METHODIST
College of Engineering & Technology
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College Code : 1607

3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the Academic year :2020-2021

Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal
Thermal Performance of Engine Cylinder with Dissimilar Materials	Dr. M Udaya Kumar	Mechanical	International Journal of Advanced Research in Science, Commerce, Management and Technology	Jan-21	ISSN (Online) 2582-9327	http://www.lambert.co.in/Paper123.pdf
Experimental investigation on corrosion behaviour of Friction stir welded AA-T651 aluminium alloy under 3.5%WTNACL environment	Dr.P.Prabhu Raj	Mechanical	Materials today	2021	2214-7853	https://www.sciencedirect.com/science/article/pii/S2214785320362945#!
Stir zone stress corrosion cracking behaviour of friction stir welded AA7075-t651 aluminium alloy joints-	Dr.P.Prabhu Raj	Mechanical	Corrosion review journal- De Gruyter	2021	2191-0316	https://www.degruyter.com/document/doi/10.1515/corrrev-2020-0065/html
Differential Gear Box to reduce vibration using different materials for vehicles -A Review	Prasad Matam, Dr.A. Rajasekhar	Mechanical	TURCOMAT	2021	1309-4653	https://www.turcomat.org/index.php/turkbilmat/article/download/1382/1152
Design and development of servo stabilization system for airborne radar applications	Prasad Matam	Mechanical	Academia Journal of scientific research, USA	2021	2315-7712	https://academiapublishing.org/journals/ajsr/pdf/2020/Nov/Parvathi%20et%20al.pdf

Modelling and analysis of differential gearbox in vehicles	Prasad Matam,Dr.A. Rajasekhar	Mechanical	International journal of Future generation communication and networking	2021	2233-7857	http://www.sersc.org/journals/index.php/IJFGCN/article/view/36582
Increasing Performance of Thermal Processes in Healthcare units under HVAC system: A Critical Review	Dr. M Udaya Kumar	Mechanical	IJARSCMT	2021	ISSN (ONLINE 2582-9327 PP 12-15 IF-5.731	http://www.lambert.co.in/Paper231.pdf
SUPPORT VECTOR MACHINE AND FEATURE SELECTION BASED POTIMIZATION FRAMEWORK FOR BIGDATA SECURITY	Mrs. G Saritha	CSE	IJARET	2020-21	ISSN Print: 0976-6480	https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3800651
Security Implementation to Cyber Physical System by an Innovative Inverse FlipCryp Algorithm	Dr. M. Sharada Varalakshmi	CSE	JSST	2020-22	ISSN 0038-111X Vol. 63 No. 2s (2020)	https://solidstatetechnology.us/index.php/JSST/article/view/4534
Security Implementation to Cyber Physical System by an Innovative Inverse FlipCryp Algorithm	Dr. P.Lavanya	CSE	JSST	2020-22	ISSN 0038-111X Vol. 63 No. 2s (2020)	https://solidstatetechnology.us/index.php/JSST/article/view/4534
Methods and developments in Machine Learning Approach – A Review	Mr. D Rajashekar	CSE	JOICS	2020-24	ISSN 1548-7741	http://www.joics.org/VOL-11-ISSUE-1-2021/
An Experimental Study On The Bond Strength Of Triple Blended Steel Fibre Self Compacting Concrete	Dr.B.L.P.Swami	Civil	High technological letters	Sep-20	ISSN NO : 1006-6748	http://www.gjstx-e.cn/gallery/111-sep2020.pdf
Effect of Metakaolin and Condensed Silica Fume on the Rheological and Structural Properties of Self-Compacting Concrete	Dr.B.L.P.Swami	Civil	Civil Engineering and Architecture Volume 8, Issue 5	Oct-20	ISSN :1057-1062	https://www.hrpub.org/journals/article_info.php?aid=9968
Properties of High Strength Concrete With ballast fiber and Fly ash-An experimental study	Dr.B.L.P.Swami	Civil	High technological letters	Jan-21	ISSN NO : 1006-6748	http://www.gjstx-e.cn/gallery/25-oct2020.pdf

Title	Authors	Department	Journal	Date	ISSN	Link
Hydrological modeling with respect to impact of land-use and land-cover change on the runoff dynamics in Budhabalanga river basing using ArcGIS and SWAT model	Dr.Bandita Naik	Civil	ELSEVIER	Aug-21	ISSN: 2352-9385	https://doi.org/10.1016/j.rsase.2021.100527
A Novel Proficient Secure Routing Strategy In Mobile Ad Hoc Frame Using Heuristic-Based Load Balancing Protocol	T.V. Suresh Kumar, Dr. Prabhu G Benakop	EEE	Solid State Technology	2020	0038-111X	https://solidstatetechnology.us/index.php/JSST/article/view/8923
Direct-driven PMSG based wind energy conversion system with a neutral point clamped grid-side converter	Y Mastanamma, Dr. D Subbarayudu	EEE	The international journal of analytical and experimental modal analysis	2020	0886-93672	https://drive.google.com/file/d/1kHcj2Eo2RfnTT6LaTZc_F93fcmu4ODMm/view
A Secure Routing Protocol for MANET using Neighbor Node Discovery and Multi Detection Routing Protocol	T.V. Suresh Kumar and Dr. Prabhu G Benakop	EEE	International Journal of Engineering Trends and Technology (IJETT) – Volume 68 Issue 7 - July 2020	2020	ISSN: 2231-5381	https://ijettjournal.org/archive/ijett-v68i7p208s
Designing an efficient forecasting routing protocol to secure the mobile ad hoc network communication	T.V. Suresh Kumar and Dr. Prabhu G Benakop	EEE	Bulletin Monumental	2021	e-ISSN 0007-473X	http://www.bulletinmonumental.com/gallery/20-jan2021.pdf
CmosRf Transceiver For Wireless Sensor Networks In Medical Field	Chandrasekhar Kandagatla , Dr. Prabhu G. Benakop	EEE	International Journal of Future Generation Communication and Networking	2021	ISSN:2233-7857	http://www.sersc.org/journals/index.php/IJFGCN/article/view/35909
CMOS Applications and Implementation Procedure of Wireless Multimedia Sensor Network	Chandrasekhar Kandagatla, Dr. Prabhu G. Benakop	EEE	Design Engineering	2021	ISSN:119342	http://thedesignengineering.com/index.php/DE/article/view/8033

Progress in Biomedical Field with an Advancement of CMOS RF Transceiver Using Wireless Sensor Network	Chandrasekhar Kandagatla, Dr. Prabhu G. Benakop	EEE	Design Engineering	2021	ISSN:119343	http://thedesignengineering.com/index.php/DE/article/view/2703
Portable Hybrid Power Bank	Dr. Raghu Chandra Garimella Bhavani Shankar T. Raghavendra Nayak Khethavath	EEE	Australian Patent (Granted)	2020	NA	https://patents.google.com/patent/AU2020100836A4/en?oq=AU2020100836A4
Solar Powered Hybrid Energy Bank	Dr. Raghu Chandra Garimella Bhavani Shankar T. Raghavendra Nayak Khethavath	EEE	Indian Patent (Granted)	2020	NA	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewPDF
Dronebot – A Hexacopter Based Personal Assistant	Dr. Raghu Chandra Garimella Dr. Siva Ramakrishna Madeti	EEE	Australian Patent (Granted)	2020	NA	https://patents.google.com/patent/AU2020102662A4/en?oq=AU2020102662A4
Sensor Operated Automatic Potion (S.O.A.P.) Dispenser	Dr. Raghu Chandra Garimella Radhakrishna Neetoori Pavani Gandreti	EEE	Australian Patent (Granted)	2020	NA	https://patents.google.com/patent/AU2020102940A4/en?oq=AU2020102940A4
Punarupayoga Dhanda Dipa Vyavastha- A System That Illuminates Failed Fluorescent Tube Light Without A Choke Or Ballast	Dr. Raghu Chandra Garimella P. Rajinikanth	EEE	Australian Patent (published)	2020	NA	https://patents.google.com/patent/AU2020102940A4/en?oq=AU2020102940A4
Wireless Monotoring Of Pv Module Characteristics	Dr. Raghu Chandra Garimella P. Rajinikanth	EEE	Australian Patent	2021	NA	http://pericles.ipaustralia.gov.au/ols/auspat/quickSearch.do?queryString=2021103489&resultsPerPage=

Remote Controlled Air Vehicle Based Sanitizing System With Payload Carrier	Dr. Raghu Chandra Garimella Namburi Nireekshan Jarapala Ramesh Babu	EEE	Indian Patent (published)	2021	NA	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus
Microcontroller Based Infinisimal Neutralized Infectious Cide(M.I.N.I. Cide)	Dr. Raghu Chandra Garimella Dr. Prabhu G. Benakop Namburi Nireekshan Jarapala Ramesh Babu	EEE	Indian Patent (published)	2021	NA	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus
Avidyutha Dvichakra Vahana-An Electric Bicycle	Dr. Raghu Chandra Garimella Mr. J. Ramesh Babu Mrs. Y mastanamma	EEE	Indian Patent (filed)	2021	NA	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus
Vidyutha Traya Chakra Vahana-A Hybrid Electrical Cycle	Dr. Raghu Chandra Garimella Mr. J. Ramesh Babu Mrs. Y mastanamma	EEE	Indian Patent (filed)	2021	NA	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus
Abhigna Vidyut Samputah- A Smart Electric Extension Box	Dr. Raghu Chandra Garimella Mrs. Y mastanamma Mr. J. Ramesh Babu	EEE	Indian Patent (published) Australian (filed)	2021	NA	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus
Bitti Astita Nagarata Nistantri Samvidha - A Wall Mounted Smart Wiring System	Dr. Raghu Chandra Garimella Nane Swarnadh Satapathi Mrs. Y mastanamma	EEE	Australian (Granted)	2021	NA	http://pericles.ipaustralia.gov.au/ols/auspat/quickSearch.do?queryString=2021106337&resultsPerPage
Parinata Vidyut Samyutanam- An Advanced Electric Extension Box	Dr. Raghu Chandra Garimella Nane Swarnadh Satapathi Mrs. Y mastanamma	EEE	Australian (Granted)	2021	NA	http://pericles.ipaustralia.gov.au/ols/auspat/quickSearch.do?queryString=2021104789&resultsPerPage
Unnamed Aerial Vehicle (Uav) Based Sanitizing System	Dr. Raghu Chandra Garimella Namburi Nireekshan	EEE	Australian (Granted)	2021	NA	https://pericles.ipaustralia.gov.au/ols/auspat/quickSearch.do?queryString=2021106335&resultsPerPage=

Studies on 4 - dimethylaminopyridinium salicylate monohydrate's optical, mechanical, and laser damage threshold	A. Arun kumar,	Department of Physics	Solid state communications	2021	0038-1098	https://doi.org/10.1016/j.ssc.2021.114347
'Synthesis, Growth, Structural, Spectral and Optical studies on 2-amino-4-picolinium 4-hydroxybenzoate single crystals Volume 47, Part 14, 2021, Pages 4772-4777.	Dr.A.Arun kumar	Department of Physics	Materials Today Proceedings	2021	2214-7853	https://doi.org/10.1016/j.matpr.2021.05.679
'Organic piperazine p-nitrophenol (PPN) single crystal growth and characterization', , Volume 47, Part 14, 2021, Pages 4741-4745.	Dr.A.Arun kumar	Department of Physics	Materials Today Proceedings	2021	2214-7853	https://doi.org/10.1016/j.matpr.2021.05.663
'Nucleation, Dielectric, And Ferro Electric Studies of Potassium Succinate- Succinic Acid (KSSA) Crystals, , Volume 47, Part 14, 2021, Pages 4852-4860.	Dr.A.Arun kumar	Department of Physics	Materials Today Proceedings	2021	2214-7853	https://doi.org/10.1016/j.matpr.2021.06.083
Investigation of Electrical Properties of Pure and Thallium Chloride Doped Poly Vinyl Alcohol Polymer Electrolyte Films	Dr. K.Anuradha Reddy	Department of Physics	Indian Patent (published)	2021	202141004475A	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus
A Common Fixed Point Theorem For Compatible Mappings Of Type (C)	Dr.Swathi Mathur	Mathematics	Indian Patent (published)	2021	202141006283 A	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus
Synthesis, Crystal Structure, Spectral And Thermal Properties Of 4-Dimethylaminopyridinium Salicylate Monohydrate	Dr.A.Arun kumar	Department of Physics	Indian Patent (published)	2021	202141034416 A	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus

Growth, Structural, Thermal, Optical, And Electrical Properties Of Potassium Succinatesuccinic Acid Crystal	Dr.A.Arun kumar	Department of Physics	Indian Patent (published)	2021	202141033202 A	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus
Creating A Self-Assessment Tool For An English-Language-Teacher And Its Implementation	I.V.Sona Lakshmi and Ms. J. R. Hephzabah	English	Indian Patent (published)	2021	202141037269 A	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus
Estimation of Number of Levels of Scaling the principal Components in Denoising EEG Signals	Dr.B.Krishna kumar	ECE	Biomedical and Pharmacology Journal	Mar-21	ISSN:0974-6242 e-ISSN:2456-2610	https://dx.doi.org/10.13005/bpj/2142
Risk Factor Analysis of COVID-19	Dr.John William Carey M	ECE	International Journal of Current Research and Review	Nov-20	ISSN:2231-2196,ISSN: 0975-5241	http://dx.doi.org/10.31782/IJCRR.2021.13208
Effect of Sampling Frequency on SNR in the Removal of Ocular Artifacts in EEG Signals using Wavelets	Dr.B.Krishna kumar	ECE	i-manager's Journal on Digital Signal Processing(JDP)	Jun-20	2322-0368	https://doi.org/10.26634/jdp.7.3.17343
Effect of Bright Light on EEG Ocular Artifacts	Dr.John William Carey M	ECE	International Journal of Control and Automation	Jul-20	2005-4297	http://sersc.org/journals/index.php/IJCA/article/view/6414
Framework Design and Simulation of VANET Vehicle Positioning using Two Stage Sigma Point Kalman Filter (TSSPKF)	Dr. Ravi M Yadahalli	ECE	International Journal of Grid and Distributed Computing	2021	ISSN: 2005-4262IJGDC	http://sersc.org/journals/index.php/IJGDC/article/view/36953
Parametric Study of Ring Coupled and Strip Connected Ring Coupled With Different Orientations for Wireless Multiband Applications	Dr. Ravi M Yadahalli	ECE	Design Engineering	2021	ISSN: 0011-9342	https://www.thedesignengineering.com/index.php/DE/article/view/4164

Short time Contact bell push switch	Dr. Ravi M Yadahalli	ECE	Indian Patent (published)	2021	202141042248 A	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus
Foot operated hand sanitizer	Dr. Ravi M Yadahalli	ECE	Indian Patent (published)	2021	202147033693 A	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus
Hand Held UV Light santizer	Dr. Ravi M Yadahalli	ECE	Indian Patent (published)	2021	202111027089A	https://ipindiaservices.gov.in/PatentSearch/PatentSearch/ViewApplicationStatus

Criteria Incharge

Principal

Thermal Performance of Engine Cylinder with Dissimilar Materials

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Abstract: *The engine cylinder is subjected to rapid changes in temperature due to combustion of air and fuel mixture inside the cylinder; so fins are provided on the cylinder which increases the heat dissipation rate. The medium used for heat dissipation is air. Though the dissipation rate of heat can be improved by enlarging the surface area of engine but designing such complex engine is difficult and it requires more space. Hence fins are used which provide additional surface area to cool down the engine. Fins used for engine cylinder might be of different materials depending upon the heat transfer rate. The commonly used material for fins is Aluminum but other materials can also be used in place of it depending upon the heat transfer rate required. In the present work, three different types of materials for fins and carry a thermal analysis on three of them by using varying geometries, altering thickness of the fins and the distance between them. The materials used are Aluminum Alloy with Aluminum percentage 92, 94 and 96.The rest composition includes the percentages of copper, magnesium and tin.*

Keywords: Fins, Heat dissipation, Thermal Analysis, Engine Cylinder, Materials

I. INTRODUCTION

Engines are of two types, they are External and Internal Combustion Engine. If the air-fuel ratio is combusted within the engine cylinder then it is termed as Internal Combustion Engine. In an external combustible engine mixture is heated inside from an external source. As a result, hot gases are produced which could result in temperature about 2300-2500°C which is very high and could damage the engine if not dissipated. So, this temperature should be bought to about 140-200°C to make the engine work efficiently. Cooling more than required is not desirable because it tends to decrease the thermal efficiency of the engine. So a system of cooling is incorporated to reduce the temperature and allow the engine to function effectively. Engines produce mechanical energy by extracting energy from flows, same as that of a water wheel extracting energy from mass of stream which falls from a distance. The heat that is wasted will be removed by cool air; while hot gases are exhausted the result is cooling of the engine. Engines which perform high have greater energy as mechanical movement and have fewer heat wastes. A little waste heat is required: it guides heat thru the engine, tons as a water wheel works only if there may be some go out speed (energy) in the waste water to hold it away and make room for more water. For that reason, all warmth engines need cooling to perform. Cooling is likewise wanted because excessive temperatures harm engine materials and lubricants. Engine cooling gets rid of power rapid enough to preserve temperatures low so the engine can continue to exist. The cooling of engine takes place in two ways in an Internal Combustible Engine. They are air-cooled and liquid cooled. Marine engines and a few stationary engines have prepared to get admission to a immense volume of water at a suitable temperature. If water is used as a coolant to chill the engine, it could clog coolant passages due to sediments or can damage the engine due to salt reaction with water.

II. LITERATURE REVIEW

Charan et. al. [1] analyzed extended surfaces, which are commonly used to enhance convection heat transfer in a wide range of engineering applications. The conception of introducing perforations on the lateral surface of fin is to enhance heat transfer rate effectively. From the research, it is evident that tip temperature is minimum for aluminum triangularly perforated with three perforations in it and heat transfer is maximum for triangularly perforated with three perforations of aluminum material.

Experimental investigation on corrosion behavior of friction stir welded AA7075-T651 aluminium alloy under 3.5% wt NaCl environment

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ARTICLE INFO

ABSTRACT

The corrosion resistance of high strength heat treatable aluminium alloy is able to form an oxide film on its surface. In aggressive corrosion media, the oxide film can undergo corrosion responses in chloride-containing environments. The welding of AA7075 is important for advanced structural application in aircraft and automotive industries. Friction Stir Welding (FSW) method is the new technique and a sound welding method in the aluminium industry, which overcomes solidification cracking problem compared to the conventional fusion welding technique. Rolled plates of 10 mm thickness of AA7075-T651 were butt welded by using FSW process. The corrosion surface morphology and behaviour were investigated by conducting a salt fog test in sodium chloride solution at various spraying time, chloride ion and pH value. An objective was initiated to extend an experimental relationship to predict the corrosion rate of stir zone of FSW AA7075-T651 joints. Three factors five levels of a centre rotatable matrix was used to reduce the number of experimental circumstances and response surface methodology was used to develop an empirical relationship between salt fog variables. The empirical model can be used to predict the corrosion rate of FSW AA7075-T651 joints.

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1. Introduction

Aluminium alloys are generally used in aircraft industries, missile parts, all-terrain vehicle sprockets and military vehicle manufacturing industries owing to high strength to weight ratio, easily formable and excellent machining performance. Al-Zn-Cu-Mg alloy has generally resistance to pitting corrosion due to the formation of adherent oxide film [1]. The choices of welding methods for its further applications are important. The aluminium alloys are joined by conventional welding method. But, the joint strength was poor. Weld zones naturally generate coarse columnar grain structure because of the predominant thermal circumstances during weld pool solidification. These can results in inferior tensile properties and susceptible hot cracking. Further, in fusion welding of 7××× series alloys, it undergoes various defects, such as electrode inclusion, porosity, solidification cracks etc. which weakens

the weld quality and mechanical properties. FSW has been an ideal process for the joining of heat treatable aluminium alloys since 1991[2]. It was developed as a solid state welding method with important application in the aircraft industries. It was extended in welded joints being used in defense vehicle and architecturally demanding applications [3,4].

The FSW process overcomes the issue of solidification defects and distortion in the weldments which are often associated with fusion welding processes [5]. FSW joints usually include of four different regions such as stir zone (SZ), thermo mechanical affected zone (TMAZ), heat affected zone (HAZ) and unaffected zone respectively. The stir zone microstructure was fine and equiaxed grains were normally finer than the parent material grain size [6].

The metallurgical properties of FSW of aluminium alloys have attracted significant research interest, whereas, the many researchers were not yet explored corrosion behaviour of FSW joints. In 3.5 wt% sodium chloride solution, the corrosion behaviour of aluminium alloys does not depend on their major alloying elements, but exclusively on the pH of the solution. Heat treatable

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Original article

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Stir zone stress corrosion cracking behavior of friction stir welded AA7075-T651 aluminum alloy joints

Abstract: AA7075 high-strength aluminum alloy, which has many applications in the aircraft, marine and automobile industries, happens to be susceptible to stress corrosion cracking (SCC) when exposed to corrosive environments, resulting in reduced service life of the components. Inappropriate fabrication processes may augment this behavior. The fabrication of AA7075 components using conventional fusion welding processes may produce defects that include hot cracking and porosity. Friction stir welding (FSW) is a solid-state joining process that can avoid these problems and being widely used for components made of aluminum alloys. Because the joining occurs at a temperature that is lower than the melting point of the material, solidification cracking defects can be eliminated. This study investigates the SCC behavior of FSW AA7075-T651 joints. Horizontal-type SCC test was conducted on circumferential-notched tensile (CNT) specimens exposed to 3.5 wt. % NaCl solutions under various axial stress conditions. The different regions of the fractured specimens, such as the machined notch, SCC region and region of ultimate mechanical failure were analyzed by scanning electron microscopy (SEM) to establish the mechanism of SCC. The threshold stress of parent metal (PM) and stir zone (SZ) of the FSW joint were found to be 242 and 175 MPa, respectively.

1 Introduction

High-strength aluminum alloys are generally used in aerospace components, automotive vehicle sprockets, defense and naval applications owing to their high specific strength, easy machinability, and good formability, high strength-to-weight ratio and corrosion resistivity (Rajakumar et al. 2012). AA7075-T651 aluminum alloy (Al–Zn–Cu–Mg), a useful low temperature alloy, has superior corrosion resistance due to the adherent oxide film on its surface (James et al. 2003; Singh et al. 2011). Friction stir welding (FSW) is an ideal process for joining 7075 series aluminum alloys as, unlike conventional fusion welding processes, it is less susceptible to causing porosity, hot cracking and distortion of the weldments. It was developed as a solid-state joining method with significant application in various manufacturing industries and has resulted in welded joints being used in defense and automobiles applications (Çam et al. 2017; Rhodes et al. 1997).

FSW joints normally comprise four different regions: unaffected parent metal (PM), heat-affected zone (HAZ), thermomechanically affected zone (TMAZ) and stir zone (SZ). The features and extent of these regions depend on the flow behavior of the deformed material under the action of non-consumable tool rotation. The weld nugget microstructure composes of equiaxed grains that are significantly finer than the PM. The frictional heat developed during FSW, softens the material around the tool. In addition, the tool shoulder generates additional heat which plasticizes the material. The rotating tool transfers the softened material around the tool pin. Thus, the SZ experience high plastic deformation and recrystallize. Appreciable changes in the SZ microstructure

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Differential Gear Box To Reduce Vibration Using Different Materials For Vehicles-A Review

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Abstract: Whatever framework is embraced to coordinate the automobile to its thought process unit — be it a hand shift gearbox, a 'hot' shift gearbox or completely automatic unit, a complex and generally expensive mechanism is ordinarily included. More than expected plan office consideration is centeredaround this region of a recently imagined vehicle. Grounded plan systems for transmission gearing were accessible before the principal automobile or even the inner combustion motor was created; solid answers have in this way been generally accessible from the planning phase. The intricacy of the mechanisms has additionally requested, on account of amount delivered vehicles, thorough drawing designs of the variety of segments included with the goal that resilience stacking can be read and the requirement for exceptionally talented fitting, during get together, decreased. The present-day meaning of the creator's commitment is additionally improved by the need to guarantee without a doubt the base of expensive turn of events or creation changes. The cautious determination of gear ratios for a manual unit, or of control boundaries in an automatic one, can drastically influence the presentation or driveability of the completed vehicle.

