE Campus,
Wanandongri, Nagpur.

Dipak C. Tulete
Research Scholar & ASME Prof.
Mechanical Engineering
SSBT's, COET,
Bambhori, Jalgaon

Dr. V. S. Patil
Professor,
Chemical Technology, UICT
North Maharashtra University
Jalgaon.

Dr. S. P. Shekhawat
Professor, & HOD
Mechanical Engineering
SSBT's, COET
Bambhori, Jalgaon

Abstract— Operating parameters of any particular Compression Ignition engine are firstly critically reviewed. Then by using the theories of engineering experimentation design of experiments is done. Dimensional analysis technique is used for formulation of mathematical model. Internal Combustion engines subject area is especially important as per the environmental aspects are concerned. Design of each machine is having common objectives, first is to obtain highest possible efficiency and another is to obtain minimum possible environmental degradation. The Induction pressure acting on engine is most important operating parameter of engine. The present work Shows vital scope for improvement of operating performance of engines by taking wider operating range in case of each engine.

Keywords— Air Induction Pressure, Efficiency, Compression Ignition Engine, Performance

1. INTRODUCTION

Operating parameters of an internal combustion engine are discussed here, for the study of the effects of different parameters on engine performance. Engine performance is dependent on fuel consumption, which bears direct influence on efficiency and engine out emissions. So, fuel consumption rate is a basic dependent variable. It is an important parameter of an engine, varies because of any possible variable variations such as engine design (its operating conditions) & fuel (type of fuel) and After treatment system (flow resistance offered by exhaust system). Based upon the literature reviews, the following different variables are selected for reduction of variables using dimensional analysis technique. Different π - terms are obtained, using Buckingham's π -theorem. Let us begin here with a basic but essential step in the experimental investigation, different input and output variables are briefly discussed below.

The indicator diagram of a four-stroke diesel engine cycle, as shown in the figure-1, consists of two enclosed areas. The large area represents the gross work done. The smaller shaded area, formed by the suction and exhaust operations is called pumping loop and represents the loss of work due to exhausting of burnt gases and admission of new unburnt gas or charge. This work obtained from the negative area is to be deducted from the gross work to obtain the net work done. The pumping loop is shown magnified in figure for explanation purpose. The gas exchange processes affects the volumetric efficiency of the engine. The performance of the engine, to a great deal, depends on the volumetric efficiency.

During the exhaust stroke when the piston moves from bottom dead centre to top dead centre, pressure rises and gases are pushed into exhaust pipe. Thus the power required to drive the exhaust gases is called the exhaust stroke loss and increase in speed increases the exhaust stroke loss. The indicator diagram of a diesel four-stroke cycle engine shows the suction line "ca" lies below the atmospheric pressure line. This fall of pressure below the atmospheric pressure is a result of the restricted area of the inlet passages, due to the restricted area, the entering air cannot flow into the cylinder in sufficient quantity to keep the pressure with the rapidly moving piston. With the use of supercharger the air pressure of the inlet on I.C. engine can be increased which results in decrease in the negative loop of the indicator diagram of a 4- stroke diesel engine cycle. This can increase the net work done.

Design of Experimental Plan for Effect of Liquefied Petroleum Gas Analysis on Friction Power Loss in Spark Ignition Engine

Dr. Dhairaj Nishikant Deshpande^{1*}
¹Associate Professor
Mech. Engrg. Dept. DR. J.C.R.
Nagpur (M.E.) India

Parulik Nivrutti Patil^{2*}
²Ph.D Research Scholar
Mech. Engrg. Dept. NITWDR,
Jalgaon (M.E.) India.

Dr. Vilas Nitesh Patil^{3*}
³Professor, Mech. Engrg. Dept.
University Institute of Chemical Tech.
NITW, Jalgaon (M.E.) India.

Abstract:

Internal combustion engine running on Liquefied Petroleum Gas are well proven technologies and work much like gasoline-powered spark ignition engine. This is normally used in spark ignition engines for fit finished petrol and LPG vehicles. Increasing focus on liquid petroleum gas (LPG) as clean, relatively low in cost and abundant source of energy to provide affordable fuel-efficient transportation, needs research for optimization approach to manage fuel, air, and combustion to achieve best result in vehicle power, fuel efficiency and low emissions. However power output of LPG fueled engine is reduced by 10-15% compared to petrol fuel.

In this study, exhaustive literature survey is carried out and experimental setup is discussed for further investigation. Main task is to evaluate effect of LPG on various performance parameters of the engine like brake, indicated and friction power, thermal efficiency, fuel consumption, volumetric efficiency. Existing multi-cylinder petrol engine is modified for required set up in which Morse test, heat balance sheet and engine oils are also to be analyzed for tribological behavior of engine.

KEYWORDS: Brake Power, Frictional Power Loss, Dynamometer, Engine Efficiency, Indicated Power

1. Introduction

In the recent years, one of the major areas of research in the field of IC engine is use of alternative fuels. Gaseous fuels or LPG are providing alternative fuels for their higher octane number, higher calorific value and of course lower exhaust emission. Because of these advantages very recently and better results have been obtained in terms of fuel efficiency and particularly the exhaust emission. Alternative fuels are very useful in reducing the pollution from conventional IC engines. Besides, alternative renewable fuels can play a major role in the economy of a country as well as the health of living beings of the globe. The composition varies depending on the source. Some of the important properties of petrol and LPG are listed below.

Table 1 : Properties of LPG and Petrol Fuels

Characteristics	Petrol	LPG
Chemical Formula	C ₈ H ₁₈	C ₃ H ₈ , 60% C ₄ H ₁₀ , 20%
Lower Heating Value	47500	46500
Density at 15°C, kg/m ³	750	520
Stoichiometric Air-fuel ratio	14.7	15.4
Flame speed cm/s	37.3	37.9
Upper flammability limit in air, Kg of Air/kg	7.6	5.0
Lower flammability limit in air, Kg of Air/kg of fuel	1.4	0.6
Auto ignition temperature (°C)	371	403-430

* Source Indian Oil Corporation Ltd. (India) 1993

The performance of engine under variable operating condition like different speed and variable load conditions with necessary modification required for the smooth running of engine.

Purpose of Morse Test :

Purpose of Morse test is to find the approximate indicated power of a multi-cylinder engine fueled by gasoline and Liquefied Petroleum Gas which consist of running the engine against the dynamometer at a particular speed, cutting out the firing

Performance Analysis of Hot Water Storage Tank in Solar Water Heating System with Different Insulation Using ANSYS

Dr. Dharaaj, S. Beshmukh
Associate Professor,
Mechanical Engineering
DNACER, YCCE Campus,
Wanadongri, Nagpur

Mallesh V. Kulkarni
Research Scholar & Asstt. Prof.
Mechanical Engineering
SSBT's, COET,
Bambhori, Jalgaon

Dr. S. P. Shukhawat
Professor, & HOD
Mechanical Engineering
SSBT's, COET
Bambhori, Jalgaon

Abstract – Analysis of solar domestic hot water (SDHW) storage tank carried out by using CATIA and ANSYS software. The tank fluid is in steady mode. The storage tanks made up of MS plate, 50 mm Polyurethane, Glass wool and Rockwool insulation, outer-cladding cover. Hot water storage tank model made in CATIA software and effect of different insulation materials such as Polyurethane, Glass wool and Rockwool analyzed in ANSYS. Due to improper insulation material the ambient hot water temperature inside the tank drops after of certain period due to heat diffusion and natural convection from the tank walls and it is difficult to get constant temperature all the time. To keep constant temperature polyurethane is best insulation than Glass wool and Rockwool. Also for minimum night heat losses polyurethane is best insulation than Glass wool and Rockwool.

Keywords— Polyurethane, Glass wool, Rockwool, Solar Hot Water Storage Tank, CATIA and ANSYS

I. INTRODUCTION

To minimize the loss of heat during the night the heat insulation of the storage tank of a solar thermal system is of vital importance. Typical insulation materials are foamed polyurethane, polyethylene or polypropylene, at least 100 mm thick. Alternatively also organic materials made from cellulose or raw wool can be used, demanding a somewhat higher thickness (i.e. more layers of insulation) to get the same effect. Since solar storage tanks are thermally stratified – with cold-water layers at the bottom and hot-water layers at the top – many state-of-the-art tanks are asymmetrically insulated, meaning an increasing insulation thickness from bottom to top.

II. TYPES OF INSULATING MATERIALS

POLYURETHANE FOAM

Polyurethane foam is widely used in high resilience flexible foam seating, rigid foam insulation panels, microcellular foam seals and gaskets, durable elastomeric wheels and tires, automotive suspension bushings, electrical potting compounds, seals, gaskets, carpet underlay, and hard plastic parts (such as for electronic instruments).

One of the best commercially available choices of insulation material is polyurethane foam. It has good thermal insulating properties, low moisture-vapour permeability, and high resistance to water absorption, relatively high mechanical strength and low density. In addition, it is relatively easy and economical to install.

Polyurethane foam is effective as an insulator because it has a high proportion (90 percent minimum) of non-connected closed microcells, filled with inert gas. Until recently, the inert gas most commonly used in polyurethane foams was R-11 (trichlorofluoromethane).

IMPROVEMENT IN DESIGN OF FLYWHEEL TO INCREASE EFFICIENCY OF HUMAN EFFORTS TO GENERATE ELECTRICITY

Mukesh A. Marathe⁰¹, Pravin D. Patil⁰², M. P. Mahabadi⁰³

Assistant Professor⁰⁰⁰⁵

SSBT's College of Engineering and Technology, Bambhori, Jalgaon (M.S.) India⁰⁰⁴
G.H. Raisoni Polytechnic, Jalgaon (M.S.) India⁰³

Abstract

Power Generation using Human Effort is a force for the future. With increasing demand for fuel and a new source of energy, development of human powered generators becomes a necessity. The most famous human powered generator is dynamo. On similar lines various human powered generators like backpack generators, biomechanical energy harvester and shoe generator are being developed. These harvesters are under development and are considered one of the best inventions of recent times. One such way is to develop alternate source of energy which will help us to save energy. Geothermal energy, biogas, solar energy, wind energy are various forms of energy which are used alternatively today. One such source of energy is Human Power. Human power is an endless source of energy which has been wasted. The energy is stored in a mechanical form and retransmitted to the wheel in order to help the acceleration. Electric vehicles and hybrid have a similar system called Regenerative Brake which recovers the energy in the batteries. The device recovers the kinetic energy that is present in the waste heat created by the car's braking process. It stores that energy and converts it into power that can be called upon to boost acceleration. There are principally two types of systems - battery (electrical) and flywheel (mechanical). Electrical systems use a motor-generator incorporated in the car's transmission which converts mechanical energy into electrical energy and vice versa.

Key word: X- Cross section Flywheel, Battery (electrical), Geothermal energy, Pulley, Paddle, polar moment of inertia.

1. INTRODUCTION

The cost of fossil fuel is increasing day by day as well as government policy is also towards the minimization of atmospheric pollution. Bicycle is an economical and pollution free vehicle for controlling the atmospheric pollution, which is not depending on crude oil. Government is also taking many steps to make use of renewable resources. The use of fossil fuels and other non-reusable sources of energy must be reduced to keep emissions low and alleviate the use of diminishing resources. The idea of human powered generation has been implemented in many different situations. Some examples include hand-crank radios, shaking flashlights, and receiving power from gym equipment. The use of exercise equipment for a clean source of energy would be an even more fun experience for participants and provide a means to exercise and generating power. The flywheel based bicycle generator utilizes human energy to produce electricity quickly and efficiently. The goal is to provide technological solution to problem in the rural world by using detailed opportunity recognition, evaluation, and development of prototype. The prototypes are then turned over to the developing world for manufacturing, distribution and use. Less commonly, pedal power is used to power agricultural and hand tools and even to generate electricity. Some applications include pedal powered laptops, pedal powered grinders and pedal powered water wells. Some third world development projects currently transform used bicycles into pedal powered tools for sustainable development. Human powered generation gives a power source that is not directly derived from natural sources. An example is a human powered generator operated in absence of solar irradiation, wind and water. The power generated from pedal is perfect for remote areas, hilly regions, strategic location, islands etc., where electricity

Study of Closed Loop Control for AC Motor Using Matrix Converter: A Review

Ms. Rupali D. Dole, Dr. P. V. Thakre,
SSBT College of Engineering and Technology

Abstract—Considering the wide applications of motors in various applications in diversified field, it has become necessary to have proper control to fulfil the necessary task. Also different applications have different requirement in terms of voltage, current and power and at the same time to improve its performance, the parameters such as total harmonics distortion (THD), ripples, losses are to be controlled. So in case of AC-AC conversion, to minimize the conversion stages, matrix converters are becoming more popular for closed loop control for ac motors. Also with proper switching of devices in matrix converter, could improve the quality of output by the application of appropriate PWM technique. This paper reviews the different closed loop control strategies used in AC motor as well as the application of matrix converters with appropriate PWM control.

Index Terms—Matrix converter, closed loop control, PWM technique.

INTRODUCTION

As various industrial applications which require signals with different amplitude, frequency or phase, ac to ac power conversion plays a very vital role. In such system ac to ac converter take power from one system and feeds to another ac system as per the required parameters such converters could be classified as direct or indirect converters. Direct converters are preferably used. Direct converters could be classified into three types i.e. AC controller, cycloconverters and matrix converter out of these three topologies matrix converter is the most versatile converter as it reduces the number of conversion stages. The other advantages of matrix converters are,

- They provide sinusoidal input and output waveforms with reduced higher order harmonics.
- Have capability of bidirectional energy flow with power factor control.
- Eliminates the used of bulky capacitors.

Considering the advantages of matrix converter this research paper reviews the work done by different researchers in the area of matrix converter with closed loop control. Based on the review a conclusion has been made at the end for carrying out the work on matrix in further direction.

I. CONVERTER SYSTEM FOR AC DRIVES:

As stated earlier there are three types of converters out of which matrix converter is the most suitable type of converter which could be applicable for ac drive applications. Considering the scope of matrix converter for ac drive applications various research paper are reviewed based on which the following study has been put up. As stated in [1], a three phase matrix converter consisting of 3×3 switches arrangement with bidirectional switching has been considered which is simulated using closed loop control.

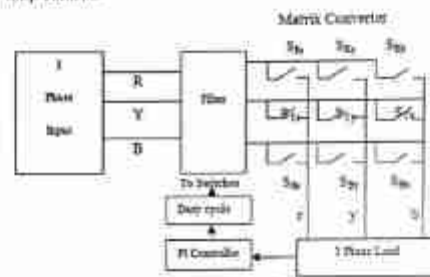


Fig. 1 Closed loop control scheme of 3 phase to 3 phase matrix converter

As shown in fig. 1 the matrix converter is considered with a closed loop system consisting of PI controller. The PI controller has been implemented with mathematical modeling which includes modeling of power circuit, switching algorithm, load and controller. Thus by adjusting the duty ratio with the use of PI controller the switching performance of matrix converter has been improved in case of RL load. As stated in paper the simulation results are obtained for a reference current of 7 ampere and amplitude of 325 volt with time limit 0.1 msec. Based on the parameters selected the output is realized with three phase passive RL load considering $R = 10 \Omega$ and $L = 20mH$. The output obtained is fed back to matrix converter through PI controller to achieve real time control. The following waveforms are obtained for various parameters such as duty cycle, output voltage, output current for each phase as well as total THD has also been obtained. The waveforms for duty cycle of per phase has been shown in fig.2 and the output current and voltage per phase as shown in fig.3(a)(b).

Off-Line and On-Line Handwritten Character Recognition

A survey for Indic Script

Burendra Ramteke¹ Dr.A.A.Gurjar² Dr.D.S.Deshmukh³

¹ Research Student SSBT's College of Engineering & Technology, Bambhori Jalgaon (M.S.) INDIA

² Professor, EATe Engg. Dept, Sipra College of Engineering & Technology, Amravati (M.S.) INDIA

Abstract- Character Recognition (CR) has been extensively studied in the last half century and progressed to a level sufficient to produce technology driven applications. Now, the rapidly growing computational power enables the implementation of the present CR methodologies and also creates an increasing demand on many emerging application domains, which require more advanced methodologies. In this paper an overview of the present research work related to offline and online handwritten character of the various Indian scripts is presented. The problem of character recognition in the India is promising and challenging task as it is multilingual and multi script country and uses 18 scripts. Hence the attempt is made to present current research status of the problem, various methodologies available for feature extraction and classification for design of optical character recognition system.

1. Introduction:

Machine simulation of human functions has been a very challenging research field since the advent of digital computers. In some areas, which require certain amount of intelligence, such as number crunching or chess playing, tremendous improvements are achieved. On the other hand, humans still outperform even the most powerful computers in the relatively routine functions such as vision. Machine simulation of human reading is one of these areas, which has been the subject of intensive research for the last three decades, yet it is still far from the final frontier.

In the present scenario more importance is given for the "paperless office" there by more and more communication

and storage of documents is performed digitally. Documents and files that were once stored physically on paper are now being converted into electronic form in order to facilitate quicker addition, searches, and modifications, as well as to prolong the life of such records. Because of this, there is a great demand for software, which automatically extracts, analyze, recognize and store information from physical documents for later retrieval. One of the important steps of document processing is Textual processing through Optical character recognizer (OCR).

