3.2.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during the year (2020-21)

National Conference Proceedings

0	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	ISBN/ISSN number of the proceeding	Whether at the time of publication Affiliating Institution Was same Yes/NO	Name of the publisher	Page No.
1	G.Sudarsana Reddy	--	Influence of Cerium Oxide Nano particles Additive Blended in Calophyllum Inophyllum Biodiesel Used as Alternative Fuel in the Diesel Engine	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	1
2	Dr. G. Ramesh	--	Design and Performance Evaluation of a vortex tube form by Copper Material	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	2
3	G. Sudarsana Reddy & P. Kumar	--	Cutting forces in orthogonal metal cutting using Al2O3 coated and uncoated Tungsten carbide tool	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	3
4	Dr. K VN VN Rao,	--	AHP-GRA based rescheduling decision making in a supply chain -A Case Study	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	4

5	G. Suresh	--	Machinability Characterization of Sissal/ Borassus Epoxy Hybrid Composites	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	5
6	Y. Bhargavi	--	Fabrication of Hollow Pipe & Rectangular Plate using CFRP	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	6
7	M. Venkatesulu	--	Experimental Investigation on Mech. Behaviour of Hybrid Composites	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	7
8	P. Bhaskara	--	Characterization on Mechanical Properties of Aluminium 6061 Alloy with Reinforcement Elements	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	8
9	Dr.K.V.N.V.N.Rao	--	Experimental investigations of mechanical properties in glass epoxy composites filled with TiO2 particles	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	9
10	P. KalaiSelvi	--	A Review on Failure of Piston in IC Engines	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	10
11	G. Suresh & P. Kumar	--	Crash Analysis of a Bumper with Different Materials by Using Hyper mesh and LS-Dyna	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	11
12	J. Chandra Babu, S. Prathap	--	Emotional reorganization and drowsiness detection	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	12

13	K. Dhanamjay, G. Lokesh		Notifying the accident zones using Google maps	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	13
14	K. Reddamma	--	An Outline on Focal conception of Artificial Intelligence	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	14
15	A. Shailaja, B. Bharathi	--	Traditional Approach for comparing A. Financial Brand Communication analysis with a big data analytics technique	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	15
16	Dr. G. Prabhu Kanna, B. Ramesh,	--	Comparative Analysis of various Machine Learning Algorithms for prediction of diabetics	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	16
17	Dr. D. Udaya Suiya Rajkumar, B. Ramganesh,	--	Compare and Match Approach for preventing Sybil attacks in Wireless Sensor Networks	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	17
18	Dr. R. Madonna Arieth, Dr. P. Manivannan	--	Congestion Control Strategy of GSTEB Routing Protocol for wireless Sensor Network using Machine Learning Clustering Algorithm	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	18
19	P. Bhanu Prakash, P. Ramesh	--	Reviewing Big Data Integration to find fair discovery approaches and Methods	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	19

20	G.Elaiyaraja	--	Guided Filter based on Dark Channel Prior for De-hazing of Forest Image	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	20
21	Mr. G. Siva Koteswara Rao	--	Detection Of Exudates Using Adaptive Histogram Equalization	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	21
22	P. H. Chandra Mouli	--	Ultra-Wideband (UWB) Antenna With Band Notch Characteristics Using Double inverted EBG Filter	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	22
23	G.Sivakoteswarrao	--	Implementation of an Automatic Pedestrians Road Crossing Detection System Based on Recent Microcontroller System	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	23
24	K. Jayasree	--	Performance of Enhanced Particle Swarm Optimization and Random Forest Classifier in Face Recognition	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	24
25	Boda Saroja	--	A High-Speed Block Based New Approximate Adder With Carry Speculation	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	25
26	M. Tulasiram	--	Heart Beat Detection and Monitoring Using IoT	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	26
27	N. Kiran Kumar	--	Location Based Garbage Monitoring System For An Green Environment	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	27

28	Tejaswini p	--	Voice Control Arduino Robot	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	28
29	R.Rani	--	Enhance Sensitivity Of Bangle Handwritten Digit Recognition Using Ten Layered D-Cnn Model	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	29
30	Dr. S. Muni Rathnam,	--	Fusion of Multi Spectral Satellite Images to Improve Volcanic Hot Spots Detection	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	30
31	Y Mahesh, S Mohammed Noumaan		Algorithm for Digital Image Watermarking Using Learnable Features of Conv Net	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	31
32	P.H. Chandra Mouli	--	Implementation of Sense Amplifier using Flip-Flops for Memory Applications	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	32
33	V. Bharathi	--	PIC Controlled War Field Spy Robot with Bomb Detection and Night Vision Wireless Camera by for Android Application	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	33
34	Dr.A.Hema Sekhar, Mrs.A.Haritha	--	Hybrid Optimization Techniques for Analyzing the Performance of Transmission System Using Novel SVC Model	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	34