Introduction

With numerous points of interest, for example, tight structure, high efficiency and stable speed proportion and so on, gear train has been generally utilized in numerous mechanical fields. At the point when the gear reducer is running, gearbox vibration is produced, because of the impact of the gear pair dynamic lattice power, which not just influences the soundness of the transmission framework, yet in addition creates commotion. What's more, inordinate commotion delivered by a reducer causes group exhaustion, stressed correspondence, and conceivable hearing harm. To guarantee a calm, smooth, and safe activity of a gear transmission framework, it is important to comprehend mechanisms of the powerful reaction and clamor radiation of the gear reducer, then, their decrease is profoundly wanted.

With the expanding interest for calmer gear frameworks, a lot of work has been accounted for in the writing on examining the vibration and commotion of the gearbox. Mohamed et al. constructed the gearbox vibro-acoustic framework by utilizing a three-dimensional limited component (FE) approach, and the acoustic reaction of the framework was assessed. Velex and Maatar processed the unique reaction to work solidness variety for mathematical gears. Their outcomes showed the effect of lattice firmness minor departure from dynamic reaction and tooth loads. Jean et al. built up a trial and mathematical investigation of dynamic marvels including gear impacts with one free gear inside an auto gearbox. Barthod et al. managed the clatter clamor, brought about by variance of the motor force under unique conditions, which could cause different effects inside the gearbox. Kato et al. mimicked the vibration and commotion radiation of a solitary stage gearbox by joining limited component (FE) vibration investigation with limit component clamor examination. The aftereffects of this examination very much concurred with the comparing estimated information. Spike and helical gears were tried in the NASA gear-commotion apparatus to analyze the clamor created by various gear plans. Valuable decisions about the impact of the gear plan boundaries on gearbox emanated clamor were drawn.

Literature Review

Portal axle is a superior trade for typical back tire hub in rough terrain driving conditions. It is intended to give more ground leeway to the differential unit. Prod gears are displayed and mimicked to discover its dynamic conduct. Modular examination was done on three diverse mix of gear trains in the gearbox utilizing FEM under both pre-stress and free pressure conditions. Through modular examination reverberation qualities of a construction can be anticipated. Mass and firmness of a framework impacts the general unique reaction of a framework. Initial six mode shapes and eight regular frequencies were found. Nobody characteristic recurrence coordinated with working recurrence. Modular examination of mechanical framework permits forecast of characteristic frequencies and relating mode shapes. Firmness of a design changes as indicated by the heap variety. Modular examination was done in effect pound under various stacking conditions with shifting cross section solidness.

Normal recurrence increments with increment in burden. AnkurSaxena et al have researched the impact of lattice solidness on mode shapes and normal frequencies of geared rotor framework. Modular investigation includes

Research Paper

Design and development of servo stabilization system for airborne radar applications

ABSTRACT

This study presents the design and development of servo stabilization system for airborne applications in specific missile and radar applications.The main objective was to study the stability of the loads and structural analysis of the Servo Stabilization system. The major significance of this design is to withstand the payload with respective to dynamic conditions. To initiate this approach, several methods were applied to achieve better performance. Geared Servo Mechanism, Linkage Mechanism, Direct Drive Mechanisms each have their own advantages and disadvantages.The geared servo systems had a minimum back lash among them. If the LOS angle disturbs, it will lead to reduction in the tracking accuracy. Based on the practical experiences and literature survey, Direct Drive stabilization was selected and analysis carried out to meet the specifications. Direct Drive servo system was preferred for the project to avoid the back lash of the gears. The servo stabilization system contains Mechanical components like linkages, Payload carrier (Antenna Servo interface Plate), bearings etc., Electrical components like BLDC Motors and Drivers. The feedback sensors were selected based on the accuracy which plays a key role in the tracking. Before realizing the hardware implementation, a full scale CAD model had been developed in solid works and analysis process done for structure using Ansys. The main concentration on Antenna servo interface plate which has a high severity to withstand the particular load as per the design thickness 2mm was maintained for aluminum which was not satisfactory. To increase the stiffness of the system, different material were chosen like EN 24 and EN8 for the analysis to satisfy the responses. The study is organized as follows, it begins with the introduction and design specifications of the system; explores the selection of servo Mechanism and material and design considerations; Design Methodology; and finally ended with results and conclusion.

Key words: Servo stabilization, gimbal, azimuth, elevation, direct drive, gear mechanism, linkage, pivot, payload, bulk-head, los, backlash, tracking accuracy, angular freedom.

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INTRODUCTION

The Main purpose of this study is to design and realize the concept of high precision mechanics and selection of the right components for the selected mechanisms. For the study of the servo stabilization system, the following mechanisms are considered

(1)Gear Mechanism
(2)Direct Drive Mechanism
(3)Linkage mechanism

The Selection of components was done based on calculations and analysis of the different components in the systems.

Approach 1: Using theoretical calculations
Approach 2: System engineering and modelling

In airborne radar systems, fast responding angle tracking servo stabilization is required to counter high velocity and maneuverable targets, but in conventional systems(geared or linkage), the mechanical inertia is more likely to move the payload. Hence, we move forward with futuristic direct

Modeling And Analysis Of Differential Geear Box In Vechicles

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Abstract

The differential can be expressed as a gear train used to control the speed and torque to the rear wheels. While proceeding, the fundamental necessity of the vehicle is to control the speed of rear wheels with the goal that the vehicle turns easily on road surface. The differential basically comprises of three shafts and gear train plan. The main shaft is propeller shaft which gives the need torque and speed to differential for turn. The other two shafts are hub shafts mounted for each rear wheels. These shafts are joined to propeller shaft by crown gear and pinion game plan in this way making a slope pair of gears. The two fundamental pieces of differential transmission system, one is crown gear which gives suitable speed to turn the vehicle and another is pinion which gives permissible speed and torque to turning the vehicle. Hence, the analysis of such crown gear and pinion makes need for strength. The principle objective of this paper is to perform mechanical plan of differential gear box and analysis of gears in gear box. We have taken dark cast iron and aluminum compound materials for leading the analysis.

Introduction

At the point when the vehicle is proceeding onward a road and when it takes a turn both the outside and inside wheel need to travel distinctive distance so here the differential gearbox comes into job. The transmission system utilized in the vehicle contain a segment which is utilized to move power from propeller shaft to both the wheels is called as differential. It is a gathering of gear in an epicyclic train which grant the rotation of two shaft at two diverse speed, utilized at the rear side of the vehicle to turn the wheel quicker than the other. The differential is utilized twoly, one is that it gets an information and makes two yields while other is that It gets two data sources consolidated it and gives one yield. The differential is situated in the middle of the two-rear wheel of the vehicle to turn one wheel quicker than the other. At the point when the vehicle goes ahead, the inward wheel covers less distance than the external wheel, so it implies the speed of internal wheel must be not exactly the external wheel. Be that as it may, when the vehicle goes straight both the wheel turn at a similar speed. To give both the condition differential gearbox is utilized.

At the point when the vehicles one wheel is in mud, snow, potholes or stuck to the snag the two issue is that the wheel which is stucked rotates double the typical speed while the other wheel is fixed. This is because of the wheel which is stucked has sufficient foothold power acting to the road surface. To stay away from this issue the improvement in the gearbox is to be done and the answer for have differential locking system which give commitment or separation. The plan of the differential impact on the disappointment of the differential. As it makes with the gathering of the slant gear it is useful for taking heap of the vehicle. Along these lines, the improve the general differential and to stay away from disappointment because of loading.

Literature Review

Ronak P Panchal and Pratik B Umrigar talked about the qualities of a bevel gear in a unique conditions including fitting solidness and different burdens produce are examined. By utilizing a mathematical

Increasing Performance of Thermal Processes In Healthcare Units Under HVAC Systems For Energy Saving: A Critical Review

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Abstract: *Healthcare units consume outsized amount of energy, in the present day scenario. Within developed countries, the energy utilization of healthcare units may reach up to 16% of the overall energy usage in profitable sectors. In this study the maximum energy consumers in South African healthcare units are well-known and approximate energy-efficacy initiatives are proposed, in terms of performance, operation and technology .Two thermal energy systems are identified heating, ventilation and air conditioning and water-heating systems .At each level, energy-efficacy initiatives are introduced based on potential energy savings and the effort required to achieve these savings. In addition, model predictive control approaches are discussed and reviewed as part of the further improvement section. Average may possibly energy savings ranged from 46%–65% at the base level, while energy savings of 16%–31% may possibly be expected for energy-efficacy initiatives at the active level. Energy efficacy activities at the technical level and the further improvement level may result in savings of 45%–70% and 6%–12%, respectively.*

Keywords: Energy saving, Efficiency, thermal process, Energy management, renewable energy

I. INTRODUCTION

Pérez-Lombard, L et.al studied that [1,2], the energy consumption of commercial buildings in developed countries ranges from 8%–18%, Healthcare units are the fifth highest energy consumer in the commercial sector, in terms of energy consumption. Additionally, it was observed that the energy consumption of healthcare units ranges from approximately 43–92 kWh/bed/day. Eberhard, A et.al stated that [3]. In order to reduce the impact that electricity costs have on healthcare expenses, energy-intensive systems need to be effectively managed in terms of energy efficacy. A huge body of research with the explicit objective to enhance energy efficiency of particular systems in buildings has been conducted, particularly in the past two decades . Amowine, N et.al observed that [4,5]. However, a comprehensive review of scientific articles on energy-efficiency initiatives in healthcare units are currently lacking, substantiating the need for such a review. Therefore, the aim of this research is to conduct a review using a well-established energy-management systems Javied, T et al [6]. The first stage incorporates energy policy and planning with the aim of obtaining an initial energy baseline, energy performance indicators, strategic and operative energy objectives and action plans. Prashar, A et.al [7]. Explored that the Plan do check act (PDCA) model has beneficiary of being a powerful, to resolve new and recurring issues in any industry.

Van Heerden, et.al [8]observed that, another major drawback, similarly as a consequence of the circular paradigm and the step-by-step process, is the limitation placed on radical innovation. Therefore, the PDCA model has its focus on correcting mistakes rather than preventing it. Consequently, the time required to implement a program with the best possible outcome, in this case, maximized energy efficiency , is increased substantially

II. ENERGY EFFECTIVENESS BASED ON THE RECITAL, OPERATION, EQUIPMENT AND EXPERTISE STRUCTURED WORK

Hoexter, M.F et.al studied that [9] The sustainability of an energy-management program for the improvement of energy efficiency may be evaluated by considering the three aspects; organizational structure, compatibility of performance indices and engineering support A well-designed organizational structure supports the sustainability of an

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SUPPORT VECTOR MACHINE AND FEATURE SELECTION BASED OPTIMIZATION FRAMEWORK FOR BIG DATA SECURITY

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ABSTRACT

As the Internet is rising at a rapid pace, cyber attacks have also increased as a result. There is a rapid rise in the form and rate of incidence of these attacks. There are several conventional security solutions that exist, but in the case of big data, these solutions do not work well. Instead of conventional Processes, shielding big data from attacks requires a different approach. The spark tool is used in this article and it has several advanced features, such as parallel data processing. Some inbuilt machine learning algorithms are included in its library. The dataset used is NSL KDDCUP, the scale of which is MBs. This dataset is ideally suited as a test case for big data. An approach is suggested for intrusion detection, i.e., SVM classifier is used and a new form of approach called Pareto fronts multi objective genetic algorithm is used to pick features.

Keywords: Big data, Security, Intrusion Detection System, SVM

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1. INTRODUCTION

Now everyone uses the internet in round the clock. The enormous amount of information is created, manipulated and stored every second through the use of the internet. This data can be or can be even more in megabytes, terabytes, and zettabytes. This is referred to as Big Data. As the term suggests, it is related to information size, but not just questions about data size in real Big Data. There are three features of Big Data. "They are referred to as" Big Data 3 V's.

Security Implementation to Cyber Physical System by an Innovative Inverse FlipCryp Algorithm

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Abstract--- As the communication framework has a vital influence on the world, security has become a significant concern. The Cyber Physical System (CPS) has become an integral part of present day society and most of the infrastructures are constrained by these frameworks. Two fundamentally significant parts of these frameworks are being safe and secured. This research paper manages the security issues of the data framework in a Cyber physical Systems. An Inverse FlipCryp(I-FlipCryp) method has been designed and developed for securing the storage information of the CPS.