Optical Character Recognition (OCR) is a branch of pattern recognition and computer vision. OCR has been extensively researched for more than four decades. With the advent of digital computers, many researchers and engineers have been engaged in this important area. OCR is broadly defined as the process of recognition either printed or handwritten text from document images and converting into electronic form. It is not only a new developing area due to many potential applications such as bank check processing, postal mail sorting, automatic reading of tax forms, and reading various handwritten and printed text and graphics documents. [24]

Handwritten document can be converted into digital form by scanning the handwritten paper called offline and by writing with the help of special pen on digital board called online character recognition. In case of offline complete document is available as image where as in case of online, the two dimensional coordinate of successive points of written on digital board are stored in order as the function of time. Thus order of the strokes made by the writer readily available for further analysis. [23] The presentation of input

Combined Effect of Pour Point Depressants and Magnetic Field on the Viscosity and Pour Point of Crude Oil

Anand B. Kulkarni
Maharaja Institute of Technology, Pune, India

Kishor S. Yant
SBT's College of Engg. & Tech., Jalgaon, India

Abstract: Pour point depressants (PPDs) are widely used for mitigating wax deposition problems. But they are costly and environmentally hazardous. Another method which has attracted the attention is the magnetic field (MF) conditioning method. Though this method is environmentally friendly and economical, the results obtained have found to be controversial. The viscosity and pour point may increase or decrease. This has been attributed to number of reasons, the main reason being the specificity of crude oil and its interaction with the magnetic field. Hence an attempt has been made to investigate the combined effect of PPDs and MF for better viscosity and pour point reduction. It has been found that there is no substantial enhancement in the viscosity and pour point reduction with the combination. Hence pure PPD method dominates wax inhibition methods at of now.

Keywords: Crude Oil, Pour Point Depressants, Magnetic Field, Wax Deposition, Viscosity

1. INTRODUCTION

Transportation of crude oil by pipe lines is a difficult job owing to the viscous nature of the crude due to wax formation. If proper measures are not taken it may lead to tremendous economic loss as a result of decrease in production. The most commonly used methods are mechanical, chemical and heating methods. Chemical methods are more preferred due to the ease of implementation and the results obtained. But their use is environmentally hazardous. Also the cost of these proprietary chemicals is high owing to the research efforts put in them. This method is the most widely studied method and new PPDs keep on pouring into the flow assurance market frequently.

II. LITERATURE

A. Pour Point Depressants

A pour point depressant can be linear polymer or cross polymer with pendant hydrocarbon chain group. The different wax inhibitors that have been used traditionally include Ethylene Vinyl Acetate (EVA) and its copolymers, Maleic anhydride and methyl methacrylates [1][2][3][4]. Various wax crystal inhibitors have been synthesized by number of workers. Wei [5] has elaborately discussed recent advances in wax inhibition chemicals. Following are few of the synthesized polymers acting as pour point depressants. Copolymer of Maleic anhydride having polar functional group in their structure by Thakurach and Bharanbe [6], decyl acrylate and lauryl acrylate by Ghosh and Das [7], reactive PPDs with anhydride group by Liu et al [8], Carbazole dihydrochloride by Williams et al [9], hexatrihydrochloride methoxide by Shazina et al [10], Octyl, decyl and dodecyl 3-methylimidazolium Dodecylsulfonium Chloride by Subramanian et al [11], Tris(hexamethylene) (THA) by Popoola et al and Talwar et al [12], [13], maleic anhydride- α -methylstyrene copolymer and its derivatives with acetanilide (MAC), phenyl (AMAC) or naphthalene (NMAC) pendant by Xu et al [14], phthalimide and succinimide copolymers of vinyl acetate, styrene and methyl by Al-Sabagh et al [15], modified octadecene-co-maleic anhydride copolymers by El-Ghannay et al [16] and poly (tetradecyl acrylate) (PTAA)/oxo nanocomposite PPD by Yao et al [17].

The mechanism of wax inhibition has been explained by different theories. These are the Incorporation- Perturbation theory, nucleation Reorganization theory and the adsorption on pipe wall theory [18]. The nucleation theory suggests that the wax inhibitors act as nucleating agents. They aid in the formation of smaller wax crystals. They also adsorb on the surface of the wax nuclei leading to the formation of a defective wax surface. This weakens the interaction with the surrounding crystals [19]. The Incorporation- Perturbation theory states that when the wax crystallization process begins at a temperature lower than wax appearance temperature (WAT), the wax inhibitors incorporate on the growing surface of the wax crystals in the pipe wall theory, amphiphilic surfaces are created on the pipe walls by the inhibitors which prevent the adsorption on wax crystals. [20]

This has been supported by Behbahani [21] who sees that flow improvers co-crystallize with wax thereby introducing a fault in the growing wax crystal. Chen et al [22] suggest that the structure of wax partly transformed from hexagonal to orthorhombic. Another theory by Banks et al claims that addition of PPD causes the critical volume fraction ϕ^* to increase thus decreasing the pour point which is correlated to the axial ratio h/d . Thus effective PPDs work by changing the axial ratio of wax crystals that are precipitated [23]. Naryanayana et al [24] found that flow improvers modify the aliphatic portion of resin, wax and asphaltines and do not interact with the polar group in these fractions.

Optimization of ZIF-8 Filler loading in Mixed Matrix Membrane for Gas Separation by Permeation Models

Abhinav R. M.¹

*Department of Chemical Engineering,
NIFT, Nashik, affiliated
to the N.P.S.U. Pune,
(M.S), India - 422001*

K. N. Wan²

*Department of Chemical Engineering,
N.S.R. Co., Ltd.,
Belgaon, affiliated to the N.S.U.,
Belgaon (M.S), India - 431001*

V. N. Pathil

*Department of Chemical Engineering,
G.E.C. Jalgaon, affiliated to
the N.A.U., Jalgaon (M.S),
India - 423001*

Abstract— Performance of Mixed matrix membranes (MMM) depends upon the filler loading to improve the transport properties of polymeric matrix blends for gases. The objective of this study is to optimize the effect of synthesized filler loading (ZIF-8) on the relative permeability of prepared mixed matrix membranes and validate the various theoretical models at 8 bar operating pressure.

Membranes were prepared by using pure Poly(ethylene terephthalate)/Poly(ethylene glycol) blend and PEBA/PE/ZIF-8 based asymmetric mixed matrix membranes at loading of ZIF-8 filler from 0 to 30% using solvent evaporation method. The characterization spectra's FTIR and TGA of prepared membranes indicate that the blends were miscible and compatible. The effect of ZIF-8 loading on gas permeability and selectivity for prepared mixed matrix membrane for pure gas mixture (O₂ and N₂) was further analyzed by using gas chromatography.

Comparative investigation of experimental results with theoretical by selected theoretical models for relative permeability (P_{rel}) at 8 bar pressure for different values of volume fraction (V_f), found in good agreement at optimum loading of 10 to 20% of ZIF-8. The overall observations and findings confirmed that, the PEBA/PE blends were miscible and provide good compatibility with ZIF-8 particles at this loadings, have great potential for applications in gas and vapour separation.

Keywords— Mixed matrix membranes (MMM), Zeolite Imidazolate Framework-8, Permeability, Permeation models, Polymer blend.

I. INTRODUCTION

Mixed matrix membrane consists of combination of two or more chemically different materials, the continuous phase is a matrix and the other constituent is the reinforcement, in the form of molecular sieve particles added into the matrix to improve or alter the matrix properties [1]. It has inherent porous and inorganic material adsorption and slowing properties, the porous ability and flexibility of polymer, improvement in resistance to heat, corrosion and chemical degradation.

Meta-organic frameworks (MOFs) [2] and its subclass Zeolite Imidazolate Framework (ZIF-8) [3] are an promising class of porous materials comprising metal centers connected by various organic linkers to create one, two and three dimensional porous structure with tunable pore volumes, surface areas, and abundant topology. As a combination network, MOFs are mechanically less stiff and brittle compared to zeolite. It has found many applications in methane gas separation, in selective gas adsorption, hydrogen storage, catalysis and sensing [4].

To fabricate a hybrid, material selection for matrix and slowing material are the key factors in order to have a membrane with good chemical strength and excellent separation performance. The objective of this study is to optimize the effect of synthesized filler loading (ZIF-8) on the relative permeability of prepared mixed matrix membranes and validate the various theoretical models at 8 bar operating pressure.

II. LITERATURE REVIEW

The critical literature review proved that, the gas separation by polymeric membrane started in early of 1970, but by mixed matrix membranes [5]. It has been studied extensively since 1990. Since then, MMM has undergone continuous development to achieve to its current state. In the last 20 years, this MMM technology was progressed to early advanced stage by utilization of different inorganic molecular sieve materials used as main fillers.

Blending between the inorganic fillers [6,7] like carbon nano tubes, zeolite, metal oxides, silica and silica nano particles, SiO₂ with glassy and rubbery polymers to prepare a mixed matrix or hybrid membrane [8,9,10] has been worked out successfully.

This convenient material combination for industrial gas separations, has become an important research topic in recent years was focused in this work. A number of glassy and rubbery polymers have been used to fabricate the gas separation membranes [11]. However despite of several advantages, the separation performance of polymeric membranes is limited by upper bound trade off between selectivity and permeability discovered by Robeson in 1991 [12]. Since then researchers tried to enhance the performance of membranes i.e. permeability and selectivity by different techniques including mixed matrix approach, chemical cross-linking, composite and hybrid membranes and polymer blending [13].

It was observed that, even though numerous advantages of inorganic material, membrane performance is still hindered by expectations, due to membrane defects, cracks, and voids, retention of surface area [7,14], uniform dispersion and processing problems [15]. Major technical barrier is the preparation of well dispersed and wetted additives at high loading. There is prime importance to study the material selection of organic and inorganic phases, and its preparation techniques [16]. The study shows

Acoustic cavitation Coupled with Advance Oxidation Process for Treatment of Dairy Industry Wastewater

Yogendra D. Thakare¹, Kishor S. Wani²

¹Research Scholar, SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India

²Professor and Principal, SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India

ABSTRACT: - This paper investigates the reduction of COD of dairy industry waste water by individual and combined process of acoustic cavitation, H₂O₂, Fenton and Photo Fenton process. All experiments were performed on a laboratory scale setup. The effect various parameters such as sonication power, duty cycle, initial pH, hydrogen peroxide concentrations and Fenton reagents on the reduction of COD of dairy waste water have been assessed. Effective system conditions were found to be sonication power of 800W, duty cycle of 60 %, pH of 3, 200 µL of hydrogen peroxide concentration and 78 mg/L of Fenton reagents. The results show that the % of COD reduction of dairy industry waste water after 180 min reaction time follows the decreasing order: Acoustic Cavitation + Photo Fenton Process (88.78 %) > Acoustic Cavitation + Fenton Process (66.22 %) > Acoustic Cavitation + H₂O₂ (40.02 %) > Acoustic Cavitation (13.53 %).

KEYWORDS:- Dairy Industry Waste Water, Acoustic Cavitation, Acoustic Cavitation + H₂O₂, Acoustic Cavitation + Fenton Process, Acoustic Cavitation + Photo Fenton Process, Chemical Oxygen Demand (COD).

1. INTRODUCTION

Among the food industries, the dairy industry is the most polluting in volume in regards to its large water consumption. Water is used throughout all steps of the dairy industry including cleaning, sanitization, heating, cooling and floor washing and naturally the requirement of water is massive [1]. In the dairy industry, starting, equilibrating, interrupting and stopping any of the processing units generate large volumes of effluent [2]. Dairy wastewater generally does not contain conventional toxic chemicals like those listed under EPA's Toxic Release Inventory. However, it has high concentration of dissolved organic components like fats, oils and grease, nutrients such as ammonia or minerals and phosphates and therefore require proper attention before disposal[3].

In Advance Oxidation Processes (AOPs) oxidation is based on intermediate reactions in which the hydroxyl radical (HO^{*}) is present. These processes are able to degrade a large number of organic compounds by reduction-oxidation and free-radical reactions to carbon dioxide (CO₂) and water (H₂O). Advanced oxidation

A Review on Treatment of Sewage Water & Biogas Purification by Algae

Dr. S. A. Thakur¹, Miss. Payal Bhanthli², Mr. V.P. Sangore³, Mr. Kishorep Singh⁴

¹Assistant Professor, Department of Chemical Engineering, SSBT's College of Engineering and Technology, Bambhori, Jalgaon

²Ph.D. Scholar Department of Chemical Engineering, Laxminarayana Institute of Technology, ICMNU Nagpur

³M.Sc. Chemistry, Dr. C. V. Raman University, Bilaspur, Chhattisgarh

Abstract

Biogas is a developing alternative energy source engendered from the anaerobic digestion of organic matter by bacteria. It is composed primarily of methane and carbon dioxide (CO₂) with trace amounts of other toxic compounds, such as hydrogen sulfide (H₂S). The presence of CO₂ decreases the energy yield from the combustion of biogas. Past studies have utilized extravagant and environmentally deleterious chemicals to purify biogas. This study involves the construction of a biogas purification system that utilizes microalgae to metabolize and abstract impurities from the system as well as gives treatment to sewage waste water. This method has the distinct advantage of being renewable due to the self-propagation of the microalgae. The microalgae are additionally engendering hydrocarbon products that can be utilized as a bio-fuel.

Introduction

Industrial energy demands are rapidly outpacing the available fossil fuel sources, and the desideratum for alternative energy sources is widely appreciated. Experts have proposed biogas as one of these incipient sources. Biogas is a combustible confluence of gases engendered from the anaerobic digestion of organic material by a community of microbes. Biogas is naturally engendered in astronomically immense quantities by landfills and waste sewage waste water treatment plants. Because of the wide availability and renewable nature of the organic materials and microbes required for biogas synthesis, biogas is a potentially efficacious and sustainable energy source.

Biogas: Biogas typically consists of 45-75% methane, 25-55% carbon dioxide (CO₂), and other compounds like hydrogen sulfide (H₂S) and ammonia (NH₃), ranging from hundreds to a thousand components per million. The methane in biogas is a valuable source of energy, while other components are impurities that pose major impediments to the commercial utilization of biogas. CO₂ has no energy yield through combustion and greatly reduces the energy yield per volume of biogas due to its high concentration. H₂S is toxic and highly corrosive, often damaging machinery used to convey and engender energy from biogas. Current methods of biogas purification involve chemical or mechanical processes, including chemical scrubbing, chemical adsorption, filters, and membranes. These are symptomatic and often environmentally hazardous due to the nature of the chemicals utilized. Quantities associated with cost and sustainability averts biogas from becoming a competitive alternative energy source. Biological methods of purifying biogas subsist but are not utilized on an industrial scale.

Separation of Azeotropic Solution of Ethyl Acetate-Ethanol by Cobalt Nitrate

Rudhanshi R. Deshmukh¹, Dr. V. B. Dhwane², Dr. S. A. Thakur³, V. P. Sangate⁴

¹Department of Chemical Engineering, Shriam Sahebji Bhausaheb Trivedi College of Engineering and Technology, North Maharashtra University, Jalgaon - 426001, India

²Corresponding Author: Rudhanshi R. Deshmukh, Assistant Professor, SSBT COET, NMMU, Jalgaon.

Abstract: Separation of azeotropic solution by simple distillation requires third column to remove the added entrainer, but it is not cost effective and energy effective process. Hence to overcome this difficulty, a salt effect on vapour liquid equilibrium (VLE) relationship is provided as a potential technique of extractive distillation for azeotropic systems. In the present study, the comparative effect of zinc chloride and cobalt nitrate on ethyl acetate-ethanol system at atmospheric pressure of 760mmHg has been studied. Moreover, linear relationship between salt concentration and relative volatilities has been reported.

Keywords: Vapour Liquid Equilibrium Salt Effect Ethyl Acetate-Ethanol Azeotropic System.

I. INTRODUCTION

Concentrated ethanol of various grades is becoming an increasingly important as a fuel for vehicles and also used in adhesives, cosmetics, explosives, detergents, industrial coatings, ink, vinegar, windshield washer fluid, heat transfer fluid and in certain process industries. Ethyl acetate is a solvent used in a wide range of applications, including printing inks, varnishes and varnish solvents and in the production of acetates, plastics and rubber and in the food industry in the production of synthetic flavoring and in the pharmaceutical industries as an extraction solvent in the production of pharmaceuticals [1]. A mixture of ethanol and ethyl acetate is produced during the separation of Fischer-Tropsch oxygenated products into different components. The azeotrope of ethanol and ethyl acetate is difficult to separate by distillation because the azeotrope boils within a narrow range and because of the existence of binary azeotrope of these compounds [2]. In the azeotropic distillation, third liquid component is added to alter the relative volatilities. As we use solid nonvolatile salt it would not present in distillate product. Change in relative volatility by adding nonvolatile salt depends upon solubility of salt in liquid. Kulkarni [3][4] [5] in 1981 reported the results of salt effect on vapour liquid equilibrium (VLE). His observed vapour pressures were proportional to salt concentration. Miller [6] in 1897 reported that the amount of salt effect would depend on difference in solubility of salt. Wright and Butler proved the same results for salt solution [7][8]. Samudhar & Manoj compares the difference between distillation with salt and without salt [9]. Puri [10] proposed a semi theoretical model to predict salt effect. J. Probst & G. Keller [11] also studied the effect of calcium chloride and lithium chloride on binary acetone-methanol system. Ota, K. Yokoyama and Nakamura were discussed the isobaric liquid equilibrium for six different salt [12]. The Motoyoshi, Hirata studied the salt effect on Vapour Liquid Equilibrium of Acetic Ester-Alcohol with Potassium Acetate and Zinc Chloride [13].