35	S.Venkat Rao	--	Application of Multi-Level Converter for Fast Current Control in Small-Scale DC Power Network	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	35
36	P.Chaitanya Theja	--	Three-Level Power Balancing for Electric Vehicles	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	36
37	B.V. Arun Kumar	--	Performance Analysis of BLDC Motor drive using Fuzzy and ANFIS controllers	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	37
38	B.V. Arun Kumar	--	Multi Quadrant Operation of BLDC Motor Drive	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	38
39	T.Ramesh, M.Murali	--	A Novel Quad copter UAV Based Fertilizer And Pesticide Spraying System	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	39
40	G. Omkar, K. Sarumathi	--	Study on Impacts of Poor Drainage Related Performance of Flexible Highway Payments	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	40
41	Vinoth Kumar. M, P. Ram Prasath	--	Review on Intrinsic Self-Sensing Behaviour of Concrete for Health Monitoring of Structures Integrated with Self Diagnosing Material	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	41
42	B. Ramu, B. Yugandhar	--	Assessment of Concrete Strength with Replacing Miscellaneous Coarse Aggregates	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	42

43	Dr. KR Sekhar	--	Numerical Simulation of Lid Driven Cavity Flow Problem with aspect ratio effect and Runge-Kutta fourth order method	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	43
44	Dr. B.Nagabhusanam Reddy, Dr. KR Sekhar	--	Soret and Dufour effects on unsteady MHD free convection in a Walter's-B Visco elastic flow past a semi-infinite vertical plate	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	44
45	Dr. KR Sekhar	--	Buoyancy effects on MHD Flow Over a permeable stretching sheet through porous stratum	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	45
46	D. Manjula	--	Explicit finite difference analysis of Carson fluid flow in parallel plate channel with moderate values of Reynolds number	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	46
47	M.C. Sreelakshmi	--	Soret and Dufour effects on MHD free convection flow of heat and mass transfer over a stretching sheet in a porous medium with heat source/sink	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	47
48	K. Baby	--	To find split strong dominating set of an interval graph using algorithm	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	48

49	Dr. Chinttala Swaroopa	--	Electro analysis and determination of Maneozeh pesticides using polyaniline modified electrode as Nano sensor	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	49
50	D V Sai Sireesha	--	Bioactive Compounds in Mango Peels and Their Extraction	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	50
51	V. Lavanya	--	Recent Applications in Biosensors- A Review	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	51
52	S. Kareemulla	--	Nano materials for the Removal of Heavy Metals from Wastewater-A Review	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	52
53	Dr. K. Chaitanya Kumar,	--	Structural, optical and magnetic properties of Ni doped ZnS nano particles	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	53
54	Dr. U. Sasikala,	--	Effect of PEG on (PEO+PEME+NaIO4) Complex Polymer Blend Electrolyte by using (PEG) as a Plasticizer	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	54
55	V. Sreedhar, B. Kavitha	--	Thermally Evaporated Cu2O Thin Films for solar cells	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	55
56	N. Subramanyam	--	Luminescence Properties of Ho3+ Ions Doped BaGd2Ti4O12 Ceramics for Photonic Applications	CRATE 2020	978-93-80831-42-8	yes	Students Help line Publishing House	56

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Influence of Cerium Oxide Nanoparticles Additive Blended in Calophyllum Inophyllum Biodiesel Used as Alternative Fuel in the Diesel Engine

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***Abstract*— Energy is a crucial factor, which influence the country's economic growth and social development. The major energy contributors are fossil fuels and play a significant role in the energy scenario, but these fossil fuels are non-renewable, cause pollution and are very limited in the resources. Due to continuous extraction and consumption of fossil fuels, recently biodiesels are chosen as an alternative fuel in diesel engines. The present experimental work aims on the influence of Cerium oxide (CeO_2) nanoparticles as additive doped (as 30 ppm, 60 ppm, 90 ppm and 120 ppm) in Calophyllum inophyllum biodiesel blend B20 in a diesel engine. The experiment results that biodiesel blend B20 at 90ppm of CeO_2 nanoparticles additive obtained a significant reduction in emissions like nitrogen oxide, unburnt hydrocarbons, carbon dioxide and smoke. However, brake specific fuel consumption decreased with significant from increase brake thermal efficiency by adding of CeO_2 nanoparticles from 30 ppm to 90 ppm. B20 biodiesel blend with doping 90 ppm of CeO_2 nanoparticles as optimum blend when compared with the other biodiesel blends.**

Keywords*— *Biodiesel, Calophyllum inophyllum, Cerium oxide, nanoparticles, Performance, Exhaust emissions.

I. INTRODUCTION

World oil supplies are reaching the point where the demand for fossil fuels may outstrip the supply, and the oil prices are increasing significantly. Besides, combustion of petroleum-based oils and its derivatives such as petrol, diesel, etc., discharges greenhouse gases into the atmosphere causing global warming. However, the total petroleum reserves are depleting day by day due to indiscriminate extraction and lavish consumption (A.K. Agarwal, 2007). Biodiesel can be seen as one alternative that can help to reduce the sustainable impacts of these events. Every country has its individual priorities and vision for growth, so energy is the mainstay for all civilized countries in the world.