Keywords--- Cyber Physical Systems (CPS), Inverse FlipCryp(I-FlipCryp), Security.

I. Introduction

Digital physical framework is the popular expression in the business today. CPS is a combination of sensors, actuators, control units and algorithms. CPS has characters, for example, sheltered, solid, constant, execution and so forth. The security in CPS can be isolated into two classes 1.Information Security-chiefly centers around encryption of information. 2. Secure Control Theory-clarifies how digital assaults influence the control frameworks.

Data Security mostly centers around encryption of information gained by the Cyber Physical System. The information obtained by the CPS is put away in the data framework. In contrast to conventional PC security, the information in the CPS is gotten to by all degrees of individuals. In this way it is imperative to give extra security to the information in CPS with the end goal that the malignant assaults can be kept away from. The entry of information by the unapproved clients might be limited. The security to data framework in CPS is moderately new and more spot light is required on ensuring the information.

II. Literature Survey

The need of security for CPS is complex. Elements for security are:

1. Privacy: CPS is utilized in business applications like clinical information [J.Han.et.al,

Methods and Developments in Machine Learning Approach – A Review

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Abstract: *The development in the area of machine learning is outlined in this paper. Machine learning has evolved as a new solution in outcome new and accurate decision in large data processing. The learning approach has a significant need in the upcoming applications, where a large learning data are to be processed in developing a decision. The field of automation in various applications ranging from data retrieval, medical application, military applications, security and authentication issues, astronomical data processing etc. was developing new interface and solutions for accurate and efficient mining. This paper outlines the development in the area of machine learning techniques using various learning approaches such as the neural network, classification approach, decision approach were presented. Machine learning approach is used as a mode of operation in developing solution based on training and testing process, where learning details such as the descriptive features and different predictive analysis algorithms in developing the best match decision. Wherein, evolution the area of machine learning has outcome with numerous approaches with the objective of faster and accurate learning system, the need of improvement in the monitoring factor is yet needed. The constraint of machine learning stand in two fold, wherein the complexity and data representation are to be kept lower, the demanded accuracy is higher. The evolution and constraint to the existing machine learning approaches were outlined in this paper.*

Index Term: Machine learning, Learning and decision system, review.

I. INTRODUCTION

Retrieval of information from a large dataset is a critical task in various automation applications. The demand of building the existing approach automated increases the effort on machine learning for present and future applications. The recent developments in the area of machine learning have developed in deep learning [1], Bayesian modeling [2], non parametric processing [3] etc. The increase in the volume of data in the registered data base has increase the demand for new machine learning approach, where a large signaling request and data accessing. With the evolution of machine learning, new techniques to make the process faster and efficient is been focused. With evolution of new architectures and network layout, the distribution of data is not confined to a specific location, but to maintain a large distribution of data units are distributed over a wide network communicating each other to deliver the data. In the evolution, new topology such as the cloud computing [4], distributed computing [5], heterogeneous network [6] have evolved. Machine Learning (ML) methods developed as a learning system in data interface, has shown a significant improvement in offered services and data performance, however these approaches has a constraint of high computing overhead, false decision under semantic conditions, and higher latency issue in data exchange [7].

Machine learning is developed as a synonym to human learning system. The approach predicts the observation and makes decision based on the past learning. The data acquisition and processing is a major part of a machine learning system. The development of machine learning system has a critical usage of data updation which can be developed online or

AN EXPERIMENTAL STUDY ON THE BOND STRENGTH OF TRIPLE BLENDED STEEL FIBRE SELF COMPACTING CONCRETE

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Abstract

        The article deals with the experimental investigation on the bond strength for the triple blended steel fiber self-compacting concrete (TBSFSCC),and its variation with the percentage of the steel fiber content. Self-Compacting Concrete (SCC) is designed with the mineral admixtures such as micro silica, and flyash as supplementary cementitious materials(SCM's). These SCMS are used as the additives for SCC at 10 and 20 percentages respectively for the partial replacement of cement, to fulfil the norms of the SCC as per ACI specifications. The embedment length of steel bar of diameter 12mm, was fixed as 100mm length in all the standard specimens. The Fe-415 grade of the steel rebar is used in this experimentation. The bond strength of this triple blended Self-Compacting Concrete (TBSCC) is evaluated by pull-out test in the universal testing machine. Later, the ordinary steel fibres are added to the volume of the concrete at various percentages like 0.2, 0.4, 0.6,and 0.8. For each rebar the test results for the bond strength along with slip, and mode of the failure were recorded. The comparison of these results clearly indicates that the contribution of the steel fiber percentage on the bond strength of the TBSCC and the conclusions are drawn.

KEY WORDS: Self-Compacting Concrete, Triple Blended, Micro Silica, flyash, Steel fibers, Bond Strength, Pull-Out test, Slip of rebar.

I.INTRODUCTION

        Wherever compaction of the concrete is not practically feasible, the concept of the Self-Compacting Concrete will be used. SCC was developed in Japan by Okamura and Ouchi [1], later Ozawa, and Nan-Su [2,3] have given very significant encouraging results in this type of concrete. Rebar slip is one of the main reasons for the failure of the concrete structural element. This may occur due to corrosion of the embedded steel rebar, or loss of the bond strength of the concrete with this rebar. The behaviour of the concrete structural elements like beam, columns is dependent upon the bond between the concrete and rebar used in it as reinforcement. The Bond strength is the resistance against the tangential shear developed between the concrete and rebar in it. The magnitude of this bond strength is dependent upon the denseness of the concrete (grade of the concrete), type of the rebar used in it as reinforcement. When fibers are used in this grade of the concrete; it will become more stiff and dense. Because of this in the concrete composite the bond strength is enhanced and this depends on the percentage of fiber, its geometrical and physical properties. Several researches have already used various types of fibers in the normal vibrated concrete (NVC), for evaluation of the bond behaviour, and mode of failure. The novelty of the present work is to study the behaviour of this bond strength for the triple blended Self-Compacting Concrete, in which the steel fiber of different percentages and optimum aspect ratio was adopted. The bond between the rebar of 12mm HYSD (high yield strength deformed), and the concrete in the structural elements influences in many aspects, such as the strength of the lap splices in

Effect of Metakaolin and Condensed Silica Fume on the Rheological and Structural Properties of Self-compacting Concrete

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Abstract This article deals with the comparison between the metakaolin and condensed silica fume contributions in the flyash based self-compacting concrete (SCC). Self-compacting concrete with mineral admixtures like flyash and condensed silica fume is prepared by cement replacing partially at 20 and 10 percentages respectively. M40 grade of the concrete was designed by adjusting the ratio of the fine aggregate to the total aggregate volume to fulfill the requirements of the SCC. Another M40 grade of SCC is designed with the flyash and metakaolin as the mineral admixtures with the same percentage of replacement for cement by mass. Rheological properties are examined as per EFNARC specifications for flowability; passing ability and segregation resistance for both the triple blended self-compacting concretes (TBSCC). For getting the required flowability of concrete and for modifying the viscous nature of the concrete, superplasticizer and viscosity modifying agents are additionally added to the concrete. The structural properties like compression and split tensile strengths of the specimens are recorded by conducting the standard tests. By comparing the strength results, it is concluded that metakaolin and silica fume have only marginal changes between them in the rheological as well as the mechanical properties of the triple blended self-compacting concrete.

1. Introduction

Compaction of the concrete has a very significant role in obtaining the required strength of the concrete. But in the fabrication of thin concrete structural elements, the compaction is too difficult, and also for placing the fresh concrete in the dense reinforcement zones. To overcome these difficulties, in the late 90's Okamura, Ochi and Ozawa have introduced the self-compacting concrete technique. With this, the concrete fills all the places of the formwork by its weight and there is no need for the compaction for becoming dense. The self-compacting concrete can be placed either by pouring or pumping, depending upon the structural elements like slab, beam, and column. Due to the addition or replacement of mineral admixtures such as flyash, condensed silica fume, and metakaolin the workability property of the concrete is influenced and also enhances the structural properties like compression, tensile and flexural strengths. The chemical

PROPERTIES OF HIGH STRENGTH CONCRETE WITH BASALT FIBER AND FLYASH – AN EXPERIMENTAL STUDY

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Abstract

The present paper presents the experimental study carried out to evaluate the characteristics of basalt fiber reinforced concrete and also the properties of concrete when basalt fibers are added to it along with flyash. All the experiments were conducted following the Indian standards. The test programme was conducted for fresh and hardened concrete properties. The fresh concrete properties consisted of the tests like slump, time of setting, bleeding, temperature and density. The hardened concrete properties determined are compressive strength, flexural strength and split tensile strength. The strength of concrete by replacing the cement with flyash in 20%, 30%, 40% proportions along with basalt fiber is found out. The concrete specimens are cast with basalt fibers in the proportions of 0.25%, 0.5% and 0.75% by volume of concrete. Specimens of high strength fly ash concrete with basalt fibers were cast, cured and tested for different strengths.

The tests show that basalt fiber can be easily mixed in the concrete without any balling, bridging or segregation. There was a noticeable increase in the flexural and split tensile strengths due to the addition of basalt fibers. When the concrete is partially replaced with flyash there was improvement in the workability and also strength at optimum percentage. High strength flyash concrete with basalt fibers is not only economical but also offers resistance to corrosion.

Keywords: Mineral Admixtures, Chemical admixtures, basalt fiber, segregation, corrosion

I.   INTRODUCTION

Plain concrete possesses a very low tensile strength, limited ductility and little resistance to cracking. Internal micro cracks are inherently present in the concrete and its poor tensile strength is due to the propagation of such micro cracks, eventually leading to brittle fracture of the concrete. It has been recognized that the addition of small, closely spaced and uniformly dispersed fibers in concrete would act as crack arresters and would substantially improve its static and dynamic properties. This type of concrete is known as Fiber Reinforced Concrete. Cement concrete has established itself as the most preferred material of construction in Industries, Infrastructure projects and housing, owing to is versatility, ease in production and placement and knowledge about its behavior. However three factors are gaining emphasis in this respect. The first one is the durability aspect of concrete, which affects the performance of the structure in its life period. The second one is the need to achieve economy by improved design and reduction in cost of materials and construction. The third one is economy conservation and environmental protection. These three factors can

Hydrological modeling with respect to impact of land-use and land-cover change on the runoff dynamics in Budhabalanga river basing using ArcGIS and SWAT model

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ARTICLE INFO

ABSTRACT

Catchment area is observed to be standard unit for management of the natural resources. The origin of catchment area parameters using Remote Sensing (RS) and Geographical Information System (GIS) and use Soil Conservation Services Curve Number (SCS–CN) methods is the running trend for hydrologic estimation of catchment areas. Urban runoff increases significantly due to increased impervious area and decreased the forest area. Estimation of land use in built-up area plays a vital role as input to the evaluation of runoff. The broadcast specification model Soil and Water Assessment Tool (SWAT) has been tested on monthly basis for evaluating surface runoff from a small gauging station of Govindpur in NH5 road located along the Budhabalanga river basin. By using the GIS technique there have been generated several maps like watershed boundaries, drainage line, land use/cover, soil map and slope map. Potential of the model for generating rainfall has been calculated for 6 Years interval (2000, 2006, 2012 and 2018) period. The results depict that SWAT model usually performs well in simulating runoff according to Nash-Sutcliffe Efficiency (NSE) and Coefficient of Determination (R^2) values. For monthly stream flow the NSE and R^2 values were 0.827 and 0.957 during the simulation period respectively. The results of the study indicated that the though land use patterns have changed resulting in increase in agricultural, built-up, water land and decrease in forest and barren land.