Palyan and Yujan reported the four isobaric vapour liquid equilibrium for binary system [14]. Rathod Naik studied ethyl acetate-ethanol system for lithium chloride, lithium bromide, lithium iodide salt [15]. Recently, Radakrishnan studied for the same system using inorganic salt of chloride and nitrate [16]. In the present study, the effects of cobalt nitrate and zinc chloride on ethyl acetate-ethanol azeotropic system at 760mmHg were studied in detail.

II. EXPERIMENTAL

A. Details of VLE apparatus

Fermentation Kinetics and Ethanol Production from Different Corn Grains Varieties

Abhishek B. Gawande

Research Student, SBT's, COET, Bambhori, Jalgaon and
Assistant Professor, Department of Food Technology,
L.T.E., RTMNU, Nagpur, MS, India

Dr. V. D. Patil

Professor and Head, Department of Biotechnology,
SBT's, COET, Bambhori, Jalgaon (MS),

Abstract— Study of fermentation kinetics in ethanol production from damaged corn grains is crucial aspect for economical yield enhancement. Two samples of corn flour, namely control and damaged, with different carbohydrates and nitrogen content, were used as substrates. Samples were liquefied and saccharified using commercial α -amylase and glucoamylase, for production of fermentable sugars. Amount of fermentable sugar obtained after hydrolysis of damaged and control corn grains were 93 g/L and 123 g/L, respectively. Enzyme hydrolysates were then fermented to produce ethanol in batch mode. Ethanol was consumed principally in both cases, control and damaged; ethanol production was considerably higher in control (86 g/L), compared to damaged (45 g/L). Submerged fermentation of damaged corn grains flour represented about 80 % of total ethanol production, when five corn grains flour was used as substrate. In damaged corn flour ethanol productivity and yield was 1.12 g/L/h and 0.18 g/g flour, respectively. In control corn flour ethanol productivity and yield was 1.16 g/L/h and 0.22 g/g flour. Maximum sugar consumption rate (R_{max}) for damaged and control corn were 4.23 g/L/h² and 4.5 g/L/h², respectively. Maximum product formation rate for damaged and control corn (R_p) were 1.89 g/L/h² and 1.85g/L/h², respectively. Fermentation efficiency of damaged and control corn grains were 91.8% and 91.7%.

Keywords— Fermentation kinetics, Ethanol production, Damaged corn grains

I. INTRODUCTION

Bio-fuels are being actively encouraged in the transportation sector. Research work is focused on the development of renewable resources, sustainable development, green energy, eco-friendly process, etc., in the transportation sector. Improving the use of bio-fuels for energy generation purposes is of particular interest nowadays because they allow mitigation of greenhouse gases, provide means of energy independence and may even offer new employment possibilities. Bio-ethanol is by far the largest widely used bio-fuel for transportation worldwide. Ethanol can be produced from various sugary substrates such as molasses, starch, cereals like corn, wheat and potato (Mairella *et al.*, 1981) and cellulosic materials (Dashpande *et al.*, 1985), due to increasing demand for ethanol which is an alternative energy source (Lydell *et al.*, 1991). Sweet sorghum has the potential of becoming a useful energy crop (Kargi *et al.*, 1983). However, fresh starchy materials are required for higher consumption. A large quantity of different grains is spoiled every year in India because of unfavorable climatic conditions and inadequate transport and storage facilities. Damaged grains are those which are unfit for human consumption. The damage includes blackened, broken, cracked, attacked by fungi, insect damaged, partially rotted by being damp, dirty and foul smell, etc. Ethanol production from damaged cereals grains is feasible (Gawande and Patil 2014). Damaged sorghum grains are non-edible could be utilized optimally for ethanol production (Gawande and Patil 2016). Non-edible damaged corn grains were utilized for ethanol production in co-culture at 25% substrate concentration using co-culture of *Aspergillus niger* NCIM 1248 and *Saccharomyces cerevisiae* MTCC 130 (Gawande and Patil 2017). In this research, two varieties of corn healthy (blue for control) and, damaged/blackened corn were used as fermentation substrates. Both of them were evaluated to study kinetics of the sugar consumption and ethanol production during fermentation, using a 5-L fermenter.

II. MATERIALS AND METHODS

A. SUBSTRATE

Control grains used were commercial yellow dent maize obtained from a local market. Fagger was used as a control for experiments. These grains were purposely blackened by sprinkling water on them and keeping them in damp conditions spread on a clean jute bag, covered with damp cotton. Damaged grains samples were cleaned by removing debris and other contaminants by washing and drying

Production of Metal Nanoparticles By Microbial Fermentation

¹Jayant P. Parpallwar, ²Dr. I.D. Patil, ³Gaurav D. Khodape
¹Assistant Professor, ²Professor & Head of the Department, ³Assistant Professor
Department of Biotechnology,
SSBT's College of Engineering and Technology
Bambhori, Jalgaon 425001

ABSTRACT: The development of rapid and reliable processes for the synthesis of nanosized materials is of great importance in the field of nanotechnology. In this paper, we describe a novel synthesis approach which is rapid, simple and "green" for the synthesis of metallic nanostructures of noble metals such as silver (Ag), by using culture supernatant of *Bacillus subtilis*, *Aspergillus flavus*, and *Fusarium oxysporum*. We have worked with different strains and have derived important conclusions about the most efficient, rapid and reliable strain for Nanoparticle synthesis. The nanoparticles were examined using UV-Visible Spectroscopy, and Transmission Electron Microscopy (TEM) analyses. The formation of nanoparticles by this method is extremely rapid, requires no toxic chemicals and the nanoparticles are stable for several months. The main conclusion is that the bio-reduction method to produce nanoparticles is a good alternative to the electrochemical methods.

KEYWORDS: Silver Nanoparticles, Culture supernatant, UV-Spectroscopy and Bioreduction

Introduction:

Nanotechnology, shortened to "**nanotech**", is the study of the controlling of matter on an atomic and molecular scale. Generally nanotechnology deals with structures sized between 1 to 100 nanometer in at least one dimension, and involve developing materials or devices within that size. Nanoparticles were used by artisans as far back as the 9th century in Mesopotamia for generating a glittering effect on the surface of pots.^[1] The development of reliable processes for the synthesis of silver nanomaterials is an important aspect of nanotechnology today.

Nanoparticles are viewed as the fundamental building blocks of nanotechnology.

Nanobiotechnology is that branch of one, which deals with the study and application of biological and biochemical activities from elements of nature to fabricate new devices like biosensors points for preparing many nanostructured materials and devices. Their synthesis is an important component of the rapidly growing research efforts in nanoscience and nanoengineering. Nanoparticles from a wide range of materials can be prepared by a number of methods. Precursors from liquids, solid or gas phase are used for synthesis and assembly of nanoparticles or nanomaterials. Metal nanoparticles are typically produced on a small laboratory scale using methods such as chemical vapour deposition, irradiation or chemical reduction of metal salts. However, there is a growing need to prepare environmentally friendly nanoparticles that do not produce toxic wastes in their process synthesis protocol. To achieve this, scientists in the field of synthesis and assembly of nanoparticles are inclined to shift to benign synthesis processes, which happen to be mostly of a biological nature. Biological entities like microorganisms and living cells possess operating parts at the nanoscale level and may perform a number of jobs ranging from generation of energy to extraction of targeted materials at a very high efficiency.

Here, we are using novel methods for the synthesis of different metal nanoparticles by using various biological entities (micro-organism).

MOBILITY in WIRELESS NETWORK with NAMED DATA NETWORKING

Pragati A. Patil

Ashish T. Bhole

Department Of Computer Engineering,
SSBT's College Of Engineering And Technology,
North Maharashtra University, Jalgaon, Maharashtra, India.

Abstract – Internet was designed as a point-to-point communication model between two hosts which requires an IP address for the connection with every networking interface they used. The connection does not guarantee the data forwarding when mobile user changes its location and there needs to repeatedly acquire an IP address. To address these problems some solutions were proposed are Mobile IP and Host Identification Protocol (HIP) but they do not support content mobility issues and the data forwarding while nodes in the network are moving. Moreover it is the challenging task with IP based mobility environment. Unless the change in IP based environment, mobile user will continue to have trouble for the connection with multiple network interfaces, increasing network overhead and less content retrieval. However, this leads to find an efficient alternative architecture in internet which is Named data Networking (NDN). NDN supports data access by Content Names (CN) instead of IP. NDN data packets carry unique content names instead of source and destination address. The use of unique content names for data forwarding allows mobile users to have better data access as there is no need to repeatedly acquire an IP address and may continue with data forwarding which reduces network overhead. Therefore, the proposed work is intended to work with handling of mobility with Named data Networking.

Keywords – Named Data Networking, Host Identification Protocol, Content Names, IP, Content Mobility.

I. INTRODUCTION

Internet was designed more than 30 years ago as a packet data network where users and data servers with specific IP addresses interacting over a pre-established communication channel. This model of client-server data communication has developed now a days into a peer-to-peer mode of data sharing. The applications like, YouTube, Bit Torrent, social networks have founded the idea of user generated contents. Modern users care only for specific data items irrespective of their sources of data. So, the idea of identifying servers hosting a particular content by its IP address is losing its importance. Moreover, want of IP addresses is a challenging issue to the Internet community since long time. The use of Information-centric networking platform is needed where data hosts are of less importance is, and Named Data Networking (NDN) has been proposed to address the issues related to previous IP based mobility network. NDN allows users to send a data request without having any knowledge about the hosting entity. NDN can more efficiently handle user mobility, security issues than the current Internet.

The basic design principles of NDN are based on the Internet. NDN can directly use inter-domain routing policies and IP services like, Domain Name Service (DNS), IP routing protocols like, OSPF and BGP can be inherited to NDN with slight modifications. However, NDN offers enhanced features. It uses data packets with content names (CN) instead of source and destination addresses. The use of unique content names for communication allows routers to keep track of packets states, which supports numerous functions unlike the IP routers. The data packets are self-contained and independent from their location where they are retrieved and where they can be forwarded. These features allow in-network caching of contents for saving and fulfilling, future requests and supports mobility. In NDN, all data packets are signed by its producer who sends data packet and verified by the consumer to retrieve the data, unlike IP, NDN routers support multi-path forwarding, i.e., they can forward a user request to multiple interfaces at the same time. Moreover, the use of content name for communication removes the need of continuously acquire an IP address. NDN and Internet share the same layered hierarchy architecture with functional differences between corresponding layers. The OSI communication model has only Internet Protocol (IP) in the Network layer. However, it is difficult to add new functionalities to the IP and to modify the existing ones. As a future Internet paradigm, NDN's network layer must support security, resiliency to detect and recover from packet delivery performance, and efficiency to support multi-path forwarding and in-network caching for efficient data dissemination.

Internet was designed as a point-to-point communication between two end hosts which allowed the users to fetch data from servers. Though, the Internet has shown great resilience over the years, recently, the changes in the nature of applications, user requirements, and the usage patterns have significantly strained the traditional network. Modern users care only for specific data items irrespective of their data sources. So, the idea of using IP addresses to identify servers hosting a particular content is losing importance because it was not designed to support the newly evolving Information Centric Networking. There are the inherent limitations of the Internet with respect to support for content dissemination, user mobility, network security. Therefore, there is need of a new Internet paradigm which can address the drawbacks of the current Internet and point out the challenges with simple and efficient solutions and motivates to proposed the alternative architecture NDN over the IP based network.

WORD SENSE DISAMBIGUATION FOR DEVNAGARI LANGUAGE

Chitra Liladhar Mahajan¹Sandip S. Patil¹

*Department Of Computer Engineering,
SSBT's College Of Engineering And Technology, North Maharashtra University,
Jalgaon, Maharashtra, India*

Abstract - In natural language processing and understanding, semantic processing is an important task. In semantic processing, some words have multiple senses (meanings) which are unrelated with each other. These multiple senses possess critical problems to linguists and they create ambiguity in sentence. Word sense disambiguation accepted this challenge. It is one of the central challenges in NLP and occurs in all the languages. Human can easily disambiguate the words but machine can not. WSD has numerous applications in machine translation, information retrieval, question-answering etc. The ambiguity can be lexical and semantic. In NLP, Word Sense Disambiguation (WSD) is the task of perfectly assigning the acceptable, correct sense (meaning) to the words having multiple senses in the given natural language text. WSD is categorized in three types w.r. Knowledge base, machine learning and Hybrid approach. The work carried out on Marathi language is limited. In the proposed work, we are resolving the ambiguity in Marathi words based on their senses and their context hybrid approach. Hybrid approach consist of modified Lask with support Vector Machine.

Index Terms: WSD, Sense annotated corpus, Ambiguity, Context, polysemous word, Context window, SVM, Wordnet

I. INTRODUCTION

Today is the era of information technology. Everyone is using web to share and find information. But, the information is present in natural languages. As know that natural languages are ambiguous i.e single word denotes the different meaning. Ambiguity is something which can be understood in two or more ways. So, to use information technology efficiently need to remove ambiguity from the sentences with the help of tool called Word Sense Disambiguation. Word Sense Disambiguation is one of the task of identifying correct meaning of polysemous word given in context.

For example:

1. व्यक्ति को संजय कहा।
2. व्यक्ति संजय कहा।

In sentence 1, the word व्यक्ति indicates: name of the "Person" and in sentence 2, it indicates "Sky" sense.

Ambiguity is one of the problems which have been a great challenge for computational linguists. Something is ambiguous when it can be understood in multiple possible ways or when it has more than one meaning. Sometimes two completely different words are spelled the same. Word Sense Ambiguity makes it tough for Computers automatically carry out Natural Language applications like machine translation, information retrieval, question-answering etc. Every natural language suffers from sense ambiguity problem. Word sense disambiguation (WSD) is the problem of determining in which sense a word is used in a given context. Ambiguity is something which can be understood in two or more ways. So, to use information technology efficiently need to remove ambiguity from the sentences with the help of tool called Word Sense Disambiguation (WSD). The significant work are exists on Word Sense Disambiguation for many different languages using various methods. But the work carried out on Marathi language is limited. Keeping this reality in mind, in proposed work the worked will be done for Marathi language using Hybrid approach.

In the understanding of natural language, processing an ambiguous word is an major challenge. Word Sense Disambiguation (WSD) is having the ability to identify the correct sense of the ambiguous word used in the sentence. The problem of identification of specific sense of given word seems to be easy for a human being by using common sense, but for machines, it is difficult task as it requires processing of huge amount of unstructured information present in natural languages to identify the correct meaning. In Literature, WSD is categorized in three types w.r. Knowledge base, supervised and unsupervised. Knowledge based WSD requires overlapped approach, supervised requires tagged corpus and unsupervised gives less accuracy. However in literature, Marathi WSD has not taken under consideration. The proposed WSD approach, disambiguates the Marathi words by using hybrid approach, which resolves the ambiguity from the words based on their senses and their context in the Marathi sentence. In hybrid approach for marathi ambiguous words, considered the two words previous and two words after ambiguous words. The system works on only single sentence at present and identify the ambiguity.

NLP Based Clinical Data Analysis for Assessing Readmissions of Patients with COPD

Priyanka V. Medhe¹Dinesh D. Puri²

Department of Computer Science and Engineering,
SSBT's College of Engineering and Technology,
North Maharashtra University, Jalgaon

Abstract— Natural language processing is a computer science field, which focuses on interactions between computers and human (natural) languages. The human languages are ambiguous unlike computer languages, which make its analysis and processing difficult. Most of the data present these days is in unstructured form such as Accident reports, Patient discharge summary, Criminal records etc, which makes it hard for computers to understand for further use and analysis. This unstructured text needs to be converted into structured form by clearly defining the sentence boundaries, word boundaries and context dependent character boundaries for further analysis. With the passage of recent federal legislation many medical institutions are now responsible for reaching target hospital readmission rates. Chronic diseases account for many hospital readmissions and Chronic Obstructive Pulmonary Disease has been recently added to the list of diseases for which the United States government penalizes hospitals incurring excessive readmissions. Though there have been efforts to statistically predict those most in danger of readmission, few have focused primarily on unstructured clinical notes. Here a framework is created for analyzing clinical notes and predicting readmissions of patients. Key steps include many algorithms within the field of data mining and machine learning, as a framework for component selection is created to select the best components. NLP is applied followed by some of processing techniques like, tokenization, stop words removal, stemming, pruning, semantic analysis, POS Tagger etc.

Keywords— Chronic Obstructive Pulmonary Disease, Natural Language Processing, Readmissions, Clinical Notes Pre-processing, Prediction Modelling

1. INTRODUCTION

The Institute of Medicine's report on medical errors demonstrates that adverse events in hospitalized patients are common [1]. A study of 30,121 randomly selected records of hospitalized patients admitted to acute-care hospitals in New York State in 1984 [2] showed that 3.7% had adverse events; of those, 2.6% caused permanent disability, 13.6% caused death, and 28% were negligent. A second study of 15,000 discharges from hospitals in Utah and Colorado in 1992 [3] showed that 2.9% had adverse events; of those, 2.2% caused permanent disability, 6.6% caused death, and 27–32% were negligent. Several studies have attempted to clarify the epidemiology of adverse events [4, 5].

The American Recovery and Reinvestment Act (ARRA) of 2009 [1] emphasized the adoption of health information technology through the Health Information Technology for Economic and Clinical Health Act (HITECH Act) [2]. Two prime components related to this act are introduction of penalties for hospitals for patient readmission within 30, 60 and 90 day period for specific diagnoses; and introduction of the concept of Clinical Decision Support Systems (CDSS) in Electronic Health Records through "Meaningful Use" (MU) compliance [3]. Currently, the MU compliance requires a very basic implementation of rule based decision support systems which could be introduced by an office-practice physician based on the combination of demographics, lab results, medications, allergy, and past medical history.

The HITECH Act stipulates that healthcare providers demonstrate the meaningful use of health IT. As part of this act, CMS identified "hospital readmissions for COPD" as a costly problem that needs to be addressed in the United States as a whole [4]. The scope of the problem is very large and cost data is available through CMS. CMS has started penalizing hospitals for excessive 30-day COPD readmissions. As a result, there is an increased amount of pressure on hospitals to adopt the CDSS to identify the candidates for hospital readmission and avoid such readmissions by a series of efforts, such as closely coordinated transition of care. Unfortunately, it is not possible to provide such an extensive level of care for every patient due to the amount of resources needed, shortage in medical staff, and the expenses involved in such care coordination [4]–[6]. Therefore, it is critical to accurately identify candidates for hospital readmission and then avoid such readmission through the use of resources. Further, since patient-hospitalization represents such a large portion of healthcare expenses, health plans, Accountable Care Organizations (ACO), and Managed Services Organizations (MSO) are also targeting hospital readmission in order to improve their profitability. Though predictive modeling for many diseases has seen a large body of research [7]–[10], COPD predictive modeling remains scarce.

The main motivation for this research is the availability of an enormous amount of data that could effectively aid in medical research. These data are mostly available as free text collected through research applications. Processing of these data will provide information that would aid in the research subject recruitment process. This could be achieved by filtering the criteria from the free text to be used in the database queries. Patient data in hospitals includes a significant amount of unstructured data such as physician notes, discharge summaries, and x-ray radiology reports. Since free text is an important part of patient records, including it in predictive analysis is equally important. Despite the inherent value of the clinical information present in the document, a manual review of free text records is very time-consuming process. Therefore, there is interest in developing a Natural Language Processing (NLP) based approach to extract such information from patient records. However, this is not a simple task due to the ambiguity and variations in language used for describing and evaluating any specific patient condition.

Two Layer Artificial Immune System for Intrusion Detection System

Akshay U. Mahajan

PG Student, Department of Computer Engineering,
SSBT's College Of Engineering and Technology,
Bambhori, Jalgaon [M.S], India.

Nitin Y. Suryawanshi

Assistant Professor, Department of Computer
Engineering, SSBT's College Of Engineering and
Technology, Bambhori, Jalgaon [M.S].

Abstract – Artificial immune system (AIS) is an immune-based adaptive computational intelligence method used for detecting and preventing computer network threats in intrusion detection systems (IDS). Distributed control, self-organising and multi-layered detection these are the special features that make AIS efficient for intrusion detection. AIS generates antibodies (self) capable of recognizing antigens (non-self), which is considered as an anomaly technique. Whenever the formation of antibodies and antigens (rule formation) in AIS is implemented at two levels, they are termed as Two Level Artificial Immune Systems (TLAIS). TLAIS uses two different algorithms for self and non-self formation in both levels. The inherent characteristics of the algorithms used in TLAIS limit the efficiency of the TLAIS like premature convergence and overfitting. The proposed TLAIS aims to use two efficient algorithms in terms of time and memory to avoid such limitations.

Keywords – Artificial Immune System, Intrusion Detection System, Adaptive Computational Intelligence, Rule-formation, Antibodies, Antigens, Biological Immune System.

I. INTRODUCTION

The concept of computer network intrusions and attacks is rapidly evolving with the advent of time and technology. Day by day increasing intrusion actions are becoming a serious threat to security of the systems and networks, as they pose a direct threat to integrity, privacy and availability of resources. To tackle the continuous evolving attacks an efficient IDS should evolve and change rapidly. Thus, the importance of Intrusion Detection System (IDS) is increasing in the realm of network security.

Intrusion Detection (ID) is concerned all about monitoring, estimating and reporting unauthorized events, malicious attempts. A good IDS develops resources and robust data security mechanisms. Various techniques are used for implementing IDSs such as artificial neural Network (ANN), support vector machine (SVM), genetic algorithms (GA), artificial immune systems (AIS) etc. The purpose behind using so many techniques is to find an intelligent defence system with self maintenance, self-learning and adaptability. Depending on nature of monitoring the activities IDS can be classified into three major classes.

- i) Network-based Intrusion Detection System (NIDS), analyse all communication traffic on a particular segment of a network.
- ii) Host-based Intrusion Detection System (HIDS), analyse communication traffic on a particular host.
- iii) Third class is hybrid of NIDS and HIDS, which combines data of the agent, with data from NIDS and HIDS [12], [13].

Different approaches are used to detect and prevent intrusion attempts for computer networks. One of these approaches is the artificial immune system (AIS). Computer network threats can be detected and prevented with the help of AIS which is an adaptive computational intelligence method. AIS is inspired by the biological immune system (BIS) used to solve real-world problems. BIS: In general, living organisms try to protect against pathogens using different mechanisms to repel or kill the invaders. More advanced organisms (vertebrates) have developed an efficient defence mechanism called the immune system. Substances that can stimulate specific responses of the immune system are commonly referred to as antigens. Once the immune system gets stimulated it generates a number of antibodies which respond to the foreign antigens. To be effective the immune system should be able to distinguish between the self (molecule that belongs to or is produced by the body) and non-self (antigens). The immune system can be seen as a multilayer system with defence mechanisms in several layers. Biological immune systems show great resilience in harsh environments and demonstrate the ability to cope with large amounts of sensory data as well as the unpredictability of the natural world.

The immune system is complex but very powerful; it can detect many types of pathogens, even unknowns one, and it has a strong interaction between all the different actors of the immune system it helps to destroy the pathogens. As the immune

Study and Review on Advanced Application Layer Protocols in IoT

Kantil V. Bhargale

Department of Computer Science and engineering
SSBT's College of engineering and technology,
Narsi Mahareskha university, Jalgaon, Maharashtra, India

Nitima P. Patil

Department of Computer Science and engineering
SSBT's College of engineering and technology,
Narsi Mahareskha university, Jalgaon, Maharashtra, India

Abstract— Internet of Things is advance feature in Communication and Information Technologies, providing facilities of global connectivity and management between the sensors, devices, users and information. A typical architecture of IoT consist of sensor nodes which collect the data, Gateway which processes the data and a cloud which stores the data. IoT the devices are resource constrained that is devices run on low power and they have less memory and processing power. Hence, the protocol stack used in IoT communication is consisting of protocols optimized for running on resource constrained devices. In this paper, dealing with the protocol used in the communication between IoT devices. Here, we analyze the advance application layer protocols used in IoT protocol stack and measure the performance. The one of the latest advance protocol introduced in IoT domain is HTTP2.0 which has enormous potential to be become as useful as other legacy protocols used by IoT developers. Hence, analyze the protocol and find out the suitability of this protocol in IoT domain as compared to other existing protocols.

Keywords— IoT, HTTP2.0, MQTT, CoAP, REST, Application Layer Protocols, Performance

INTRODUCTION

The Internet of thing is network of everyday things. IoT is the inter-networking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to collect and exchange data. IoT refers to the networked interconnection of everyday objects which are often equipped with electronic circuits and sensors. In the IoT sense, these objects can refer to a wide variety of small devices embedded with electronics, software, sensors and network connectivity often integrated into larger systems. The application layer protocols available today are geared towards the M2M communication role, namely REST (Representational State Transfer), MQTT (Message Queuing Telemetry Transport), and CoAP (Constrained Application Protocol). XMPP (Extensible Messaging and Presence Protocol), AMQP (Advanced Message Queuing Protocol). IoT systems must be able to cope with potentially unreliable, intermittent, and low bandwidth connections for its access networks. IoT offer connectivity between devices, sensors, and services that use machine to machine communication and cover protocols in that use in IoT. A survey by the Eclipse IoT working group queried IoT developers about the protocols and technologies they are using and planning to use.

- MQTT 52 % developer
- CoAP 21 % developer
- HTTP1.1 61 % developer
- HTTP2.0 19 % developer

IoT architecture has not much clearly defined and have no agreement for a protocol and standard. While developers employ existing technologies to build the IoT, research groups are working on adapting protocols to the IoT in order to optimize communications. IoT domain protocol stack is similar to the web domain except the protocols involved are optimized to run on the resource constrained devices. The major application layer protocols which are used in IoT domain are CoAP, MQTT and REST Full (based on HTTP1.1). Lately, IETF has released more advanced HTTP/2 protocol in 2015 for web domain. From literature of HTTP2.0 it can be seen that this protocol is a good match for IoT for several reasons: Binary and Compact (0 byte header), Header Compression [RFC7541], More efficient format, Support of RUSTful model in major development frameworks. The feasibility study of HTTP2.0 protocol may lead to find out the suitability of this new protocol for IoT scenarios and may help in making it more popular amongst IoT developers.

In order to improve performance of protocols in IoT various protocol performance reconsidered IoT architecture the major devices used are sensor nodes, Gateway to aggregate the data and cloud to store the data. Different application layer protocols are

Study and Review of Hybrid Approach for Privacy Preserving Data Mining

Gunjan S. Bondé

Akash D. Waghmare

PG Student, Department of Computer Engineering,

Assistant Professor, Department of Computer Engineering,

SSBT's College Of Engineering and Technology,

SSBT's College Of Engineering and Technology,

Bambhori, Jalgaon [M.S],India

Bambhori, Jalgaon[M.S],India

Abstract – In today's era of growing technology the data collected by organizations has the requirement to preserve the privacy of the individuals. It needs to maintain privacy of the individuals because users sensitive data is stored online over the centralized repository. The techniques like anonymization, randomization are used to achieve the privacy. But anonymization leads to certain level of information loss while preserving privacy. To overcome this drawback, hybrid approach is used. The proposed system involves combination of two techniques i.e. anatomization and perturbation techniques. The quasi-identifiers like zip code, age, gender of a person does not seem to be very important to protect but these fields when linked with some other attributes can expose the identity or sensitive information of an individual. The hybrid method focuses on the goal of preserving privacy by anatomizing and perturbing the quasi-identifiers in the sensitive data of customers stored on centralized data repository without causing any loss in the information.

Keywords – Anatomization, quasi-identifiers, perturbation.

I. INTRODUCTION

Users sensitive data being collected from private as well as public organizations for various analysis or decision making purposes by data mining. It is necessary to maintain privacy of individual's data. Privacy here means identity of the person not being revealed while unveiling any sort of data or using the data for any research or business purposes. This Privacy Preserving Data Mining is a real challenge these days. The attributes can be divided into following categories:

1. Identifying attributes: These attributes are name, email-id which can explicitly reveals identity of person.
2. Quasi-identifiers attributes: The attributes like age, gender, zip code when linked with some other attributes can easily exposed a person's identity.
3. Sensitive attributes: This includes the data which should not be exposed or published against a person's identity. For e.g. while analyzing the sale of particular product in online shopping, the customer's identity should not be revealed against any product.
4. Non-Sensitive attributes: These are the fields which if disclosed publically do not lead to any problem.

Data hiding tries to remove confidential or private information from the data before its disclosure. In this case, many different methods have been addressed. The randomization method has been traditionally used which has less accuracy and high time complexity so new hybrid approach is used to overcome such problems. Such approach focuses on the preservation of the privacy of data with numerous SA with lesser information loss and better data utility. Anatomization approach is employed to minimize the information loss and perturbation techniques used to preserve privacy. In this case, the data miner does not know the raw data and also can get the similar result which is the key point for data miner is how to reconstruct the raw data distribution. The significant work are exists for preserving the privacy in database. But the work carried out on other document types is limited.

In order to achieve the main aim of privacy preserving data mining, hybrid approach is used to improve privacy. The proposed hybrid approach combining perturbation and anatomization with slicing for Privacy Preserving data mining. Online sensitive information of users is collected, then proposed approach is applied to anatomizes information by dissociating the quasi-identifier from SA and provides two tables, one for the QI attributes and the other for the SA. After dissociation perturbation techniques are applied to sensitive data to protect users sensitive data and also such methods applied to different documents types

Study on Implementation of Distributed and High Capacity Hybrid Wireless Network Using Three-hop Routing Protocol

Laxmidevi Kiransing Rajput¹, Dipak D. Bage²

*Department Of Computer Engineering,
SSBT's College Of Engineering And Technology, North Maharashtra University,
Jalgaon, Maharashtra, India*

Abstract - Information is directed to its destination in distributed/multi-hop way in MANET along with the intermediate nodes. In HWN, finding on demand route and route support are very important factors for multi-hop routing. MANET is less reliable and appropriate for solely transmission of native data as compare to infrastructure based wireless network. In Infrastructure based Wireless Network communication is done between nodes through base stations. Infrastructure based Wireless Network gives very high data transmission rate and access power to channel, however it suffers from the drawback of upper power utilization on mobile nodes and its safe purpose of collapse. For recognizing defect node and retrieving defective node, algorithms are presented which will expand the lifetime of HWN in factors of low power utilization and improved efficiency. An important part which affects the working of wireless network in data transmission is routing protocol. In MANET whenever some of the sensor node gets crash then use of this algorithm helps in recognizing the fault node and also will exchange the same data with another high capacity node.

Index Terms: MANET, Hybrid Wireless Networks, DTR Algorithm, RRP Algorithm, Homomorphic Encryption Algorithm

1. INTRODUCTION

Configuration wireless networks and MANET have an anxious astounding exploration interest, presently. To increase the wireless complex capacity for high performance applications has encouraged the maturity of hybrid wireless networks. HWN is an incorporation of two networks which are a configuration wireless network and a MANET. Smart-phones, PDAs, tablets and laptops these are wireless devices and have a configuration interface as well as an ad-hoc interface. A hybrid communication setup will be predominantly used in the about to future, as the volume of such consultation has been extend snappily in recent years. Such setups combine the constitutional reimburse and dissolve the disadvantages of the configuration wireless networks and MANET. Information is disperse to its destination along with the middle nodes in a multi-hop form in a MANET. On-requirement route detection or route conservation are essential in multi-hop routing. MANET are not as defensible as configuration wireless networks because of the information is carried through the wireless channels and along with the vital routing ways. MANET's are only good for divisional region data transmission by reason of multi-hop transmission.

In wireless communication, the configuration wireless network (e.g. cellular network) is the critical means of occupying every day. The inter-cell communication and the use of Internet is best with the cellular network. It makes achievable the support of universal network connectivity and wide-ranging computing by incorporating all kinds of wireless devices into the network. The Node exchange information with each other with the help of the base stations (BSes), in the configuration network. The infrastructure wireless networks can provide higher message transmission responsibility and channel access effectiveness within the long distance one-hop transmission between BSes and mobile nodes, but suffer from higher power expenditure on mobile nodes and the single point of abortion problem.

Parallelism: A New Approach in Prediction System

Kajal Borole¹

Computer Department, SSBT's COET, Jalgaon

Satpal D Rajput²

Computer Department, SSBT's COET, Jalgaon

Abstract— Now-a-days, people have a very free and convenient communication environment of internet where they show active participation to demonstrate what they actually feel about a particular event. May it be a poll result, incident, news, political issues, government schemes or any government decision for the citizens. People demonstrate their views by reacting through various parameters available on the social media. Some make a tweet using hash tags while some other prefer giving their views using statements, updating status or even updating their profiles in order to support a particular cause. But what if the predictors already know how the public is going to react on a particular event or news. For this prediction system help us out, in which there is analysis of the responses from public and then predict the future circumstances. Many applications are developed by using prediction systems. Some example are cancer detection, election poll results and many more. The day-by-day growing data can compromise the performance of the prediction system, because its obvious that growing network of data will require more storage and the system will also consume more time for its processing. In practical applications, maintenance of network storage and calculations will be costly with increasing number of nodes in the network. For this effective strategy for reducing processing time must be introduced. To reduce this processing time introducing parallelism concept can help.