1. Introduction

Water is the very essential natural resources procurable on earth. The life cannot be conceived without it. The earth surface is covered 71% of water and in human body 61% of water is available. Everywhere water is essential for various purposes. 96.5% covered with water, 1.7% small part of water covered groundwater and 0.001% is occurred due to precipitation, vapours and clouds. Due to excessive weather condition in present days of climate the substantial economics are damaged. These days, Remote Sensing (RS) serves as an essential tool to gather data and information for hydrological modelling Engman et al. . Remote Sensing has the ability to predict or determine precipitation, snow cover, soil moisture, and Evapotranspiration and water quality spatially. In addition, satellite images can give details about properties of watershed (e.g. topography, stream network properties). Zhan and Huang (2004) evaluated runoff or infiltration by using SCS-CN and GIS techniques. They

stated that application of GIS models such as dissolving, intersecting and a curve number. Overland flow (also known as surface runoff) is a fraction of precipitation which takes place as extra tempest water, dissolve water, or other origins of flow over the earth's top. Kannan et al. (2008) studied how to reliable calibration and validation in preparing the results for the models. In this study the water resources management's problems had increased due to the use of distributed parameter models. Surface runoff is an important element of the water cycle and the prime agent causing soil erosion by water. Rainfall-Runoff model helps to compute – loss rate, peak runoff rate, runoff volume and base flow. Chandra et al. employed runoff-rainfall data for identifying the NSE parameters in the watersheds. Nash-Sutcliffe efficiency (NSE) method is for sediment yield. It is employed for – flood protection, forecasting of real time flood, water demand forecasting, water resources management and to assess the modification in stream flow. Climatologically parameters are also having great influence on the

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A Novel Proficient Secure Routing Strategy In Mobile Ad Hoc Frame Using Heuristic-Based Load Balancing Protocol

T.V.Suresh Kumar, Dr.Prabhu G Benakop

🔒 PDF

Abstract

Mobile Adhoc Network (MANET) is the flexible communication paradigm in digital communication appliance. However, it lacks in several key issues like data traffic, energy usage and security. So, clustering model is designed in MANET frame to reduce the energy usage. However, the clustering replica also suffered in serious issues like data overhead and security concern. So that, in this present article, a novel Optimized concentric cat Swarm based Routing (OCCSbR) load balancing based secure clustering scheme is developed to avoid the data overhead and security issues. Here, the fitness process of Cat is utilized to predict the malicious hubs and balanced the

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Direct-Driven Permanent Magnet Synchronous Generator Based Wind Energy Conversion System with A Neutral-Point Clamped Grid-Side Converter

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ABSTRACT:

This paper proposes theresearchwork on control and performance evaluation of grid connected Wind Energy Conversion System (WECS) with Permanent Magnet Synchronous Generator (PMSG).In this work, the Wind Turbine Emulator with Self Excited Induction Generator (SEIG) data is taken and compared with simulation results of PMSG based WECS reveals that the performance of PMSG based WECS is better than SEIG based WECS. The Five-Level Neutral-Point Clamped Multilevel Inverter (FLNPCMLI) is coupled with grid for variable speed WECS. The real time system is compared with simulation results which demonstrate that the proposed Five level inverter gives better performance than two level inverter with PMSG based WECS.

Key words: PMSG, Wind, NPCMLI,WECS

I. INTRODUCTION: Uneven heating by solar radiation, of the earth's surface causes temperature differences in the air masses, causing movement known as wind flow. This wind flow is further accentuated by the spin of the earth [1].Solar radiation heats up the land and water bodies. The rate of absorption of heat being different, the land mass gets heated up faster than the water bodies and the air above the land mass is heated by convection and radiation.

Hot air being less dense is lighter and it rises above, giving space for cold air to occupy, which again gets heated up in due course of time and the cycle follows. On similar lines, the equator gets heated up than the poles of the earth, causing atmospheric wind cycles [1].

POWER IN WIND

The power (PM) developed by an air mass of density (ρ) flowing at a velocity (v m/sec), through an area (m^2), is given by
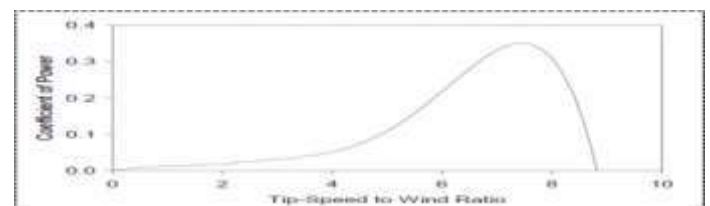
$$P_M = \frac{1}{2}\rho A v^3 C_p$$

Here C_p is coefficient of power of the blade.

Fig 1. gives the variation in coefficient of power vs tip speed to wind ratio.

Fig 1. Typical coefficient of power curve

The limits of power coefficient, known as Betz Limit indicates that the max power which can be transferred from wind flow does not exceed 59.3 % [18]. Due to practical reasons such as friction, rough surfaces of turbine rotors etc, the power coefficient, however lies in the range of 25 to 45 %.

A Secure Routing Protocol for MANET using Neighbor Node Discovery and Multi Detection Routing Protocol

T.V.Suresh Kumar[#1], Dr.Prabhu G Benakop[*2]

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Abstract:

Mobile Ad hoc Networks is enormously used owing to its mobility in addition to flexibility in a widespread range of applications. Since, the mobile ad hoc network is an autonomous system which is generated by mobile nodes without any infrastructure support. The cooperative and dynamic nature of the MANET affects the data transmission through the network. Therefore, the secure routing protocol is required to develop for protecting the routing and application data. In this paper, a neighbor node discovery is developed for identifying the black hole nodes in the MANET. Additionally, the multi detection routing protocol is used to generate the routing path through the network. The key objective of this research is to generate the routing path without any interruption of black hole nodes. The performance of the proposed technique is analyzed in terms of energy consumption, lifetime, packet delivery ratio, throughput and end to end delay. Additionally, the proposed method is estimated with the existing method namely EIMO–ESOLSR. The energy consumption of the proposed technique is 115J for 10 misbehaving nodes which is less than the EIMO-ESOLSR

Keywords: *Black hole node, mobile ad hoc network, multi detection routing protocol, neighbor node discovery and secure routing protocol.*

I. INTRODUCTION

MANET is generally a pool of self-sustaining movable nodes that communicated over the wireless connections [1]. The nodes in the MANET has the responsibility for transmitting the data as well as the unpredictable MANET structure is created, when the nodes are randomly join or leave the network while transmitting the data packets [2]. The nodes of the MANET is act as source as well as a router [3]. Since, the MANET is operated in the infrastructure-less environment that doesn't has any central infrastructure to manage the network functions. The mobile node in the MANET has restricted transmission range i.e., a few 100 meters. Hence, the intermediate nodes are used to perform the data transmission, when the desired node is not in the transmission range [4] [5]. This is obtained by using the two kinds of MANET networks such as single-hop and multi-hop [6]. Generally, the routing protocols in the MANET is classified into three types such as proactive, reactive, and hybrid protocols [7]. The MANET is used in various applications such as smart agriculture, disaster recovery, military applications, scientific research and wildlife monitoring [8].

The major characteristics of the MANET are limited battery power, limited bandwidth and dynamic topology. This characteristic creates the difficulty while generating the transmission path in the MANET [9] [10]. The inherent characteristic of the MANET such as dynamic topology and open wireless medium causes the network as susceptible to security threats. Therefore, it is to deliver the secure and trusted communication over the MANET [11]. The selfish or malicious node affects or even rejects the data transmission of any node which present in the networking domain [12]. Besides, the packet drop through the network is mainly depends on the malicious node or threats [13][22]. Since, the network without any centralized infrastructure is required to be use the trusted certification authority or key distribution center for delivering the cryptographic keys to improve the authentication during transmission [14][23]. The security mechanism used in the MANET required to provide the integrity, authentication, non-repudiation, confidentiality and availability over data transmission [15][24]. The major aids of this research are given as follows:

- The black holes in network are detected by using the neighbor node discovery during communication. This neighbor node discovery is required to be used only once to detect the black holes. This helps to minimize unwanted energy dissipation through the network.
- A multi detection routing protocol is used to identify the shortest path through the network. Since, the information about the black hole

Designing an Efficient Forecasting Routing Protocol to Secure the Mobile Ad Hoc Network Communication

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Abstract-   *The mobile ad hoc network (MANET) is organized with the group of mobile nodes that are communicated in a wireless medium. However, several malicious activities are present in the MANET that can interrupt the data transmission. In MANET, Black-hole (BH) attacks are the crucial malicious activity that can able to drop the packets while transmitting the messages. To prevent the BH attacks in MANET, the current research develops the Optimized Fisheye Swarm Routing Protocol (OFSRP) model. Here, the developed OFSRP approach detects the BH attacks in the network and transmits the message in a secure path. Moreover, the developed model creates a network based on the structure of 'Fisheye' that is utilized for securing the communication. The implementation of this developed protocol is done with the use of Network Simulator 2 (NS-2) tool. Moreover, the performance metrics are evaluated with existing methods in terms of Packet Delivery Ratio (PDR), prevention accuracy, throughput, and end-to-end delay.*

Keywords – *mobile ad hoc network, malicious activities, Black hole attack, routing protocol,*

I.   INTRODUCTION

In recent years, MANET is an efficient and exciting technology due to the rapid proliferation of communication devices in the wireless medium [1]. Ad hoc networks are utilized for many applications because it is more reliable for preserving the capability of the traffic load, robustness, and flexibility [2]. In general, MANET is a collection of devices that are employed to transfer the message in a wireless network [3]. Also, these MANET is not having a particular infrastructure like mobile switching centers and base stations [4]. So, nodes in the network are freely moved anywhere in the channel while communicating between the nodes [5]. In MANET, the mobile nodes are employed for sending the message from the initial hub to the target and the in-between nodes are doing the function of router [6]. MANET nodes are utilized the dynamic

Cmos Rf Transceiver For Wireless Sensor Networks In Medical Field

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Abstract:

Wireless sensor network cost reduction has become a critical necessity for expanding their use in fields where a large number of sensors are needed. For analog sensors, the traditional method of using multichannel analog-to-digital converters and/or analog multiplexers would not result in a price reduction. Furthermore, the analog multiplexer adds to the measurement error. The developed advanced, stable, yet cost-effective sensor nodes architectures are described in detail in this paper and are suitable for further integration in a node on chip. These sensor nodes can operate with a wide range of analog and quasi-digital sensors and transducers, and their sensing subsystem allows for the best metrological results. A comprehensive comparative study of sensor node's architectures and sensing sub-systems are presented.

Keywords: Wireless Sensor Network, Low power RF, CMOS, Healthcare monitoring; medical information systems.

1. INTRODUCTION :

"Wireless sensor networks (WSN) field is a very active research topic with many applications in area monitoring, industrial monitoring, biomedical systems and agriculture. It is a group of small sensing nodes (sensors) that collect physical information from the surroundings and communicate wirelessly to send the collected data to a base station. WSN nodes can be powered internally using a battery attached to the node or wirelessly by harvesting the power of the transmitted RF signal as in passive WSN"[1]. Either way, the transceiver circuit of each node should be designed to meet the minimal power requirements.

The nodes that make up the network play a key role in wireless communication since wireless sensor networking is designed around low-power radios. The deployment of nodes can take many different physical forms, depending on the sensor application and the desired communication pattern. Deployment may also be a one-time event, with the installation and use of a sensor network taking place at different times. It can also be a continuous mechanism in which more nodes are added to the network over time. A single sensor node to multiple sensor nodes can be used in the application.

Background

"There is a long history of using sensors in medicine and public health" [2], [3]. Sensors, which are embedded in a variety of medical instruments for use in hospitals, clinics, and homes, provide insight into physiological and physical health states that are critical to the detection, diagnosis, treatment, and management of ailments. Many aspects of modern medicine would be impossible or prohibitively expensive without sensors such as thermometers and blood pressure monitors. Pressure monitors, glucose monitors, electrocardiography (ECG), photoplethysmography (PPG), electroencephalography (EEG), and various imaging sensors are all examples of medical devices. Interventional devices such as pacemakers and insulin pumps require the ability to calculate physiological condition.

Recent years have witnessed the emergence of various embedded computing platforms that integrate processing, storage, wireless networking, and sensors. These embedded computing platforms offer the ability to sense

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CMOS Applications and Implementation Procedure of Wireless Multimedia Sensor Network

Chandrasekhar Kandagatla, Dr. Prabhu G. Benakop

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ABSTRACT

CMOS technology has a major advantage over NMOS and BIPOLAR in this regard. Unlike NMOS and BIPOLAR circuits, complementary MOS circuits dissipate almost little static power." If a circuit does in fact switch, power is simply dissipated. Greater utilisation of CMOS technology leads in better performance as compared to that of NMOS or bipolar technology. To construct CMOS transistors, the P- and N-channel MOS diodes are used (NMOS). CMOS transistor manufacture is explained in detail here. This paper privdes the information about the applications of CMOS and also the implementation procedure of wireless multimedia sensor network.

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ABSTRACT

There is a strong demand to govern the communication of portable and implantable personal health care devices in a single wireless network as the number of these devices grows. Wireless communication technology advancements have made these gadgets more user-friendly. The power consumption of these gadgets is one of the hurdles in their implementation. WBAN (wireless body area network) has recently gained a lot of attention. WBAN is made up of a variety of healthcare equipment or physiological sensors that communicate wirelessly to provide continuous and ambulatory health care. WBAN technologies have been a

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TITLE OF INVENTION	SOLAR POWERED HYBRID ENERGY BANK
FIELD OF INVENTION	ELECTRICAL
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REQUEST FOR EXAMINATION DATE	19/03/2020
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FIRST EXAMINATION REPORT DATE	13/08/2020

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TITLE OF INVENTION	REMOTE CONTROLLED AIR VEHICLE BASED SANITIZING SYSTEM WITH PAYLOAD CARRIER
FIELD OF INVENTION	MECHANICAL ENGINEERING
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TITLE OF INVENTION	MICROCONTROLLER BASED INFINITESIMAL NEUTRALIZED INFECTIOUS CIDE (M.I.N.I. CIDE)
FIELD OF INVENTION	BIO-MEDICAL ENGINEERING
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TITLE OF INVENTION	VIDYUTA DVICAKRAVAHANA – An electric bicycle
FIELD OF INVENTION	ELECTRICAL
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TITLE OF INVENTION	VIDYUTHA TRAYA CHAKRA VAHANA – A HYBRID ELECTRICAL TRICYCLE
FIELD OF INVENTION	ELECTRICAL
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TITLE OF INVENTION	ABHIGNA VIDYUT SAMPUTAH – A SMART ELECTRIC EXTENSION BOX
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Studies on 4 - dimethylaminopyridinium salicylate monohydrate's optical, mechanical, and laser damage threshold

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A B S T R A C T

Slow evaporation solution growth was used to grow single crystals of 4-dimethylaminopyridinium salicylate monohydrate. Single crystals of good optical quality with dimensions up to $14 \times 6 \times 5$ mm^3 are obtained. Single crystal X-ray diffraction analysis verified the unit cell parameters of the grown crystals. In the wavelength range of 200–1100 nm, the UV–Vis–NIR Transmittance spectrum was observed. Vicker's microhardness test was used to examine the mechanical behaviour of the grown crystal. Using 5 ns laser pulses at a 10 Hz repetition rate from a Q-switched Nd: YAG laser with a wavelength of 1064 nm, the laser damage threshold value was calculated.

1. Introduction

For many applications in telecommunication, optical data storage, optical information processing, optical switching, frequency transfer, and electro-optical modulation, the science and technology of crystal growth has progressed rapidly [1,2]. The synthesis and growth of organic nonlinear optical crystals, as well as their structure-property relationship, have recently seen an exponential increase in research into new organic nonlinear optical materials for their possible use in a variety of devices. The first and most important benefit of using organic materials is that the molecular structure can be fine-tuned with desired nonlinear optical properties and a wide structural diversity using chemical synthesis [3,4]. Photonic applications, such as all-optical switching and data processing, necessitate molecules with significant optical nonlinearities. Nonlinear optical processes are dominated by material nonlinear susceptibilities. Non-linear susceptibilities are graded as second order, third order, and so on, depending on the number of applied electric fields. When using a traditional laser, the non-linear polarization and the size of the non-linear effect decreases as the order of susceptibility increases [5–7]. As a result, in practical applications, nonlinearity up to the third order is used. Optical, mechanical, and laser damage threshold studies on 4-dimethylaminopyridinium salicylate monohydrate were addressed in this study.

2. Material synthesis and crystal growth

In an equimolar ratio, analytical grade 4-dimethylaminopyridine and salicylic acid were used. The synthesis and reaction scheme have already been explored [8]. DMAPSA solubility was determined as a function of temperature in the range of 30–50° Celsius. DMAPSA solubility was determined using a gravimetric method in a methanol-water (1:1) solvent at temperatures ranging from 30 to 50 °C. Fig. 1 shows the DMAPSA solubility curve.

DMAPSA has a positive solubility gradient in the methanol-water (1:1) solvent, according to the solubility curve. The purity of the solute and solvent determines the consistency of single crystals. As a result, the synthesized material was recrystallized number of times to produce a highly purified product. According to the solubility results, the saturated solution was prepared by continuous stirring for 4 h at a temperature of 36 °C. The prepared solution was then filtered using Whattmann filter paper before being covered with a good quality perforated polythene cover to prevent the solvent from evaporating too quickly. Finally, to keep the temperature of the prepared solution stable, it was held for evaporation in a constant temperature bath with an accuracy of ±0.01 °C. DMAPSA crystals of large size ($14 \times 6 \times 5$mm^3) were obtained after 20-days. Fig. 2 shows a photograph of a DMAPSA single crystal.

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Synthesis, growth, structural, spectral and optical studies on 2-amino-4-picolinium 4-hydroxybenzoate single crystals

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ABSTRACT

2-amino-4-picolinium-4-hydroxybenzoate (2A4P4HB) were grown as crystals using a controlled evaporation method in the present study. The lattice parameters of 2A4P4HB were affirmed using X-ray diffraction measurements. Using ^{1}H and ^{13}C nuclear magnetic resonance spectral studies, the proton and carbon position was determined. Linear optical study was used to determine the cut off wavelength and the wide optical operating window. Thermogravimetric and Differential Thermal Analysis were used to examine their thermal response. Vickers microhardness testing was used to determine mechanical stability at room temperature. Meyer's law was used to investigate the hardness results. The Z scan measurements were performed on 2A4P4HB.

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1. Introduction

Supramolecular design has drawn a lot of interest in optoelectronic applications in the recent past. They are focused on interactions between hydrogen atoms. Many new organic single crystals have been identified using a molecular engineering approach, which is said to have scientific and technological applications [1]. Higher harmonic frequencies, terahertz wave generation, optoelectronic modulation, frequency mixing, self-focusing, optical limiting, optical rectification, optical switching, and parametric oscillation are only a few of the applications. [2–4], research is now centered on the design and development of single crystals. A supramolecular architecture is formed by a large number of organic molecules with hydrogen bond donor acceptor groups [5]. Organic molecules with electron donating and electron withdrawing groups have a high polarizability. A major focus of research is the evolution of highly well-ordered materials for their usage in optical communication. Organic single crystals have supe-rior nonlinear optical properties in the second and third orders, as well as low dielectric values, high optical damage resistance, higher values, and multifunctional substitutions. Ground state charge asymmetry is given by the donor and acceptor groups, which is important for nonlinearity in terms of first and second order. [6–10]. The existence of different organic subnetworks in organic materials causes non centrosymmetry, which enhances mechanical and thermal stability through bonding. [11–13]. Hydrogen bonding structures between carboxylic acid derivatives and pyridine have been documented as a potential coordinating force in supramolecular architecture. [14,15]. Heterocyclic amines, such as aminopyridines, are important materials in the biological field. Antibiotics, antitumor, anti-inflammatory, and psychotropic effects are among the biological properties they exhibit. Ordinary moieties in several molecules shape aminopyridines, which have catalytic, electrochemical, and photophysical properties due to their amino group [16,17]. Complexes based on pyridinium and benzoate derivatives have been synthesized in recent years, including 2-aminopyridinium benzoate [18–20]. One such organic compound is 2-amino-4-methyl pyridinium 4-hydroxybenzoate, whose structure is studied already [21]. According to a thorough investigation, no other characterization findings for this material

Organic piperazine p-nitrophenol (PPN) single crystal growth and characterization

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ABSTRACT

The monitored conventional solution growth technique was used to develop organic piperazine p-nitrophenol (PPN) single crystals. The crystal system and lattice parameters of PPN were confirmed using powder single crystal X-ray analysis. FTIR spectroscopy used to investigate functional groups of PPN. A UV–vis-NIR analysis was performed to examine the cut-off wavelength and the optical operating window. The bandgap of the material was measured. Thermogravimetric and Differential Thermal Analysis measurements was used to determine the thermal characteristics of PPN crystal. At room temperature, the Vickers microhardness test was used to determine mechanical stability. The results of hardness were examined using Meyer's law. The Kurtz and Perry powder method is used to measures the Second Harmonic Generation of PPN crystals.

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1. Introduction

The utility of many crystals in important fields of service to mankind, such as research, medicine, engineering, and technology, as well as strategic areas of defence and space science, is due to crystal growth in this age of tremendous technological excellence. A single crystal is a product in which the entire sample's crystal lattice is continuous and unbroken to the sample's edges with no grain boundaries. Mono crystals have distinct mechanical, optical, and electrical properties, which can be anisotropic depending on the crystallographic structure. It's used in technology, especially optics and electronics. Single crystal of conjugated organic molecules is, undoubtedly, the materials with the highest degree of order and purity among the variety of different forms of organic semiconductors [1,2]. Laser resonators, acoustic optic modulators, phase decay plates, polarizers, pyroelectric detectors, piezoelectric devices, crystal x-ray monochromators, scintillation detectors, holographic devices, iron selective electrode membranes, and thin film substrates all benefit from the crystalline property [3,4].

Organic materials with a characteristic odour response, custom versatility, low mobility, and a large band gap could be used in a variety of ways. In organic materials, donor and acceptor groups can indeed be found at either end of a conjugated path. Organic molecules are especially attractive because they can provide a crystal lattice with a closely aligned and stable chromosphere orientation. Organic molecules substituted with DA portray NLO and electro-optical effects. Doubling or tripling the amount of light frequency is helpful in various modern technologies like optical computing and telecommunication [5,6]. Organic materials are made up of chemically bound molecular units that interact in bulk media through weak vander waals interactions. Organic molecules that contain all conjugated bonds and agree to group on the other side are known as (NLO) materials. Over the last two decades, extensive theoretical and experimental research has been conducted on the NLO properties of large organic molecules. Piperazine is an organic compound that is made up of a six-membered ring of two nitrogen atoms in opposite positions.

P-nitrophenol is a yellow material with a pH of 5.4 and a colour of yellow with a pH of 7.5. The synthesis, structure, and growth of PPN crystals using ethanol as a solvent have previously been published [7,8]. Using methanol as a solvent, we try to develop bulk crystals with well-defined facets and good transparency. This

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Nucleation, dielectric, and ferro electric studies of potassium succinate succinic acid (KSSA) crystals

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ABSTRACT

The semi-organic material has strong optical non-linearity as well as thermal stability, both of organic and inorganic semiconductors. CNT and DFT are used to evaluate the nucleation kinetics of KSSA. With respect to varying temperatures, the kinetic parameters enthalpy, Gibbs free energy, real heat power, and entropy of activation are measured. the optimized geometric configuration of the compound is computed from DFT-B3LYP gradient calculations using the 6-31G (d,p) basis set, and its vibrational frequencies are noted. Vibrational parameters are assessed, and correlative equations pertaining to the variations in these thermodynamic properties are computed. The width of KSSA's Meta stable zone as a function of supersaturation is also calculated. Horowitz–Metzger, Coats–Redfern, and Piloyan–Novikova use thermo gravimetric methods to evaluate kinetic parameters. P-E hysteresis loop analysis identifies the crystal's Ferro electric origin. The loss tangent and dielectric constant range is registered between 35 K and 155 K, making it suitable for optoelectronic and non-volatile application.