Keywords— Sentiment analysis, partitioning dataset, parallel processing, combining results.

I. INTRODUCTION

A prediction or forecast, is a statement about an uncertain event. It is often, but not always, based upon experience or knowledge. There is no universal agreement about the exact difference between the two terms; different authors and disciplines describe different connotations. Although guaranteed accurate information about the future is in many cases impossible, prediction can be useful to assist in making plans about possible developments. People are becoming increasingly enthusiastic about interacting, sharing, and collaborating through online collaborative media. In recent years, this collective intelligence has spread to many different areas, with particular focus on fields related to everyday life such as commerce, tourism, education, and health, causing the size of the Social Web to expand exponentially. The distillation of knowledge from such a large amount of unstructured information, however, is an extremely difficult task, as the contents of today's Web are perfectly suitable for human consumption, but remain hardly understandable to machines. Big social data analysis grows out of this need and combines multiple disciplines such as social network analysis, multimedia management, social media analytics, trend discovery, and opinion mining. For example, studying the evolution of a social network merely as a graph is very limited as it does not take into account the information flowing between network nodes. Similarly, processing social interaction contents between network members without taking into account connections between them is limited by the fact that information flows cannot be properly weighted. Big social data analysis, instead, aims to study large-scale Web phenomena such as social networks from a holistic point of view, i.e., by concurrently taking into account all the socio-technical aspects involved in their dynamic evolution. To improve the performance of prediction system such that it will be independent or least affected by the growing data network over time.

II. LITERATURE SURVEY

According to [1] Due to the rapid development of Web, large numbers of documents assigned by readers' emotions have been generated through new portals. Comparing to the previous studies which focused on author's perspective, our research focuses on readers' emotions invoked by news articles. The research provides meaningful assistance in social media application such as sentiment retrieval, opinion summarization and election prediction. Here, the readers' emotion of news based on the social opinion network are predicted. More specifically, the opinion network based on the semantic distance is constructed. The communities in the news network indicate specific events which are related to the emotions. Therefore, the opinion network serves as the lexicon between events and corresponding emotions. Leveraging the neighbor relationship in network to predict readers' emotions is done. As a result, the methods obtain better result than the state-of-the-art methods. Moreover, we developed a growing strategy to prune the network for practical application. The experiment verifies the rationality of the reduction for application.

According to [2] With the advent to social media the number of reviews for any particular product is in millions, as there exist thousand of websites where that particular product exists. As the numbers of reviews are very high the user ends up spending a lot of time for searching best product based on the experiences stated by review writers. Here it is presented as a sentiment based rating approach for food recipes which sorts food recipes present on various website on the basis of sentiments of review writers.

A Review on Implementation of Sandhi Viccheda for Sanskrit Words

Bhagvashree D. Patil¹
M.E. Student

Computer Department, SSBT's COET, Jalgaon

Manoj E. Patil²
Associate Professor

Computer Department, SSBT's COET, Jalgaon

Abstract—Natural Language Processing is a field that covers computer understanding and manipulation of human language, and its rise with possibilities for news-gathering. Sandhi means to join or combine two words to form meaningful word. Sandhi viccheda means sandhi splitting which breaks a word into its original word. Many projects have been implemented on concept sandhi viccheda in different languages such as Hindi, Urdu, and Kannada language but in Sanskrit there are many grammar rules which are not easy to implement. As we know Hindu religious book is BHAGWATGEETA containing most difficult words which a user can't understand easily due to longer words which are combination of different words. To overcome this problem there are some rules in Sanskrit such as rules regarding with vowels, consonants and visarga which should be implemented so that any word in Sanskrit can be separated. Till today only rules with vowels of sandhi are implemented. The accuracy will be increased by implementing the rules with consonant and visarga also. Accuracy is based on the correct linguistic rules and data provided to the system.

Keywords— Natural Language Processing, Sandhi Viccheda Rules.

I. INTRODUCTION

Natural Language Processing is a field where one language can be converted into another using various approaches. Natural language processing is used for communication between computers and human languages in the field of artificial intelligence, and linguistics. Being concerned with human-computer interaction, NLP works to enable computers to make sense of human language to make interactions with machinery and electronics as user friendly as possible. Many more systems are developed for language translation like in Marathi, Telugu, Kannada, Punjabi, Hindi, etc. Sanskrit language has the most powerful grammar which gives the understanding of each word easily. The creator of Sanskrit language was Panini who formulated 3,949 rules. In NLP, not only words are there to understand but how they are linked together to derive a certain meaning is also important.

Sandhi means to join or combine two words to form meaningful word. Sandhi viccheda means sandhi splitting which breaks a word into its original word. Sandhi is a cover term for a wide variety of sound changes that occur at morpheme or word boundaries. Examples include fusion of sounds across word boundaries and the alteration of one sound depending on nearby sounds or the grammatical function of the adjacent words. Sandhi belongs to morph phonology. To develop a system for sandhi viccheda in Sanskrit is quite difficult task because of its linguistic rules.

In order to achieve the main aim of sandhi viccheda process in Sanskrit language, rule based algorithm is used for the separation of words in its constituent words. For this, the words in Bhagwatgeeta are taken as a input to the system. In Bhagwatgeeta, there are many difficult words which a user can't understand easily without knowing their constituent words. So the main goal of this project is to provide a system to users such that user can get the meaning of difficult words in Bhagwatgeeta. The input is given to the system where it analyzes the word and proceeds it towards the rule based algorithm where different rules according to the vowels, consonant and visarga are applied. Then it will be checked in the database to find the meaning of the word and the output is shown in the splitted words of original word with meaning.

Sandhi means to join or combine two words to form meaningful word. Sandhi viccheda means sandhi splitting which breaks a word into its original word. Many projects have been implemented on concept sandhi viccheda in different languages such as Hindi, Urdu, and Kannada language but in Sanskrit there are many grammar rules which are not easy to implement. As we know Hindu religious book is BHAGWATGEETA containing most difficult words which a user can't understand easily due to longer words which are combination of different words. To overcome this problem there are some rules in Sanskrit such as rules regarding with vowels, consonants and visarga which should be implemented so that any word in Sanskrit can be separated. Till today only rules with vowels of sandhi are implemented. The accuracy will be increased by implementing the rules with consonant and visarga also. Accuracy is based on the correct linguistic rules and data provided to the system.

The Study and Review of Detection of Sensitive Data Leakage for Privacy Preserving

Ruchi J Patil, Yegeshwari S. Horse

Department of Computer Engineering, SSBT's College Of Engineering and Technology, Bambhori,
Jalgaon (M.S),India

Department of Computer Engineering, SSBT's College Of Engineering and Technology, Bambhori, Jalgaon (M.S),India

Abstract - According to Risk Base Security (RBS) leakages of sensitive data record instance has grown now a days. Human mistakes plays an important role in cause of data loss among various data leak. There are various method to detect the data leak cause by human mistakes and prevent the data by generating an alert. Among various approaches, monitoring the data which is transmit for expose of sensitive information is common. Also it consider all data as sensitive and perform detection operation for all those data. However this makes the detection process difficult and detection time to increase. In addition, the data owner may require to provide detection report to the D.D provider. But there is possibility that the provider can read the sensitive data. So there is a need of new data detection solution that allow provider to scan the content for leak without learning information. Therefore one need methods that gives accurate detection with very small number of false alarm under various leak scenario and result shows that the method improve the detection time.

Keywords - Data Leak, Network Security, Privacy, Fingerprint.

I. INTRODUCTION

Today's era, most of the leaked sensitive data record has increase dramatically. Data leakage means unauthorized transmission of sensitive data or information from within an organization to an external destination where the confidentiality of information is compromise. A common approach is to monitor the data in storage and transmission for expose sensitive information. Also it consider all data as sensitive and perform detection operation for all those data. However this makes the detection process difficult and detection time to increase. In addition, the data owner may require to provide detection report to the D.D provider. But there is possibility that the provider can read the sensitive data. In order to minimize the leakage of the sensitive data, organization needs to prevent cleartext sensitive data from appearing in the storage. A screening tool is use to scan the files. Therefore one need a new data detection solution that allow provider to scan the content for leak without learning information. Therefore one need methods that gives accurate detection with very small number of false alarm under various leak scenario.

Human mistakes plays an important role in cause of data loss among various data leak. There are various method to detect the data leak cause by human mistakes and prevent the data by generating an alert. Among various approaches, monitoring the data which is transmit for expose of sensitive information is common. Also it consider all data as sensitive and perform detection operation for all those data. However this makes the detection process difficult and detection time to increase. So there is a need of new data detection solution that allow provider to scan the content for leak without learning information. Therefore one need methods that gives accurate detection with very small number of false alarm under various leak scenario and result shows that the method improve the detection time.

In order improve the detection time and detection of sensitive data packet, lost assisted mechanism is used which checks the frequency of occurrence of data. Highly differentiated values are considered as sensitive and fingerprints are generated for them. Repeated values are ignored in this method. Statistical approach is use to generate sensitive data and it is stored in table. The fingerprints are generated by data leak detection (DLD) provider and identifies potential leaks by matching the fingerprints. The potential leak consist of real leaks and

Continuous User Identity Verification Using Biometric

Priyanka L. Patil
Department of Computer Engineering
SSBT COET Bambhori, NMU

Prof. Dr. Girish K. Patil
Department of Computer Engineering,
SSBT COET Bambhori, NMU

Abstract—Session management in distributed internet services is traditionally based on username and password, explicit logouts and mechanisms of user session expiration using classic timeouts. And, most of the systems are based on pairs of username and password which verifies the identity of user only at login phase. Once the user is identified with username and password, no checks are performed further during working sessions. Emerging biometric solutions allow substituting username and password with biometric data during session establishment, but in such an approach still a single verification is deemed sufficient, and the identity of a user is considered immutable during the entire session, because the identity of user is permanent during whole session. Hence, a basic solution is to use very short period of timeouts for each session and periodically request the user credentials over and over. However it heavily affects the service usability and ultimately the satisfaction of users. The paper explores the system for continuous authentication of user using credentials such as biometric traits. The use of continuous biometric authentication system acquires credentials without explicitly notifying the user or requiring user interaction that is, transparently which is necessary to provide better service usability. Also, paper overcomes the problem of network traffic by making use of OTK for authentication purpose as transferring biometric data over low capacity network is not feasible.

Keywords— session management, continuous verification, multimodal biometric, transparent authentication, OTK

I. INTRODUCTION

In current technology era security of web-based applications is a serious concern, due to the recent increase in the frequency and complexity of cyber-attacks, biometric techniques offer emerging solution for secure and trusted user identity verification, where username and password are replaced by bio-metric traits. Biometrics is the science and technology of determining identity based on physiological and behavioural traits. Biometrics includes retinal scans, finger and handprint recognition, and face recognition, handwriting analysis, voice recognition and Keyboard biometrics. Also, parallel to the spreading usage of biometric systems, the incentive in their misuse is also growing, especially in the financial and banking sectors. In fact, similarly to traditional authentication processes which rely on username and password, biometric user authentication is typically formulated as a single shot, providing user verification only during login time when one or more biometric traits may be required. Once the user's identity has been verified, the system resources are available for a fixed period of time or until explicit logout from the user.

Currently used approach is also susceptible for attack because the identity of the user is constant during the whole session. Suppose, here we consider simple scenario; a user has already logged into a security-critical service, and then the user leaves the PC unattended in the work area for a while the user session is active, allowing impostors to impersonate the user and access strictly personal data. In these scenarios, the services where the users are authenticated can be misused easily. Hence the need of new system to tackle this problem has arisen.

To deal with the problem use very short session timeouts and request the user to input his login data again and again which is not a satisfactory solution. So, to timely identify misuses of computer resources and prevent that, solutions based on bio-metric continuous authentication are proposed, that means turning user verification into a continuous process rather than a one-time authentication. Biometrics authentication can depend on multiple biometrics traits. The use of biometric authentication allows credentials to be acquired transparently i.e. without explicitly notifying the user to enter data over and over, which provides guarantee of more security of system than traditional one.

In a multi-modal biometric verification system designed and developed to detect the physical presence of the user logged in a computer. The proposed approach assumes that first the user logs in using a strong authentication procedure, then a continuous verification process is started based on multi-modal biometric. Verification failure together with a conservative estimate of the time required to subvert the computer can automatically lock it up. Similarly, in a verification system presented, which continuously verifies the presence of a user working with a computer. If the verification fails, the system reacts by locking the computer and by delaying or freezing the user's processes.

The rest of the paper is organized as follows. Section II gives us the basic background about the topic along with the related research done by other people. Section III introduces the existing system. And section IV gives idea about the proposed solution to deal with current problem, while conclusion is in section V.

TEXTUAL SIMILARITY DETECTION-A SURVEY

Shital Liladhar Patil*
Department Of Computer Engineering
SSBT's COET, Bambhori

Krishnakant P. Adhya
Department Of Computer Engineering
SSBT's COET, Bambhori

Abstract— Measuring Textual Similarity between words/terms, sentences, paragraph and document plays an important role in computer science. In natural language processing (NLP), Semantic textual similarity is an important component for many tasks such as document summarization, word sense disambiguation, short answer grading, information retrieval and extraction. The lexical overlapping approach evaluate similarity among sentence and find whether a sentence pair semantically equivalent or not. Existing methods for computing sentence similarity have been adopted from approaches used for long text documents. These methods process sentences in a very high-dimensional space and are consequently inefficient, require human input, and are not adaptable to some application domains. Semantic textual similarity methods improved in two areas, first is semantic relation between word and second is semantic resources to reduce dimension and overcome disadvantages of existing methods. In this paper, we have given the survey of various techniques and methods for textual similarity detection from sentence.

Keywords— Natural language processing, Semantic textual similarity, Word similarity, Sentence similarity, Text similarity.

I. INTRODUCTION

Finding the similarity among the sentences in natural language processing (NLP) plays a vital role because a sentence can be expressed in many forms without varying the sentence meaning. Therefore there is a need to identify the semantic similarity among the sentence pair. Measuring and recognizing semantic relation between the pair of sentence is the problem of semantic similarity. The similarity can be measured at different levels of abstraction i.e., between words or sentences or paragraphs or documents and at multi levels such as word to sentence or sentence to paragraph etc., Traditionally, techniques for detecting similarity between documents have centered on analyzing shared words. [1]

Such methods are usually effective when dealing with long texts because similar long texts will usually contain a degree of same words. In short texts the word co-occurrence may be rare. And mainly due to the inherent flexibility of natural language enabling people to express similar meanings using quite different sentences in terms of structure and word content. The information in short texts is very limited and this problem poses a difficult computational challenge.

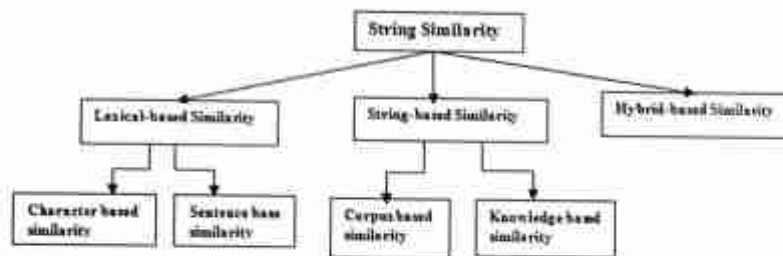


Fig 1: Sentence Similarity Architecture

ISOLATION PRODUCTION AND POTENTIAL APPLICATION OF BIOSURFACTANT- A Review

Deepmala Desai^{1*}
Dept. of Applied Science
SSBT
COET, Bambori, Jalgaon

Manksha Rajput^{2*}
MIDC Jalgaon

Anil R. Mal^{3*}
Dept. of Applied Science
SSBT
COET, Bambori, Jalgaon

Meera V. Deshpande^{4*}
Dept. of Applied Science
SSBT
COET, Bambori, Jalgaon

Abstract :

Naturally occurring surface-active compounds derived from micro-organisms are called bio-surfactants. Biosurfactant are amphiphilic compounds produced in living surfaces, mostly on microbial cell surfaces or excreted extracellular hydrophobic and hydrophilic moieties that confer on the organism the ability to accumulate between fluid phases thus reducing surface and interfacial tension. The ability to reduce surface tension is a major characteristic of surfactant. Surface-active compounds commonly used in industries are chemically synthesized. However, bio-surfactants have been paid increasing attention to replace the synthetic surfactants owing to their advantages such as biodegradability and low toxicity. Bio-surfactants can be produced with high yield by some microorganisms, especially *Pseudomonas* sp. These microorganisms can use the various renewable resources, especially agro industrial wastes, as the potential carbon sources. The use of bio surfactant for this purpose was found to be eco-friendly approach and also an alternative to conventional complex remediation. The current review summarizes research carried out on isolation and production of biosurfactant and its potential applications and future scope of research in various fields.