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1. Introduction

Organic materials have poor clarity, a short optical band gap, a low laser damage threshold, and difficult to grow as large size optical quality crystals for device applications. New groups of optical crystals, such as semi-organic crystals, have been developed to overcome the limitations of organic materials, which have poor clarity, a short optical band gap, a low laser damage threshold, and difficult to grow as large size optical quality crystals for device applications. [1,2], as well as being difficult to grow as large size optical quality crystals for device applications [3]. Some semi-organic materials combine organics' high optical non-linearities with inorganics' strong thermal stability and transmittance. The solution growth technique [4] can be used to easily grow semi-organic crystals. A crystalline product's quality is determined by its crystal size distribution, purity, morphology, and solid-state form. The nucleation activity during the crystallization process has a big impact on it. The metastable zone distance, induction time, or number of nuclei produced can all be used to determine the primary nucleation kinetics [5–6]. For bulk growth crystals, CNT explains the fundamental concepts of nucleation processes using macroscopic quantities. DFT, on the other hand, defines microscopic values at which an inhomogeneous system's free energy is a function of the system's density profile. DFT is structure based, whereas CNT is experimentally dependent. The density profile facilitates the fast measurement of various crystal thermodynamic properties [7]. The nucleation parameters of the KSSA crystal, such as interfacial energy (σ), volume of free energy (ΔG_v), critical energy barrier for nucleation (ΔG^*), radius of the critical nucleus (r^*), and nucleation rate (J). The super saturation ratio has been calculated at various temperatures with regular fluctuations in the super saturation ratio, and vice versa. In support of the analysis, the thermodynamical parameters for various temperatures are graphically represented. CNT and DFT metastable zone widths are calculated. TG graph is used to quantify fractional weight loss (α) at various temperatures during various stages of

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(21) Application No.202141004475 A

(43) Publication Date : 12/02/2021

(54) Title of the invention : INVESTIGATION OF ELECTRICAL PROPERTIES OF PURE AND THALLIUM CHLORIDE DOPED POLY VINYL ALCOHOL POLYMER ELECTROLYTE FILMS

(51) International classification	:H01M0010056500, B01D0067000000, H01G0009025000, C08F0216060000, A61B0005000000	(71)Name of Applicant :
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Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :
Abstract Poly Vinyl Alcohol is a water-soluble amorphous/crystalline polymer that is widely used in protective coating, biomedical and optical materials, orbents and membranes. In the present investigation, an attempt has been made to characterize the polymer electrolytes based on Poly vinyl alcohol substituted with thallium chloride at different weight percentage ratio. Solid polymer electrolyte films based on poly vinyl alcohol doped with Thallium Chloride (TlCl) were prepared using solution cast technique. In the present communication, we studied the Conductivity variation with the concentration of Thallium Chloride (TlCl) in Poly Vinyl Alcohol and Conductivity variation with the temperature in Thallium Chloride (TlCl) substituted Poly Vinyl Alcohol.

No. of Pages : 10 No. of Claims : 5

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(54) Title of the invention : A COMMON FIXED POINT THEOREM FOR COMPATIBLE MAPPINGS OF TYPE (C)

(51) International classification : H04W0072040000, H04N0019900000, G01N0033240000, H04L0001060000, G01N0030060000
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     Filing Date :NA
 (62) Divisional to Application Number :NA
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(57) Abstract :

Abstract The study of common fixed point of mappings satisfying contractive type conditions has been a very active field of research activity during the last two decades. The three types of contractive conditions (Banach, Meir keeler and contractive gauge function/f contractive condition) hold simultaneously or independent of each other and as a result of this study they have proved a fixed point theorem using Lipschitz type contractive condition and gauge function.

No. of Pages : 19 No. of Claims : 3

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :30/07/2021

(21) Application No.202141034416 A

(43) Publication Date : 06/08/2021

(54) Title of the invention : SYNTHESIS, CRYSTAL STRUCTURE, SPECTRAL AND THERMAL PROPERTIES OF 4-DIMETHYLAMINOPYRIDINIUM SALICYLATE MONOHYDRATE

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(57) Abstract :

Abstract 4-dimethylaminopyridinium salicylate monohydrate (DMAPSA) was synthesized and its crystal structure was determined using single crystal X-ray diffraction analysis. From the crystal structure analysis it can be inferred that the crystal belongs to monoclinic system with space group of P21/n. Investigation has been carried out to assign the vibrational frequencies of the grown crystals by FTIR spectral studies. 1H and 13C FT-NMR has been recorded to elucidate the molecular structure. Molecular mass of DMAPSA has been measured using mass spectroscopic analysis. The thermal stability and thermal decomposition of DMAPSA have been investigated by means of thermo gravimetric analysis and differential thermal analysis. The melting point of crystal was observed as 172° C by melting point apparatus. Fluorescence spectra were taken for the excitation wavelength of 240 nm.

No. of Pages : 15 No. of Claims : 3

(54) Title of the invention : GROWTH, STRUCTURAL, THERMAL, OPTICAL, AND ELECTRICAL PROPERTIES OF POTASSIUM SUCCINATESUCCINIC ACID CRYSTAL

(51) International classification	:C30B0007000000, C30B0029020000, C30B0029040000, C30B0029160000, C30B0029600000
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(61) Patent of Addition to Application Number	:NA
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(57) Abstract :
Abstract Potassium succinatesuccinic acid (KSSA), semi-organic single crystals were grown by slow evaporation growth technique using water solvent. Single crystal X-ray diffraction study revealed that the KSSA crystal belongs to monoclinic system. FT-IR and FT-Raman spectral studies were performed to identify the vibrations of functional groups. TGA/DTA analyses were carried out to characterize the melting behavior and stability of the title compound. The UVVisNIR spectrum showed that the grown crystal is transparent in the entire visible region. Fluorescence studies were carried out in the range of 200700 nm. The optical nonlinearity of KSSA was investigated at 532 nm using 7 ns laser pulses, employing the open aperture Z-scan technique. The photoconductivity study was carried out to know the conducting nature of the crystal. The laser damage threshold was measured using Q-switched Nd: YAG laser (1064 nm). Electrical properties of the crystal are studied using Hall Effect measurement.

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(19) INDIA

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(54) Title of the invention : CREATING A SELF-ASSESSMENT TOOL FOR AN ENGLISH-LANGUAGE-TEACHER AND ITS IMPLEMENTATION

(51) International classification	:G09B0019060000, G06Q0010060000, G06Q0050200000, G09B0007020000, G06N0005040000	(71)Name of Applicant : 1)Md. Thofeeq, Assistant Professor/ Department of H&S, Sri Indu College of Engineering & Technology (Autonomous). Address of Applicant :Sri Indu College of Engineering & Technology (Autonomous), Ibrahimpatnam, R.R. District, Telangana-501510. Telangana India 2)Dr. S. Rangaraju, Associate professor /Department of H&S, CMR Engineering College. 3)Dr.B.Deepa, Assistant Professor/Department of H&S, CMR Institute of Technology. 4)A.Divya, Assistant Professor /Department of H&S, CMR Engineering College. 5)S.Nagapadma, Associate professor /Department of H&S, CMR Engineering College. 6)Priyanka Vennam, Assistant professor/ Department of H&S, AVNIET. 7)I.V.Sona Lakshmi, Assistant Professor / Department of H&S, Methodist College of Engineering & Technology. 8)J.R.Hepzabah, Assistant Professor / Department of H&S, Methodist College of Engineering & Technology.
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(57) Abstract :
Abstract Many information sources are cited in this literature as best practices for teacher assessment. One head examined in-depth in this article is teacher self-assessment. Using the specific self-assessment tool, we develop and results from its use with around 1700 teachers of English. We characterize how that tool was developed, analyze the data of its usage, and critically evaluate what these data mean for this precise tool and the need for self-assessment in Language learning and training, wherever teacher evaluation research is limited. About 93% of test-takers approved or strongly approved that the SAT covers most of the abilities, knowledge, and behaviors that instructors require. Another question was posed, Have you finished the SAT within the allotted time of 30 minutes More than 91% of respondents claimed to have.

No. of Pages : 13 No. of Claims : 5

Estimation of Number of Levels of Scaling the Principal Components in Denoising EEG Signals

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Electroencephalogram (EEG) is basically a standard method for investigating the brain's electrical action in diverse psychological and pathological states. Investigation of Electroencephalogram (EEG) signal is a tough task due to the occurrence of different artifacts such as Ocular Artifacts (OA) and Electromyogram. By and large EEG signals falls in the range of DC to 60 Hz and amplitude of 1-5 μv. Ocular artifacts do have the similar statistical properties of EEG signals, often interfere with EEG signal, thereby making the analysis of EEG signals more complex[1]. In this research paper, Principal Component Analysis is employed in denoising the EEG signals. This paper explains up to what level the scaling of principal components have to be done. This paper explains the number of levels of scaling the principal components to get the high quality EEG signal. The work has been carried out on different data sets and later estimated the SNR.

Keywords: Principal components, PCA, Multi scale PCA (MSPCA), Denoising, and SNR.

The study of Electroencephalogram is very much helpful in diagnosing different disorders of the nervous system. EEG is the electrical action recorded from the scalp surface, which is picked up by conductive media and electrodes[1-3]. EEG has been performing a vital role in investigating brain activities in clinical application and scientific research for several years[4-6]. The EEG signals can be contaminated by various artifacts, of which the major noise source is ocular artifact, which includes Eye-movement and eye-blink's[7]. However, artifacts are the major enemies of high-class EEG signals. The mixing up of these ocular artifacts with the EEG signal at the time of recording causes the problems in the accurate estimation of EEG signal. These artifacts will plunge into either of the 2 categories namely, technical and physiological artifacts. Power line noise 50/60Hz falls into technical artifact category while the artifacts that crop up because of ocular(EOG), heart(ECG) and muscular activity(EMG) falls into physiological artifacts category respectively[8].

Regression in the time domain and frequency domain[9-11] methods were proposed in removing eye blinks artifacts. These methods require a reliable reference channel. This channel can be contaminated by EEG. So, EEG has to be removed from the reference channel by regression techniques. Hence, the regression methods are not the finest to remove EOG artifacts.

Principal Component Analysis is one of the available techniques for extracting the information

Research Article

Risk Factor Analysis of Covid-19

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ABSTRACT

Background: Coronavirus is an unpredicted anti-human biological calamity. This virus questions the entire globe on its state and characteristics, which lead physicians, virology practitioners to give conditional statements and fearful myths.

Objective: This analysis aims to provide a probability to get infected with Covid-19 for patients with various health complications.

Methods: Data set from Mexican government contains 566,602 Covid-19 test samples. Data analytics adhere to 16 parameters of habitual and health constraints on this data set are evaluated using R software.

Results: 7 out of 16 parameters exhibited Extreme Severity in getting infected with Covid-19, while other 6 and 3 are categorised into moderate and less severity respectively.

Conclusion: Risk factor analysis alerts the persons with these 16 parameters to take necessary precautions and preparedness for Covid-19.

Key Words: Coronavirus, COVID-19, Risk factor analysis

INTRODUCTION

As of now, there are seven types of coronavirus in humans that exhibit similar symptoms that cause disease. Four in this list are more often with symptoms of a cold. OC43 and 229E type coronavirus grounds common cold. HUK1 and NL63 are serotype coronaviruses that are also related to the common cold. These four viruses rarely effect on respiratory system in infants, aged, and less immune. But, another three of seven types of infections are more extreme and cause a noticeable impact on the respiratory system in humans.[1,2] Middle East Respiratory Syndrome (MERS) is one of a severe type of coronavirus which first emerged in Saudi Arabia. Later prominently it is transmitted to the Middle East, Asia, Africa, and Europe.[7] Severe Acute Respiratory Syndrome (SARS) is another type of coronavirus came into sight in china in 2002. Fortunately, there is no further notice of SARS cases identified. These types of coronaviruses are zoonotic that cause severe infections in the respiratory system, which originates from infected animals to humans.[8]

Now, in late 2019, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is another type of coronavirus outbreak in China and soon transmitted all over the world. International Committee on Taxonomy of Viruses (ICTV) nomenclate novel coronavirus as COVID-19. This infection affects the respiratory system. Upper respiratory tract like nose, throat, and sinuses or lower respiratory like windpipe and lungs are severely damaged and leads to shortness of breath. Similar to other coronaviruses, it is prone to get transmitted from person to person. Infected patients have to undergo treatment identical to the procedure for Cold.[9]

The key symptoms of Covid-19 patients include Fever, Cough, Sore throat, Breathing problem (Shortness of breath or trouble breathing), Shivering, Body pains, Headache, Fatigue, Loss of smell or taste, vomiting, Diarrhea. Covid-19, in its extreme, leads to pneumonia, respiratory system failure, and death due to the release of cytokine which affects the immune system by making bloodstream with inflammatory proteins results in killing tissues.[2]

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Effect of Sampling Frequency on SNR in the Removal of Ocular Artifacts in EEG Signals using Wavelets

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Abstract

This study investigates the relationship between sampling frequency and SNR of Electroencephalogram (EEG) signal. The EEG is a standard technique for investigating the electrical activity of brains in different psychological and pathological states. At the time of EEG recording, various artifacts such as muscle activity, eye blinks, eye movements and electrical noise corrupt the EEG signal. Normally, EEG signals fall in the frequency range of DC to 60 Hz and amplitude of 1-5 µv. Ocular artifacts have the similar statistical properties of EEG signals, and often interfere with EEG signal, making the analysis of EEG signals more complex. In this research paper, two different datasets were taken from Physionet data base. The sampling frequency of one dataset is 100Hz and the sampling frequency of another dataset is 250Hz. The research paper attempts to establish the relationship between sampling frequency and SNR of EEG signal. In this paper, the collected EEG signals are normalized and then mixed linearly with the normalized Electrooculography (EOG) signals, resulting in noisy EEG signals. Later soft and hard thresholding techniques were applied for detail coefficients and to estimate the SNR of the denoised EEG signals. This research paper concludes that signals with lower sampling rates provide better SNR than the signals with higher sampling rates. In addition to this, Haar wavelet provided better SNR compared to dB10 and Sym8 wavelets.