KEYWORDS:- Biosurfactants, Emulsification, Application, Vegetable oil refining, Toxicity, Biodegradability

INTRODUCTION:-

Biosurfactant can be defined as surface active biomolecules produced by micro-organism. Biosurfactant are biologically produced surfactants which are naturally produced by bacteria, fungi and yeast. Due to their unique properties like specificity low toxicity and surface active biomolecules have attracted wide interest. Biosurfactants are amphiphilic biological compounds produced extra cellular or as part of cell membranes by a variety of yeast, bacteria and fungi from various substance including sugars, oils and wastes. Biosurfactant have several advantages over synthetic surfactant such as higher biodegradability, lower toxicity, good biocompatibility with eukaryotic organism, effectiveness at wide range of temperature, pH, salinities synthesis under user friendly conditions.

The bio-surfactant are complex molecules covering a wide range of chemical types including peptides fatty acids, phospholipids, glycolipids, antibiotics, lip peptides etc. Biosurfactant lead to an increasing interest on these microbial products as alternatives to chemical surfactants [1] It has been focused that improving the method of biosurfactant production and characterizing the major properties of the biosurfactant are highly important in the commercial application of biosurfactant. This review includes the factors influencing biosurfactant production, potential industrial application and future research needs.

PRODUCTION AND POTENTIAL APPLICATION OF BIOSURFACTANT

B. Anandam et.al [2] carried out research on ISOLATION AND PRODUCTION OF BIOSURFACTANT PRODUCING ORGANISM FROM OIL SPILLED SOIL.

The isolation of biosurfactant producing bacteria, the sample was collected from automobile workshop, where the oil spilled in the soil.

The isolated colonies were tested for their bio-surfactant production by two methods.

MATLAB SOLUTIONS FOR HEATING AND COOLING EFFECT OF A THIN ANNULAR DISC

Santia S. Patil¹

SSBT's College of Engineering & Technology,
Bambhori, Jalgaon (M.S.), India

Applied Science Department

North Maharashtra University,
Jalgaon(M.S.), India

K.S.Patil²

SSBT's College of Engineering & Technology,
Bambhori, Jalgaon (M.S.), India

Applied Science Department

North Maharashtra University,
Jalgaon(M.S.), India

P.ILZOPE

SSBT's College of Engineering & Technology,
Bambhori, Jalgaon (M.S.), India

Electronics and Telecommunication
Department

North Maharashtra University,
Jalgaon(M.S.), India

Abstract - The paper is concerned with the inverse unsteady-state problem of determining the temperature (in heating and cooling process). Homogeneous boundary conditions of the third kind are maintained on curved surfaces of the disc. The finite Marchi-Zgrablich and Laplace transform techniques are used to find the solutions of the inverse transient thermoelastic problems of a thin annular disc. Matlab programming is used to find numerical results.

Keywords— Thermoelastic, Annular disc, Boundary conditions, Laplace transform, Marchi-Zgrablich Transform

1. INTRODUCTION

The inverse unsteady state thermoelastic problem of determining the temperature (in heating and cooling process), displacement and stress functions of the disc occupying the space $D: a \leq r \leq b, 0 \leq z \leq h$ with the stated boundary conditions.

The inverse problem is very important in view of its relevance to various industrial machines subjected to heating such as main shaft of the lathe and turbine and roll of a rolling mill.

A related problem of determining the temperature, displacement and stress functions due to partially distributed heat supply at $z = \xi$ ($0 < \xi < h$) in a thin annular disc^[1] is reconsidered to study the temperature (in heating and cooling process).

Discussion on some similar problems may be found in *Enzik*^[2], *Soedilo*^[3], *Hetnarski and Eshal*^[4]. The corresponding correct expressions are derived in the present paper. Also, the numerical results are obtained by using Matlab programming and presented graphically.

2. A THIN ANNULAR DISC IN THE PLANE STATE OF STRESS;

Consider a thin annular isotropic disc of thickness h occupying the space $D: a \leq r \leq b, 0 \leq z \leq h$. The differential equation governing the displacement function $U(r, z, t)$ is

$$\frac{\partial^2 U}{\partial r^2} + \frac{1}{r} \frac{\partial U}{\partial r} = (1 + \nu) \alpha_r T \quad (2.1)$$

Assessment of Mass Awareness and Willingness for Environmental Protection

Dr S B Pawar¹, Dr S L Patil², Dr V R Diware³

1. Civil Engineering Department, SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India.
2. Civil Engineering Department, SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India.
3. Chemical Engineering Department SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India.

Abstract:

All living and non living creatures are integral parts of a web called as environment. The web supports all of us and in fact is the cause of our existence. Unfortunately the environment is getting severely polluted and is threatening to the very existence of life on earth. The inter-governmental panel on climate changes has established that the primary cause of environmental pollution is life style. Consequently the environmental degradation can be prevented through mass participation. The society should have awareness regarding environmental friendly life style and its significance. At the same time the society should have a willingness to adopt the lifestyle friendly to environment. The present work is a case study done for the assessment of the awareness as well as the willingness for the people to adopt environmental friendly life style.

Key Words:

Environmental degradation environmental friendly life style, mass awareness, mass willingness.

1. Introduction

The present scenario of environmental pollution is horrifying. The global warming and climatic changes have reached to the level that scientists are putting up question mark on the very existence of mankind. The life quality is being degraded and class struggles in various forms are emerging up in the various parts of the world. What is the root cause of environmental problems? In 1988, United Nations formed a panel named as the inter-governmental panel on climatic changes (IPCC) [1], [2].

Impact on Health due to Air Pollution: a case study of Jalgaon City

Dr S B Pawar¹, Dr H Husain², Dr S A Thakur³

1. *Civil Engineering Department, SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India.*
2. *Mechanical Engineering Department, Mandsaur Institute of Technology, Mandsaur, MP, India.*
3. *Chemical Engineering Department SSBT's College of Engineering & Technology, Bambhori, Jalgaon, MS, India.*

Abstract:

According to an estimate out of total air born disease patients, 80% are in India. The problem spans over the whole world, from developed countries to the developing countries. Air pollution in cities causes a shorter lifespan for residents, especially to the child. Developing countries have reported a significantly high mortality rate due to air pollution. Assessment of dynamics of air born diseases is necessary to understand the scenario of air pollution and consequently to adopt appropriate control measures.

The present work is a case study for city of Jalgaon 21.0077° N, 75.5626° E. NH 6 (AH 47) passes through the city of Jalgaon. It has a very high traffic density, resulting into high level of air pollution all around. The impact of air pollution is quantified by surveying the hospitals of Jalgaon city and interviewing the doctors. A rising pattern in the number of patients suffering due to air pollution is being observed. It is a matter of serious concern and needs immediate attention.

Key words:

Air pollution, air born diseases, health impact.

1. Introduction

Clean air is bliss of nature. However, it has become scarce now a days. One can refuse to drink the water or refuse to eat the meals if seems to be unpalatable. However, no one can refuse to breathe however polluted the air may be. We breathe 16 times a minute and ingest 21000 L air per day. Air pollution in cities causes a shorter lifespan for residents, specially to the child. Developing countries have reported a significantly high mortality rate due to air pollution. Studies done by following researchers have reported very poor quality of

Study of Rotating Biological Contactors (RBCs) for Wastewater Treatment Process

Majid R. Yimide¹
Student

Prof. Jyoti R. Mali²
Assistant Professor

Prof. Souvik D. Patil³
Assistant Professor

Civil Engineering Department^{1,2,3}
SSBT's College of Engineering and Technology, Bambhori, Jalgaon

Abstract- There is many domestic wastewater treatment processes in use today. Rotating biological contactors (RBCs) constitute a very unique and superior alternative for biodegradable matter. Pb, BOD and COD removal requires very less area, low energy consumption, short start-up, low operating and maintenance cost and high treatment efficiency. The present study of RBCs model and results focused on parameters that affect performance of the unit like Detention time, rotational speed, influent and effluent waste water characteristics, biofilm formation on the media and change in the effluent characteristics were studied for different parameters. Present study was undertaken to analyze the feasibility treatment of waste water by using combinations within the RBC unit fitted with various operating conditions. In all, 10 combinations of discs were studied to judge the performance of treatment through RBC units. The unit was divided in to two identical stages and discs were arranged parallel to each other. Discs were immersed 40% in the water. The Rotating Biological Contactor (RBC) system was fed with waste water from various localities. Comparing the result obtained for reduction in BOD and COD.

Keywords - RBC, COD, BOD, influent and effluent

I. INTRODUCTION

A rotating biological contactor (RBC) is a growth bioreactor that offers an alternative technology to the conventional activated sludge process. Firstly RBC system was installed in the 1900 century was consisting of a cylinder with wooden slats (Mathure and Patwardhan 2005). Current mainstream technologies for treatment of domestic wastewater, such as activated sludge and tertiary nutrient removal are too costly to provide a satisfactory solution. RBC system represents an excellent option for sewage treatment. RBC is an attached growth bioreactor that offers an alternative technology to the conventional activated sludge process. Because it allows a sufficiently long biomass detention time, it is a compact unit, its energy cost is very less, it is very easy to operate, it has high process stability. It also has high specific removal rate. Research carried out in the RBC system was particularly for improving the performance of rotating biological contactor. The effect of rotational speed of the discs and different media on the performance of rotating biological contactor was studied. In this paper the details of experimental model and results obtained on experimental investigations of treatment process are presented. The results of this modeling give an idea about the efficiency and performance of RBC under various operating conditions.

Excess biomass shears off at a steady rate at the media rotator. These solids are carried through the RBC system for removal in a conventional clarifier. Benefits include improving efficiency, consistent process results and stable operation with minimum supervision of the operator, economical, minimum head loss through the system, low energy consumption and minimum maintenance. The Rotating Biological Contactor (RBC) is one of the most efficient fixed film wastewater treatment technology having typical applications for municipal wastewater treatment method.

II. LITERATURE REVIEW

This paper deals with the identification of filamentous microorganisms present in the biofilms formed over the RBC surface. Biofilms were obtained from three municipal wastewater treatment plants with an RBC system. Here an experimental study on the treatment of municipal waste water at a temperature of 12-24°C in an RBC system is done. This RBC system is divided in to two similar stages connected in series to optimize the performance of RBC system, this system of stages was operated at different organic loading rates and hydraulic detention time. The overall efficiency for removal of COD significantly decreases with decrease in total HRT from 10 to 24 hrs and increase in OLR from 1.1 to 47g/m²/d. Thus the effluent soluble COD quality remains unaffected. Maximum value of the COD were removed in 1st stage of this system and nitrification took place in 2nd stage [1].

Rotating biological contactors (RBC) constitute a very unique and superior alternative for biodegradable matter and removal of nitrogen on the basis of their operation and simplicity of design, with short start-up, consuming less area, less energy consumption, low operating cost, less maintenance cost and more treatment efficiency. This paper review on RBC focuses on the parameters that affect performance like rotational speed, organic and hydraulic loading, detention time, biofilm support media, influent and effluent wastewater, staging, temperature [2].

Fixed film systems operate with little operator intervention and monitoring and generally use simple, low maintenance equipment is shown in this paper. For the activated sludge, the operator should constantly be aware of conditions so that could lead to inadequate BOD removal, requires continuous monitoring of the wastewater, amount of dissolved oxygen in the aeration basin and the type

EXPERIMENTAL STUDY ON PERFORMANCE OF COMPOSITE BEAMS

Priyanka Asutkar⁽¹⁾ Pankaj Punise⁽²⁾,
Assistant Professor⁽³⁾

G.H. Raisoni Institute of Engineering and Management, Jalgaon⁽¹⁾,
NNIT College of Engineering and Technology Bambhori, Jalgaon, MH, India⁽²⁾

Abstract

India has done a major leap on developing the infrastructures such as express highways, power projects and industrial structures, dams etc. to meet the requirements of globalization. For the construction of civil engineering works, concrete play main role and a large quantum of concrete is being utilized. Both coarse aggregate and fine aggregate is a major constituent used for making conventional concrete, has become highly expensive and also scarce. Huge amount of rubber tyre waste is generating day by day which creates the disposal problem and has many environmental issues. As this scrap rubber waste is an elastic material having less specific gravity, energy absorbent material can be used as a replacement material for obtaining light weight concrete. In present study the aggregates in less stress concrete zone below the neutral axis are replaced by the scrap material like scrap tyre rubber aggregates (STRA) for one set and for other set fine aggregates in concrete are replaced by steel scrap (SS). Replacement is done with varying proportion from 0% to 60% with increment of 20 %. Method of initial functions is used for finding bending stress of beams. The Method of initial functions (MI) is an analytical method of elasticity theory.

Key word: Rubber scrap, steel scrap, Method of initial functions, beams.

1. INTRODUCTION

"Energy cannot be created, it cannot be destroyed", it is the base of all intellectual and spiritual thoughts of human beings. Energy is always subjected to cycles. Thus nothing as such is a waste. The waste generate from one process is in fact a raw material for some other process. Waste is a material that is wrongly placed or laying unutilized. Hence there is a need to decide the suitable place where a particular waste material may be used or recycled. The present work is concerned with the reuse of scrap tyre and steel scrap waste which is as such a solid waste generated in gigantic proportions.

One of the most crucial environmental issues all around the world is the disposal of the waste materials. Accumulations of discarded waste tyres have been a major concern because the waste rubber is not easily biodegradable even after a long period landfill treatment. Thus it gets accumulated and creates variety of problems. It creates unsightly appearance. If burnt under conventional uncontrolled fashion it creates harmful vapours. If dumped in land fill sites, in rainy seasons it accumulates water and harbours mosquitoes and fly bleedings. If buried in land fill sites, it slowly decomposes under anaerobic environment and generates methane. Methane is generated by other sources also in land fill sites [1]. Adding industrial steel solid wastes obtained from lathes in concrete enhances its compressive strength [2]. When rubber aggregates are increase there is decrease in mechanical properties of concrete depends on type and content of rubber used [3]. The Slump and workability was significantly increased with the introduction of recycled

A Study of Goods & Services Tax (GST) & Its Impact on India: Review

Dr. Harshad Anil Sahukhe

Asst. Prof. SSBT's COET, Bambhori, Jalgaon

Abstract- Government of India has implemented Goods & Services Tax (GST) in India on 1 July, 2017. This is the major indirect tax reform in the history of India, outcome of which various Central & State taxes subsumed under GST viz. Central Excise Duty, Service Tax, Additional Duty of Excise, Surcharges, Cess, Countervailing Duty, Special Additional Duty, Sales Tax, VAT, Purchase Tax, Luxury Tax, Entry Tax etc. In this paper researcher has analyzed the structure of GST, impact of GST on Indian economy and practical difficulties faced by industry as well as consumers while implementing GST. This paper is based on detailed study of GST Act, various articles published in newspapers, unbiased opinion of tax experts and experience of stakeholders. Implementation of GST may result into increased revenue generation for Government of India, this surplus revenue may contribute to the growth of economy by way of investment in various infrastructural & development projects by Government of India. GST may have positive impact on economy, four tier structure of tax rate under GST may result into massive price hike of luxurious Goods & Services as well Government has taken efforts to put Goods & Services of necessity under lowest slab of tax rate.

Keywords- Impact, Goods & Services Tax (GST), Economy, Consumers & Industry.

I. INTRODUCTION

In spite of having less sales turnover, most of the individuals, small and medium size entrepreneurs were required to obtained registrations under earlier tax regime due to lower threshold limits of sales turnover. In addition to that a single individual or entrepreneur was also required to register with different Central and State tax authorities like Central Excise, Service Tax, Sales Tax etc. Threshold limit of sales turnover is doubled up by Government under GST, except for the Special category States. This change would help small and medium size entrepreneurs to avoid tax burden and unwanted compliances. Requirement of multiple registrations like earlier tax regime would also go away under GST. Implementation of GST in the State of Jammu & Kashmir is the biggest achievement of GOI and would add more revenues to the treasury of GOI. GST would remove cascading effect of taxes and would help industry to minimize cost of production and it would also provide seamless credit throughout the supply chain. Newly introduced Anti-profiteering measure would ensure passing of benefit of reduced tax rate or benefit of input tax credit by way of commensurate reduction in prices. This has significantly reduce cost of original goods and will endorse 'Make in India'. The areas which have extensive value & supply chain with processes spread in many States such as FMCG, Pharma, Consumer Durables, Automobiles and Engineering goods has the major beneficiaries of GST. A fair tax system should keep in view issues of income sharing and at the same time should also take efforts to generate tax revenues to support Government spending on public services and infrastructure development. The ongoing tax reform of shifting to Goods and Services Tax would impact the Indian economy, international trade and commerce, industry and ultimately to consumers in a very positive way. No doubt GST would simplify indirect tax system and would also help to eliminate difficulties created by the earlier taxation system. We are prepared to deal with GST and numerous other changes that are going to take place in India. The GST Board has made four main tax rate slabs for many items: low rate of 5 percent, normal rates of 12 percent and 18 percent, and higher rate of 28 percent. Some of the goods had higher actual tax rates before GST but the new tax plan has reduce the burden of taxes on customers. There are some goods which has to be taxed at a higher rate, customers may experience increase in costs of such goods. However, it must be noted that the government has kept important items of everyday use tax free, that is, either at NIL rate of tax rate or completely exempted from tax under GST. There are list of items, total 1,211 items and 600 services are placed under the different tax slabs, and it is burden to keep a track of all of them. Post GST, 43 percent items has fall under 18 percent tax rate, 19 percent items would fall under 28 percent tax rate, 17 percent items would fall under 12 percent tax rate, 14 percent items would fall under 5 percent tax rate and 7 percent items would come under exemption list. Previously had a dual system of taxation of goods and services in India, which is different from that GST. Taxes on goods are described as "VAT" at both Central and State level. It has accepted value added tax principle with input tax credit mechanism for taxation of goods, with limited cess levy set off. Same principle were adopted in Central Excise and Service Tax with certain restrictions of cross levy set off, recently introduced Swachha Bharat Cess and Krishi Kalyan Cess was one of them and increased tax burden of common man by 1 percent.