Keywords

Sampling Frequency, SNR, Wavelets, EEG, EOG.

EFFECT OF BRIGHT LIGHT ON EEG OCULAR ARTIFACTS

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Abstract

The Electroencephalogram (EEG) reflects electrical functionality of the brain as an advanced medical spectroscopy tool. EEG derives potential from the scalp electrodes, which occurs because of the neuronal firing. It records the strength of neuron firing in relation to time. Generally, the potential of EEG readings are observed to be in the order of microvolt seems as low amplitude and are highly prone to contamination of artifacts from other induced bioelectrical sources exhibited by nearer human organs such as the eye, etc. On precise statistical data analytics study on artifacts contaminating in EEG, it has been found that artifacts contaminating from Ocular organ into EEG has noticeable impact. It is also observed that light plays a vital role in defining amount of ocular artifact contaminating into EEG. This article synchronizes variables of light, ocular organ with EEG and through the statistical 'Z' test. Based on the calculated 'P' value comparing with 95% of level of Significance (α), confirms the alternate hypothesis that illumination in the EEG recording room also affect ocular artifacts. This is presented along with mathematical model and experimental analysis.

Keywords: *Electroencephalogram (EEG), Ocular Artifacts, Light*

I.   Introduction

Electroencephalogram is the physician recommended method for evaluating and recording brain electrical behavior. The human brain comprises of millions of neurons, and the electrical potential of this neuron is induced over the scalp at respective regions. Light is a transverse and electromagnetic wave, which human beings experience through sight. There are different physiological modifications in individuals when they are subjected to bright light [1,2,4]. However, light exposure causes natural physiological changes such as melatonin hormone suppression and the variation in core body temperature. The visible light into the human eyes causes the state of electroencephalographic measurements to change [3-11,14].

Ocular artifacts happen as a result of the superimposition of the ocular potential on the actual electric activity in the brain. The sort of motion performed by the eye of the subject and even the blink of the optic can illustrate this. In practice with ocular artifact, electrodes around the Ocular organ, such as the Front Polar (Fp) and Frontal (F) are mainly impacted. The eye functions as a dipole in which the retina is charged more negatively than the cornea. The possible distinction from the cornea to the retina is approximately 100 mV [11,16]. The ocular artifact in contaminated EEG signal is extracted using EEGLAB toolbox for MATLAB is shown in Fig. 1.
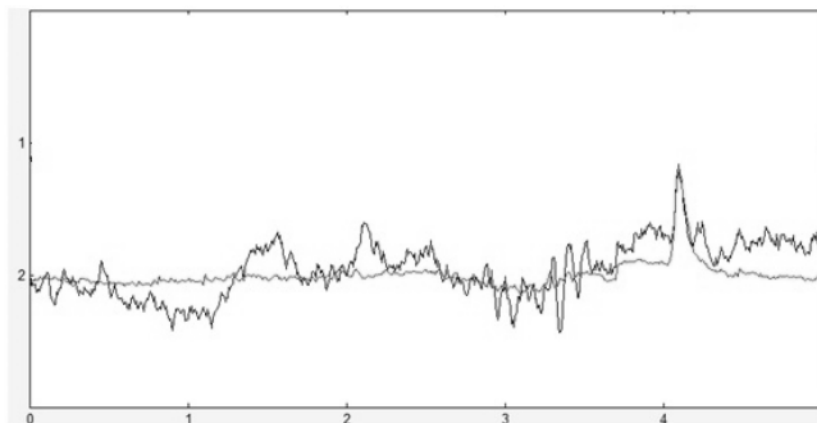

Fig.1. Occurrence of Peak in EEG signal due to contamination of EOG

Framework Design and Simulation of VANET Vehicle Positioning using Two Stage Sigma Point Kalman Filter (TSSPKF)

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Abstract: Improved GPS/INS/RFID integration method based on loosely coupled integrated federated approach (LCIFA) of variants of sigma point Kalman filter is proposed for vehicle localization application. It is applied to improve vehicle localization accuracy ubiquitously. This integrated localization method is useful in both indoor and outdoor environments comprises of different scenarios: Open area, dense area and tunnel area where GPS works in Open environment (GPS signal is available);GPS/INS works in dense/Semi-dense environment (GPS availability is short) and GPS/RFID works in Tunnel like area (No GPS available). GPS or GPS/INS system is used in outdoor environment and only Active RFID tags are hired (instead of complete RFID system) in case of indoor environment like Tunnel. A novel RFID tag placement strategy is introduced as placing active RFID tags at divider which gives very accurate localization with low cost investment and also passive RFID tags on the road side units i.e. sign posts. In this paper, the modeling of the LCIFA using sigma point Kalman filter based on position model only and TDNN is designed and simulated which provides better results as compared to real time evaluation. This is one of the novel sturdy approaches to vehicle communication.

Keywords: Vehicle localization, two stage sigma point Kalman filter, GPS/IMU/RFID, Time Delay Neural Network

1. Introduction

Vehicle localization is a key issue that has recently attracted attention in a wide range of applications. In modern intelligent transportation system era, unified vehicle positioning is a fundamental task. Nowadays, for outdoor vehicles positioning, there are many well-known low cost positioning systems as one of them is based on the GPS [1, 2] solution. Unfortunately, the GPS devices can be highly affected by errors due to satellite signals blocking, reflections (forests, tunnels and urban environments) or interferences. Also, inertial navigation systems (INS) are one of the earliest forms of navigation techniques. INS, functions on the principle of dead-reckoning[3], has a potential problem of ''integration drift" which is the accrual of small errors with time, which are composed into still greater errors in position. For indoor vehicles positioning like tunnels GPS outage occurs and use of INS is less beneficial because of addition of small errors with time. In such cases RFID[4] plays an important role for accurate vehicle positioning.

In vehicle localization individual system cannot works ubiquitously. So to provide continuous accurate vehicle position, system integration approach plays an important role. One of the earliest approaches in integration is to use Kalman filter. There are usually two ways that multiple sensors data can be fused based on Kalman filter [5]: one is centralized Kalman filter, the other is distributed Kalman filter. The centralized Kalman filter, in theory, can obtain the optimal system state estimate, but the drawbacks are the high dimensions of system states and the heavy computational load, affecting the dynamic and real-time performance of the filter. When a sensor's measurement has a larger deviation, the deviation will be propagated to the estimation of all the state variables, leading to the filtering accuracy and stability decrease.

The distributed Kalman filter is a two-stage data processing technology which substitutes the original centralized filter with a global filter and several local filters. In the first stage, local filter fuses each sensor information directly in parallel to produce the optimal local state estimation, In the second stage, the global filter fuses the state estimation of the local filters, producing the best overall estimates. Federated Kalman filter is a special distributed Kalman filter, its special feature is that it includes a process of information allocation.

Parametric Study of Ring Coupled and Strip Connected Ring Coupled With Different Orientations for Wireless Multiband Applications

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Abstract:

A ring coupled rectangular microstrip patch antenna (RC-RMPA) and Strip connected ring coupled rectangular microstrip patch antenna (SCRC-RMPA) with different orientations for dual, triple and multiand applications in the frequency range of 2-12 GHz are developed. Based on the surface current distribution antennas are analyzed for the possible dominant and higher order resonance modes. Further SCRC-RMPA with four orientations of 0° (along the length axis of the patch antenna), 90°, 180° and 270° is analyzed. These orientations increase the length of the surface current leading to decrease in dominant mode resonance and possible redistributation of higher order modes leading to multiple resonances. The proposed antennas are simulated using 3DEM of Mentergraphics and validated using Vector network analyzer**.**

Keywords: *Microstrip patch antenna, multiband, Compact, ring coupled.*

I. INTRODUCTION

Since the inception of wireless networking and portable devices, the need for light weight antennas is growing. Because of the low profile and planar configuration, the Rectangular Microstrip Patch Antenna (RMSA) is used widely. Nevertheless, the size of the low frequency RMSA becomes large and the bandwidth is small. Many techniques were published in literature to obtain both compact and broadband antennas such as using high relative permittivity substrates, shorting pins at appropriate position inside the radiating patch and etched slits etc. [1-5]. Advancements in the wireless communication field require RMSAs which provide dual /

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(57) Abstract :
SHORT-TIME CONTACT BELL PUSH SWITCH The present invention relates to a bell push switch (200) which is configured to keep the electrical contact points (330, 335) connected only for a short fixed duration and to disconnect the contact points (330, 335) even if the push button (205) is kept pressed for longer period. When the push button (205) pressed by a finger, an inner actuator (350) is pressed down until a terminal point, at which point the actuator (350) is released to return to its unpressed position slowly under the dampening action of a high viscous fluid (390) on a pinion (360) driven along a rack (355) connected to the actuator (350). The slow returning of the actuator (350) delays the breaking of the contact points (330, 335), thus providing a short time of contact between two electrical terminals (212, 227) of the switch. Fig. 3

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(54) Title of the invention : FOOT OPERATED HAND SANITIZER DISPENSER

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(57) Abstract :

Abstract FOOT OPERATED HAND SANITIZER DISPENSER The present invention relates to a foot operated hand sanitizer dispenser (300) comprising a slender vertical tube (310), a foot pedal (380), a container (320) containing the sanitizer liquid (345), a DC motor pump (410), a motor driver (450) interfaced with a microcontroller (440), and a battery (420). The foot pedal (380) is pivotally mounted on a fulcrum (475) at the lower end of the vertical tube (310). The lower end of the vertical tube (310) is provided with a non-return valve (315) that is adopted to prevent the sanitizer liquid (345) in the vertical tube (310) from draining back into the container (320). The microcontroller (440) is configured to receive power from the battery (420) by turning on a push-to-close power switch (430) for a predefined duration while the foot pedal (380) is pressed downward by a user. When the user presses down the foot pedal (380), the switch (430) is closed to power the DC motor pump (410) for a short duration, during which the sanitizer liquid (345) is pumped up to push out a small quantity of sanitizer (347) that is already within the slender tube (310) due to earlier pumping action. Fig. 3

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(54) Title of the invention : HAND-HELD UV LIGHT SANITIZER

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(57) Abstract :

A hand-held UV light sanitizer 200 for sanitizing a surface 230 safely by throwing the UV light on them from a UV light tube 380 mounted within a cuboid enclosure 255 is disclosed. The sanitizer 200 can be held with one hand while sanitizing surfaces. The distance of the UV light source from the surface 230 being sanitized is measured by using ultra-sonic sensors 350, 370. A camera 290 on the top of the sanitizer 200 is used along with image processing capability of a micro-controller 750 to find if any human face is recognized. The UV light is switched on only if the distance is less than a predetermined ˜on™ distance value, and a human face is found in the image seen by the camera 290. The UV light is switched off if the distance is more than a predetermined ˜off™ distance value, or a human face is not found in the image seen by the camera 290. While being used, two flaps 240, 250 move out to the sides exposing the UV light tube 280, 330, and prevent any UV light reflected from the surface 230 from going towards the user. In the retracted position, the flaps 240 (610), 250 (620) cover the UV light tube 380 and protect it from physical damage.

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