Customer Based Brand Equity: A Review of Literature

Mr. Mukesh B. Ahirrao¹, Dr. D. S. Patil²

¹Ph.D. Research Scholar, North Maharashtra University, Jalgaon, MS, India,

²Research Guide, Professor & Principal, TES's Art's, Commerce & Science Women College, Nandurbar, MS, India.

Abstract:

The concept of brand equity first appeared in 1988. Since then, it has attracted the eyes of many researchers and academicians and ample thoughts were contributed by them. Marketing Science Institute has recognized research in brand management as research priorities in 2010. This research article is based on secondary data and it tries to explore the concept of customer based brand equity and its associated components.

Keywords: Brand Equity, Brand Awareness, Brand Association, Brand Attitude, Brand Image, Brand Loyalty, Brand, Branding.

Introduction:

The modern perspective of marketing is centered on the satisfaction of customer in order to achieve the organizational goals. This focus on customer satisfaction is the need of hours due to immense competition in market. Over the last 100 years, the process of marketing has been evolved from exchange orientation to today's modern marketing concept through product, production and sales orientation^[1]. The changes occurred during this evolution of marketing process resulted in excess production and stock of goods available in market in relation to demand for the products. This excess production of goods led to the severe competition in market place requiring business firms to differentiate their products from the products of other competing firms. As a result, business firms started to create the different identity of their own product. Such strategies of product differentiation require more focus on incremental customer satisfaction as well as to reengineer the organizational strategies on the other hand to achieve the organizational goals.

Managing Technological Advancement with Strategic Management to Gain Competitive Advantage

Ms. Faroza A. Kazi
*Department of Business Administration,
SSBT's COET, Bambhori, Jalgaon.*

Dr. Richa A. Mudiyani
*Department of Business Administration,
SSBT's COET, Bambhori, Jalgaon.*

Abstract-

Technological advancements have helped businesses and organizations save time and cost of production, which has been an advantage to all business, they manage these advancements to gain competitive advantage. This paper discusses the importance and need of technology and innovation strategy into business strategy to achieve overall competitive advantage for the company. The use of technology and innovation in value creation system is highlighted in a way that it plays a pivotal role in productivity, economic growth, increasing wealth in socioeconomic environment, and evolution of entire industries. In the globalized business, companies require strategic thinking and only by evolving good corporate strategies they can become strategically competitive. Strategy formation and execution in the context of technology is discussed that technology strategy should be aligned to corporate strategy competitiveness for the company. Moreover, what benefits companies can get from these are highlighted and discussed in relation to corporate business strategy. As an example, RFID Deployment in INDIAN RAILWAYS: A case study of E-Transport Initiative in India becoming a market leader using technology strategy has also been discussed in this paper.

Keywords: Technology, Innovation, Strategy, Competitive Advantage & RFID.

1. Introduction

Our personal life is highly dependent on the technology that people have developed. Technology has advanced with years and it has changed the way we purchase products, the way we live, the way we communicate, the way we travel, the way we learn and so many changes have been brought about by these continuous technological advancements. Technological advancements during the past century have made economy and social environments very complex and competitive. Technological advancements have brought about drastic changes in evolution of industries over time. Especially in highly technology oriented industries, technological competition on global scale makes a significant managerial challenge for firms or organizations. The basic and absolute question is how firms can manage strategically their product offering, value chain system, product strategies and technology, computerized and capabilities in complex changing business and technological environment.

Technology plays a pivotal role in managing environment for better productivity, innovation and business model development. Companies do struggle in adapting to new technological trends, and investments optimization process to cater for new opportunities in the market place. Therefore, fundamental need for companies is to be capable of creating and executing business and technology level strategies side by side to achieve sustained competitiveness and value creation. In order to achieve high return on investments and better performance as a whole, enterprises need to have strategic management capabilities. The term 'strategic' in relation to technology management emphasizes the linkage of strategic management with technology management. Furthermore, strategic refers to strategic technology management as being separate own discipline itself apart from other managements like innovation management and R&D management which surrounds technology management activities. Thus, strategic technology management is placed or considered apart from other types of management in practice.

“FOOD SAFETY: CHALLENGES & OPPORTUNITIES TOWARDS STREET FOOD MARTS: A CASE STUDY FOR JALGAON CITY”

P.A ANAWADE

Research Scholar, Department of Business Administration, SSBT's College of Engineering & Technology, Bambhori, Jalgaon-425001, Maharashtra.

Abstract:

The important aspect of this paper is food hygiene, which refers to many practices needed to safeguard the quality of food from production to consumption. This is sometimes referred to as 'from farm to fork' or 'from farm to table', because it includes every stage in the process from growing on the farm, through storage and distribution, to finally eating the food. It also includes the collection and disposal of food wastes. Throughout this chain of events there are many points where, directly or indirectly, knowingly or unknowingly, unwanted chemicals and microorganisms may contaminate the food. The term 'food hygiene' refers particularly to the practices that prevent microbial contamination of food at all points along the chain from farm to table. Food safety is a closely related but broader concept that means food is free from all possible contaminants and hazards. Food hygiene is vital for creating and maintaining hygienic and healthy conditions for the Production and consumption of the food that we eat.

The purpose and Scope of the work is to develop the Code of Hygienic Practice for Street-Vended Foods for the Jalgaon City. Street vendors form a very important segment of the unorganized sector in the countries of this region. Street vendors are often those who are unable to get regular jobs in the remunerative formal sector on account of their low level of education and skills.

Keywords: Street Food, Food safety, Hygiene, consumption, Food poisoning.

MODIFIED MULTI – MEDIA FILTER FOR DOMESTIC WASTEWATER TREATMENT

Anurag K. Gahale¹
P.G. Student
Department of Civil Engg.
(Environmental Engg.) SSBT COET
JALGAON

Prof. P. E. Charvan
Assistant Professor
Department of Civil Engg., SSBT
COET JALGAON

Dr. Mujabid Husain
Head of Department
Department of Civil Engg., SSBT
COET JALGAON

Abstract: Water is one of the most vital elements involved in the creation and development of healthy life. Since water is such a important resource for survival of both plants and animals, it is our responsibility to manage this resource, not only as a social, industrial and commercial good but also for the sustainable benefit of all living matter. Increasing pressure to get more stringent discharge standards or not being allowed to discharge treated effluent has led to implementation of a variety of advanced biological treatment processes in recent years. Current and future fresh water demand could be met by enhancing water use efficiency and demand management. Thus, wastewater is emerging as potential source for demand management after essential treatment. Biological treatment is an good and important part of any wastewater treatment plant that treats wastewater from either municipality or industry having soluble organic impurities or a mix of the two types of wastewater sources. The main advantage of attached growth systems is that they maintain a high concentration of microorganisms resulting in high removal rates at relatively small hydraulic retention times. The basic design and operational characteristics of various systems are presented in terms of packing materials, organic loading rates, treatment temperature, as well as achieved removal rates. Filtration technology is a low cost treatment technology based on physical process to treat wastewater by removing contaminant like COD, BOD, turbidity and suspended solids for a wide range of applications in domestic as well as industrial applications. Research on alternate filtration media, has expanded the options available for improving effluent quality.

Keywords:— Filtration, Domestic Wastewater, Packing materials, Multi – Media Filters.

1. INTRODUCTION

Wastewater is any water that has been adversely affected in quality by anthropogenic influence. It comprises liquid waste discharged by domestic residences, commercial properties, industry, and/or agriculture and can encompass a wide range of potential contaminants and concentrations. In the most common usage, it refers to the municipal wastewater that contains a broad spectrum of contaminants resulting from the mixing of wastewaters from different sources. Wastewater also known as sewage originates from residential commercial and industrial area. Wastewater engineering is that branch of environmental engineering in which the basic principles of science and engineering are applied to solving the issues associated with the treatment and reuse of wastewater. The ultimate goal of wastewater engineering is the protection of public health in a manner commensurate with environmental, economic, social, and political concerns. When untreated wastewater accumulates and is allowed to go septic, the decomposition of the organic matter it contains will lead to nuisance conditions including the production of malodorous gases. In addition, untreated wastewater contains numerous pathogenic microorganisms that dwell in the human intestinal tract.

Wastewater also contains nutrients, which can stimulate the growth of aquatic plants, and may contain toxic compounds or compounds that potentially may be mutagenic or carcinogenic. For these reasons, the immediate and nuisance-free removal of wastewater from its sources of generation, followed by treatment, reuse, or dispersal into the environment is necessary to protect public health and the environment. Wastewater facilitates treatment and reduces risk. Strengthening institutional capacity and establishing links between water delivery and sanitation sectors through inter-institutional coordination leads to more efficient management of wastewater and risk reduction. Filtration is one of the oldest and simplest methods of removing those contaminants. Generally, filtration methods include slow sand and rapid sand filtration. Reliable operation for sand filtration is possible when the raw water has low turbidity and low suspended solids. For this reason, when surface waters are highly turbid, ordinary sand filters could not be used effectively. Therefore, the roughing filters are used as pre-treatment systems prior to sand filtration. Furthermore, roughing filters could reduce organic matters from wastewater. Therefore, roughing filters can be used to polish wastewater before it is discharged to the environment.

Besides that, the purpose of wastewater treatment is to remove pollutants that can harm the aquatic environment if they are discharged into it. Because of the deleterious effects of low dissolved oxygen concentrations on aquatic life, wastewater treatment engineers historically focused on the removal of pollutant that would deplete the DO in receiving waters. Biological treatment is an important and integral part of any wastewater treatment plant that treats wastewater from either municipality or industry having soluble organic impurities or a mix of the two types of wastewater sources. The obvious economic advantage, both in terms of capital investment and operating costs, of biological treatment over other treatment processes like chemical oxidation; thermal oxidation etc, has cemented its place in any integrated wastewater treatment plant. There are several opportunities for improving wastewater irrigation practices via improved policies, institutional dialogue, and financial mechanisms, which would reduce risks in agriculture. Effluent standards combined with incentives or enforcement can motivate improvements in water management by household and industrial sectors discharging wastewater from point sources.

Design and Development of Human Operated Flywheel to Generate Electricity

Dr. D. S. Deshmukh ⁽¹⁾, Pravin Dharmaraj Patil ⁽²⁾, Ramlant B. Patil ⁽³⁾

Associate Professor ⁽¹⁾, Assistant Professor ⁽²⁾, M.E. Student ⁽³⁾

Dr. Babasaheb Ambedkar College of Engineering and Research, Nagpur. (M.S.) India⁽¹⁾
SSBT's College of Engineering and Technology, Bambhori, Jalgaon. (M.S.) India⁽²⁾⁽³⁾

Abstract

Power Generation Using human effort is a force for the future. With increasing demand for fuel and a new source of energy, development of human powered generators become a necessity. The most famous human powered generator is dynamo. On similar lines various human powered generators like backpack generators, biomechanical energy harvester and shoe generator are being developed. These harvesters are under development and are considered one of the best inventions of recent times. One such way is to develop alternate source of energy which will help us to save energy. Geothermal energy, biogas, solar energy, wind energy are various forms of energy which are used alternatively today. One such source of energy is Human Power. Human power is an endless source of energy which has been wasted. The energy is stored in a mechanical form and retransmitted to the wheel in order to help the acceleration. Electric vehicles and hybrid have a similar system called Regenerative Brake which restores the energy in the batteries. The device recovers the kinetic energy that is present in the waste heat created by the car's braking process. It stores that energy and converts it into power that can be called upon to boost acceleration. There are principally two types of system - battery (electrical) and flywheel (mechanical). Electrical systems use a motor-generator incorporated in the car's transmission which converts mechanical energy into electrical energy and vice versa.

Keywords: Human Power machine, Bicycle, Technology, Dinapod, Flywheel.

1. INTRODUCTION

In a world with growing demand for energy, it has become a necessity for alternate source of energy. As a result various inventions have been made to overcome the issue. Increasing efficiency of electrical and mechanical products has been one of the ways to reduce energy consumption. These techniques are useful for reducing energy consumption. One such way is to develop alternate source of energy which will help us to save energy. One such source of energy is Human Power. Human power is an endless source of energy which has been wasted. Humans eat food and spend it on his work without proper conversion of energy. This paper brings to light various benefits of human power also the harvesters used to utilize this power.

Humans are a rich source of energy. An average-sized person stores as much energy in fat as a 1000-kg battery (1, 2). People use muscle to convert this stored chemical energy into positive mechanical work with peak efficiencies of about 25% (3). This work can be performed at a high rate, with 100 W easily sustainable (1). Many devices take advantage of human power capacity to produce electricity, including hand-crank generators as well as wind-up flashlights, radios, and mobile phone chargers (4). A limitation of these conventional methods is that users must focus their attention on power generation at the expense of other activities, typically resulting in short bouts of generation. For electrical power generation over longer durations, it would be desirable to harvest energy from everyday activities such as walking.



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Customer Based Brand Equity in Relation to Automobile Brands: A Review of Literature

*Mr. Mukesh B. Ahirrao¹, Dr. D. S. Patil²

¹Ph.D. Research Scholar, North Maharashtra University, Jalgaon, M.S., India.

²Assistant Professor, Department of Business Administration (M.B.A.)

SSBT's College of Engineering & Technology, Bambhori, Jalgaon, India.

³Research Guide, Professor & Principal, TES's Art's, Commerce & Science Women College,
Nandurbar, MS, India.

E-Mail: mukeshahirrao1984@rediffmail.com

ABSTRACT: The concept of brand equity first appeared in 1988 and since then, literature of customer based brand equity in general as well as in relation to automobile brands has been significantly contributed by the researchers throughout the world. This research article is based on secondary data and it tries to explore the concept of customer based brand equity and its associated components with special reference to automobile brands. Literature reveals brands association, brand image and brand attitude are widely accepted as statistically significant components of brand equity in relation to automobile brands and leads to brand consideration and brand loyalty.

KEYWORDS: Motorcycle Brands, Two Wheeler, Brand Equity, Brand Awareness, Brand Association, Brand Attitude, Brand Image, Brand Loyalty, Brand, Branding.

Introduction

Over the last 100 years, the process of marketing has been evolved from exchange orientation to today's modern marketing concept through product, production and sales orientation¹. Technology enabled the production in mass quantity and led excess supply of goods in market. This increased the severe competition in market place requiring business firms to differentiate their own products from the competitor's products. As a result, business firms started to create the different identity of their own product. A well differentiated product in the market is called as "Brand" and strategies that are oriented to create such product differentiation is called as "Branding".

Two-Wheeler Industry in India too is not the exception to this shift. Seeds of Two Wheeler Industry in India were planted in 1945 just before the freedom of India from British Rule when M/s Bachelj Trading Corporation Private Limited was formed by Jammalal Bajaj in 29th November. It was the precursor of Bajaj Auto Ltd used to sell imported two-and three wheeled vehicles². The Journey of India's Two Wheeler Industry was started in 1950 when Auto Mobile Products of India was established in New Mumbai by British company Roots Group. The first debut of motorcycle industry in India is accredited to "Lambretta 48" launched by APF Ltd in moped segment³. Later many firms were established to cater the needs of the Indian consumers. Today India is the second largest automobile market in the world after china and largest market in two-wheeler segment.

Indian Two-Wheeler Industry is as well no exception to the competition. During its initial phase till 1981, growth of automobile industry was restricted due to strict government restrictions. Industry was subject to license permit to operate, technology tie-ups with foreign firms and high import duty. As a result, very

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Single Stage Forward-Flyback Converter for Improvement in Performance

Gaurav B. Pait¹, Dr. Parash J. Shah²
PG Scholar¹, Head of Electrical Department²
Electrical Department
SSBT College, Jalgaon, India

Abstract:

In this paper, combining forward and flyback topology converter together by using suitable switching device (i.e. MOSFET) is proposed to obtain better a performance in terms efficiency and power factor of single stage forward-fly back converter. Fly back converter has several advantages over forward converter that they have better power factor but due to higher offset current through magnetizing inductor. Its core loss increases tremendously which results in poor conversion efficiency. On the hand forward converter can obtain high conversion efficiency with low core loss. But input current dead zone near cross AC input voltage decreases power factor. Considering all above aspects proposed converter operates as proposed forward converter for switching on period and as fly back converter for off period. It transfer power over whole switching and achieve better power factor due to fly back converter. Since conventional system having problem regarding offset current. Then this can be reduced by using balanced capacitor. This minimised core loss and volume of transformer. Therefore proposed converter features high efficiency and power factor. To confirm validity of proposed converter, theoretical analysis with control strategy and experimental results are presented.

Keywords: Forward-Fly back, MOSFET, PFC, THD

I. INTRODUCTION

In recent times, for displays and illumination applications light-emitting diodes (LEDs) used on large extent. It just because of LEDs features such as a better efficiency, long life time and eco-friendliness. Therefore, now a day's conventional lighting devices such as a light bulb and fluorescent lamp tend to be replaced by LEDs [1, 2]. There are two types of LED drivers are generally used, that are a linear and switch-mode regulators [3]. Amongst which the linear driver have advantage of a simple circuit configuration, fast transient-response and accurate current regulation, but has serious problem such as a low efficiency and more heat generation. As a result, the switch-mode driver is commonly used in LED applications due to its high efficiency and power density [4, 5]. The drivers for LED lightings have been consist of two power conversion stages (i.e. a power factor corrector and isolated DC/DC converter) [6]. The first stage provides a near unity power factor and low total harmonic distortion (THD) over an whole range of universal input voltage (90-270 V_{rms}) and the second DC/DC stage is used to provide a tight output regulation and galvanic isolation between AC input and DC output. Despite the fact that the two-stage configuration be able to provide the high power factor, good output regulation and excellent ripple voltage, it has a number of major disadvantages such as a large system size, high cost of production and low energy conversion efficiency [8]. For this reason, it is common that the two-stage driver is mostly used for high power applications and single-stage driver is used as a low power LED driver. A rectifier is an electrical device that converts alternating current (AC), which

periodically reverses direction, to direct current (DC), which flows in only one direction. The process is known as rectification. Physically, rectifiers take a number of forms, including vacuum tube diodes, mercury-arc valves, copper and selenium oxide rectifiers, semiconductor diodes, silicon-controlled rectifiers and other silicon-based semiconductor switches. Historically, even synchronous electromechanical switches and motors have been used. Rectifiers have many uses, but are often found serving as components of DC power supplies and high-voltage direct current power transmission systems. Rectification may serve in roles other than to generate direct current for use as a source of power. As noted, detectors of radio signals serve as rectifiers. In gas heating systems flame rectification is used to detect presence of a flame. Because of the alternating nature of the input AC sine wave, the process of rectification alone produces a DC current that, though unidirectional, consists of pulses of current. Many applications of rectifiers, such as power supplies for radio, television and computer equipment, require a steady constant DC current (as would be produced by a battery). In these applications the output of the rectifier is smoothed by an electronic filter (usually a capacitor) to produce a steady current. A more complex circuitry device that performs the opposite function, converting DC to AC, is called an inverter.

II. BASIC CONVERTERS TOPOLOGY

Fly-back converter is the most commonly used SMPS circuit for low output power applications where the output voltage needs to be isolated from the input main supply. The output power of fly-back type SMPS circuits may vary from few watts to less than 100 watts. The overall circuit topology of this converter is considerably simpler than other SMPS.



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RESEARCH ARTICLE

HIGH EFFICIENCY H6 TRANSFORMERLESS TOPOLOGY BASED SINGLE PHASE FULL BRIDGE PV GRID TIED INVERTERS

*Madhuri N.Kshirsagar and Dr. P. J. Shah

Department of Electrical Engineering, SSBT's COET Jalgaon, India

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ABSTRACT

The use of transformerless Photovoltaic inverters is increasing day by day, because of benefits of achieving lower cost, smaller volume, higher efficiency compared to ones with transformer inverters. The transformerless inverters eliminate the leakage current from the circuit. In addition to this, according to international regulations, transformerless inverters should be capable of handling a certain amount of reactive power. In this paper the H6 topology is proposed by using Inverted sine pulse width modulation (ISPWM). The results are compared with traditional sinusoidal pulse width modulation (SPWM). The proposed topology is simulated using MATLAB simulink software.

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INTRODUCTION

Renewable energy technologies are becoming less expensive and more efficient which have the capacity of overcoming the energy crisis. Also power can be produced in close proximity to where it is consumed. This saves the cost of transmission lines. If we compare all the renewable energy sources Photovoltaic is predicted to have highest generation capacity up to 60% of the total energy by end of this century, because the energy which is converted into electrical energy is light from Sun which is free of cost and will still be present for millions of years long after all other non renewable energy sources have been depleted (Blaubjerg *et al.*, 2004). The PV generates direct voltage, thus we require a converter to convert it into ac voltage to feed into utility grid. However there is problem of hazardous voltage that can be avoided by providing galvanic isolation between PV module and grid through transformer. But there are problems in using the transformer. Line frequency or high frequency transformers are used in PV inverters. Line frequency transformers are large and heavy making the whole system bulky and hard to install. High frequency transformers are better in this case, they have lower cost, smaller size, and weight but they have several power stages which makes the system complex which in turn reduces

the efficiency, so transformerless inverters are preferred. But when the transformer is removed, leakage current is introduced in the system and flow through parasitic capacitances between PV panels and the ground (Oscar Lopez *et al.*, 2010). But it causes danger to system, so it must be limited within a reasonable range. This ground leakage current increases the leakage current harmonics and system losses and also creates a strong conducted and radiated electromagnetic interference. So some standard have been established such as VDE 0126-1-1 standard which states that grid current must be disconnected within 0.3 seconds (Mohan *et al.*, 2003). The galvanic connection of the grid and dc sources in transformerless system can introduce additional ground current due to ground parasitic capacitances. These current increases the conducted and radiated electromagnetic emissions, harmonics injected in the utility grid if RMS value of leakage current is more than 30 mA. The half bridge inverter can eliminate the difficulties of leakage current by keeping the common mode voltage constant. But the dc voltage utilization capacity of half bridge is half of full bridge inverter. So full bridge inverters are preferred than half bridge inverters (Chen and Spooner, 2001; Benner and Kazmerski, 1999).

So in the transformerless grid connected PV systems, many topologies have been proposed to eliminate the leakage current such as full bridge inverters, three level neutral clamped inverter, H5 and Highly Efficient and Reliable Inverter Concept (HERIC) topology. The full bridge topology is with

*Corresponding author: Madhuri N.Kshirsagar,
Department of Electrical Engineering, SSBT's COET Jalgaon, India.

A REVIEW OF POWER QUALITY IMPROVEMENT BY USING ACTIVE POWER FILTERS

NehaBhole*

Dr. P. J. Shah**

Abstract

Keywords:

Power Quality
improvement;
Active Filters

This paper explains various power quality problems in distribution systems and its solutions with the help of power electronics based equipment. The equipment such as shunt, hybrid and series active power filters are described showing their compensation characteristics as well as principles of operation. Different power circuits topologies and control scheme for each type of active power filter are studied.

* PG Students, Head, Electrical Engineering Dept. North Maharashtra University, Jalgaon.

DC Line-to-Ground Fault Analysis for VSC Based HVDC Transmission System

Asliwini K. Khairnar

PG Scholar, Electrical Engineering Department
SSBT's College of Engineering & Technology,
Bambhori, Jalgaon.

Dr. P. J. Shah

Head, Electrical Engineering Department
SSBT's College of Engineering & Technology,
Bambhori, Jalgaon

Abstract— Voltage Source Converter based HVDC (VSC- HVDC) transmission technology as a kind of new dc transmission, is attracting more and more research. VSCs are susceptible to transmission line to line fault and line to ground fault. This paper focuses on the transient characteristics of electrical quantities in a VSC-HVDC system after the occurrence of line to ground fault. Equivalent circuit and equation is given to calculate the voltage and current in transmission line. Simulations are undertaken in PSCAD. The behaviors of DC voltage and DC current in faulty transmission line after the line to ground fault is studied. According to the characteristics of the fault current circuit when the line to ground fault occurs, the three stages of fault process were presented in detail. Firstly, DC-side capacitor discharge stage and the voltage of capacitor were derived. Secondly, the state equation of grid-side current feeding stage. Thirdly, the distribution of DC-side capacitor voltage in voltage recovery stage was analyzed. This paper also present a propose protection scheme for transmission line in VSC – HVDC system.

Keywords- VSC, Line to Ground Fault, Fault characteristics, Fault Analysis, protection schemes, PSCAD.

I. INTRODUCTION

The world's first VSC-HVDC transmission was put into operation in 1977 in central Sweden. It is a new DC transmission technology based on voltage source converter, full controlled power electronics device and pulse width modulation [1]. Especially the use of voltage source converter (VSC) based HVDC, which draws on pulse width modulation (PWM) control strategies, has provided a number of benefits compared to the classical HVDC, in terms of enhanced flexibility in independent control of active and reactive power. Hence, VSC-HVDC provides a new choice for grid inter-connection, city center infeed and offshore installation, which is a major breakthrough in the field of power transmission and distribution technology [2]. Because of its large capacity and high voltage transmission characteristics, it is often used for long distance transmission. The DC lines become one of the components with high failure probability in the system, and most common fault is pole-to-ground fault. The analysis of its fault characteristics is of practical significance for the protection of power system security operation [3]. Voltage source converter-based-HVDC (VSC-HVDC) systems are considered to be the technology of choice for efficient grid integration which provides the fast and independent control of active and reactive power flow in both directions, low harmonic generation which enhances the power quality and stability of the system [4]. The analysis of its fault characteristics is of practical significance for the protection of power system security operation.

This paper is organized as follows. In Section II, the DC line faults and the fault process is divided into DC-side capacitor discharge, grid-side current feeding and voltage recovery three stages. In Section III, the accuracy and effectiveness of the fault analysis was validated through a two-terminal DC transmission system which was established in PSCAD simulink. In Section IV, recovery methods are proposed to rebalance the capacitor. Finally, concluding remarks are given in Section V.

High Voltage Direct Current (HVDC) transmission has future scope of bulk power transmission. The transmission losses and the capital investments are eventually higher for AC systems beyond certain distance, e.g., typically about 700km for overhead and 40km for underground lines. Direct connection between two AC systems with different frequencies is rather difficult. HVDC is beneficial in these cases. Moreover, the HVDC systems cause low impacts on the environment compared to the HVAC systems. Integration of renewable energy sources into the grid would be easier using the HVDC system. There are various methods for controlling the HVDC point-to-point transmission system, but the protection system is still lagging behind the AC systems. Fig.1 shows the typical topology of two-terminal HVDC system.

A REVIEW: RECONFIGURABLE SOLAR CONVERTER- A SINGLE STAGE PROCESS

Mr. Rushikesh E. Patil¹

¹ M.E student (EPS),

SSBT's College of Engineering and Technology,
Jalgaon, Maharashtra, India

Dr. P. J. Shah²

Professor & HOD

SSBT's College of Engineering and Technology,
Jalgaon, Maharashtra, India

Abstract: In this Paper introduced a Converter which is called as Reconfigurable Solar Converter (RSC) for photovoltaic (PV)-battery application, particularly utility-scale PV-battery application. The concept of this new converter is to use a Three-phase single-stage grid-tie solar PV converter to perform dc/ac and dc/dc operations. This converter solution is appealing for PV-battery application. This RSC finds wide application in grid connected solar system since it utilizes single stage conversion rather than multistage conversion, reduced losses, low cost, simple in construction, improved efficiency and reduced volume. Combination of analysis is used to demonstrate the attractive performance characteristics of the proposed RSC. SOLAR photovoltaic electricity generation is not available or sometimes less available depending on the time of the day and the weather conditions. When even a small portion of a cell, module, or array is shaded, while the remainder is in sunlight, the output is falls dramatically. Therefore, solar PV electricity output significantly varies. Solar PV electricity output is also highly sensitive to shading. From an energy source standpoint, a stable energy source and an energy source that can be dispatched at the request are desired. As a result, energy storage such as batteries and the fuel cells for solar PV systems has drawn significant attention and the demand of energy storage for solar PV systems has been dramatically increased, since, with energy storage, a solar Photovoltaic system becomes a stable energy source and it can be dispatched at the request, which results in improving the performance and the value of solar PV systems.

Keywords: RSC Converter, energy storage, photovoltaic (PV), solar system, MPPT.

I. INTRODUCTION

Photovoltaic (PV) generation shows a currently one of the most promising and important sources of renewable green energy. For the purpose of environmental and economic benefits, PV generation system is preferred over other renewable energy sources, since they are clean, inexhaustible and require little maintenance. PV cells are generating electric power by directly converting solar energy to electrical energy. PV panels and arrays, generate DC power that has to be converted to AC at standard power frequency in order to feed the loads. The solar cell V-I characteristic is nonlinear and varies with irradiation and temperature. In general, there is a unique point on the V-P or V-I curve, called the Maximum Power Point (MPP), at which the entire PV system operates with maximum efficiency and produces its maximum output power. The location of the MPP is not known, but can be located, either through calculation models or by search algorithms. Therefore Maximum Power Point Tracking (MPPT) techniques are needed to maintain the PV array's operating point at its MPP [5] This PV systems require interfacing power converters between the PV arrays and the grid. Photovoltaic-generated energy can be delivered to power system networks through grid-connected inverters. One critical issue in PV systems is the probable mismatch between the operating characteristics of the load and the PV array. The system's operating point is at the intersection of the I-V curves of the PV array and load, when a PV array is directly connected to a load.

The Maximum Power Point (MPP) of PV array is not attained most of the time. Thus this problem is overcome by using an MPPT which maintains the PV array's operating point at the MPP. MPP occurrence of in the I-V plane is not known priori; therefore it is calculated using a PV array model and measurements of irradiance and array temperature. Calculating of these measurements is often too expensive and the required parameters for the PV array model are not

Enhancement of Power Quality in Grid Connected Photovoltaic System Using Predictive Current Control Technique

Neha Bhole,
SSBT'S COET Bhambhori, Jalgaon,
North Maharashtra University
bholeneha21@gmail.com

Dr. P. J. Shah
Professor of Electrical Engineering Dept.
SSBT'S COET Bhambhori, Jalgaon,
North Maharashtra University
p.j.shah@yaho.com

Abstract—Now-a days the increased use of power electronic devices has resulted in power quality problems such as voltage sag, swell, harmonics and voltage flicker. Non-linear loads affect system power quality. PV systems are grid connected via an interfacing converter. Single phase shunt active power filter (APF) can be used to develop the power quality in terms of current harmonic mitigation and reactive power compensation. In this paper a PV interfacing inverter which acts as a shunt APF is controlled using predictive current control (PCC) technique for current harmonics mitigation. The MATLAB Simulink model is used to study the performance of system.

Keywords-PV system, Power quality, Shunt APF, Predictive current control (PCC), Total harmonic distortion (THD).

1. Introduction

The power quality issues are obtained in power system and one of them is harmonics that influence to a great extent transformer overheating, rotary machine vibration, voltage quality degradation, damage of electric power components, and faulty medical facilities [1]. According to IEEE 519, harmonic voltage distortion on power system 69 kV and below is limited to 5.0% total harmonic distortion with each individual harmonic limited to 3%. The current harmonic limits vary based on the short circuit strength of the system they are being injected into. Essentially, the more the system is able to handle harmonic currents, the more the customer is allowed to inject. The goal of applying the harmonic limit specified in IEEE 519 is to prevent one customer. The intensive use of nonlinear loads, power quality improvement are important consideration and the limitations required by international standards according to IEEE519-1992[2]. These limitations were set to limit the disturbances and escape major problems in electrical power system. Since linear or non-linear single-phase loads are quickly increasing, zero sequence component and current harmonics are produced. This causes overheating of the associate distribution transformers that may lead to a system failure, especially in weak networks [3]-[5].

There is an increase in electric power demand in the world. The energy obtained from conventional sources such as coal is accompanied with environmental pollution. The fossil fuels are non-renewable. So the entire world is looking towards non-renewable sources of energy like solar PV systems, wind energy, tidal energy. These sources of energy are clean, free from environmental pollution and are renewable. These energy sources are used with distributed

Generation (DG). There is also an increase in non-linear loads used in industrial and domestic applications. Non-linear loads affect system power quality such as voltage sag, voltage swell, current harmonics, and voltage flicker. Overheating of transformers, rotary machine vibrations, malfunctioning of electric power equipments and medical facilities, saturations of distribution transformers are the effects of harmonics in system. In order to avoid these effects, the IEEE has imposed certain standards and limitations on the maximum allowable DC currents injected into the grid IEEE 519-1992. The harmonic current can be blocked by using a passive or APF [6]. Passive filter are used due to some advantages such as their simplicity, ease of maintenance and low cost. However, it has several drawbacks like the risk of series and parallel resonances, system impedance dependency and aging effect of the filter passive components. Generally, APFs sort out the classical problems of passive filters [7]. Shunt APF can be used to mitigate both of the line current harmonics and the neutral current in order to improve the system power quality and enhance the grid connection [8]. The single-phase shunt APF uses a predictive current control technique to mitigate of the grid current harmonics as well as improve the power factor.

The suggested control strategy provides a multifunction with a simple controller incorporating phase locked loop, independency, less sensors, ease of practical implementation, and reduced system size and cost. This paper discusses the predictive current control technique of inverter current control to mitigate current harmonics and improve power factor. The MATLAB SIMULINK models used to study the performance of the system.