Biodiesel can be prepared from various renewable feedstock vegetable oils both edible and non-edible oils (Ambarish Datta et al., 2012; Girdhar Joshi et al., 2017; Neuling et al., 2017; Ganesan et al., 2019). As the biodiesel properties are higher viscosity, high oxygen content, low smoke emission and lesser pollutants from engine exhaust. And the emission characteristics of biodiesel are better than diesel fuel except for NO_x emission (Selvan et al., 2009). Biodiesel is a substitute to diesel fuel for diesel engines, because of its characteristics such as rich in oxygen content, decreased smoke emission and dilute pollutants levels evolved from the exhaust of engines such as CO, Smoke, unburned hydrocarbons and particulate matter. It contains an excess of oxygen content than diesel fuel, as it aids in better combustion of the fuel. Also, high temperatures are formed in the combustion chamber by inducing more NOx emission during the combustion process. Biodiesel is a clean fuel because it has no sulphur content, no aromatics, and it has nearly 10 % of oxygen, which aids biodiesel to burn completely. Nanoparticles blended with biodiesels shown better thermal properties as the higher surface area to volume ratio of the nanoparticles also results in higher oxidation of hydrocarbons and which acts as an oxygen buffer to reduce NOx (Sadhik Basha et al., 2011).

Many researchers used different additives to biodiesel fuelled in diesel engine, found reduced emissions and increased performance of the diesel engines (Rashedul et al., 2014; Can et al., 2016; Mirzajanzadeh et al., 2015; Arul Prakasajothi Mahalingam et al., 2018). V Sajith et al., 2010 conducted experiments on diesel engine fuel with cerium oxide as nanoparticles in biodiesel dosing in 20ppm, 40ppm & 80ppm and had showed increased brake thermal efficiency by 1.5% and reduction in NOx and HC emissions by 30% and 40% respectively. Ajin et al., 2011 experimentally observed that the Cerium oxide as nano-additive in diesel improved the brake thermal efficiency by and a reduction of HC and NOX emission. Amongst the nanoparticles additives, Cerium oxide has exhibited a high catalytic activity due to its high surface-to-volume ratio, which reduces the emissions and improves the brake thermal efficiency (Ajin et al., 2011; Selvan et al., 2009).

II. ABOUT CALOPHYLLUM INOPHYLLUM

Calophyllum Inophyllum is an Indian Laurel tree has excellent potential for biodiesel. The tree size is medium to large, the height of the tree is 8–20 meters with irregular

Design and Performance Evaluation of a vortex tube form by Copper Material

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Abstract. Refrigeration plays an significant role in preliminary countries, chiefly for the preservation of food, medicine, and for air conditioning. Conventional refrigeration systems are using Freon as refrigerant. And is the potential cause for depleting Ozone layer, extensive research is going on alternate refrigeration systems. Vortex tube is a non – conventional cooling device, having no moving parts which will produce cold air and hot air from the source of compressed air without effecting the environment. When a lofty pressure air is creatively inject into the vortex chamber, a burly vortex flow will be fashioned which will be crack into two air streams. The present work mainly focuses on Design and fabricating the vortex tube of Copper material, after fabricating, the performance of the Vortex tube is evaluated for different diameters of orifice and inlet pressures. Cooling effect and Heating effect are selected and COP as performance measures. The main objectives of the present work are described below:

To determine the suitable orifice diameter for getting Cooling effect and Heating effect.
To find out the suitable inlet pressure for obtaining Cooling effect and Heating effect.
To validate the best material for the chosen performance measures of COP.

Key words: Vortex Flow, Orifice, Tangential Nozzle, Vortex chamber

1. Introduction

The vortex tube was made-up by a French physicist named Georges J. Ranque in 1931 while he was studying processes in a dust unconnected cyclone. It was highly unpopular during its conception because of its apparent inefficiency. The copyright and idea was deserted for numerous years awaiting 1947, when a German engineer Rudolf Hilsch customized the plan of the tube. Since then, many researchers have tried to find ways to optimize its efficiency. Until today, there is no single theory that explains the radial temperature separation. The separation of gas mixtures, oxygen and nitrogen, carbon dioxide and helium, carbon dioxide and air with the vortex tube(VT) was reported in 1967 by Linderstrom-Lang and in 1977 by J. Marshall. In 1979 steam was used as working medium by Takahama. In 1979, two-phase propane was used as the working medium by Collins. In 1988 Balmer applied liquid water as the working medium. It was found that when the inlet Pressure is high, for instance 20-50 bar, the energy separation effect still exists. So it proves that the energy separation process exists in incompressible (liquids) vortex flow as well. In 2004, natural gas was used as working medium and with the VT natural gas was liquefied by Nikolay Poshernev.

The entire year 1928:

Inside the year1928, a French physicist called George Ranque ran a vortex-type pump and accidentally invented a different sort of vortex the tube with the vortex. While analyzing his invention, he saw who's was obviously a promise product wherein he attempted to market as vortex tube. Unfortunately, individuals those days didn't have any use for such powerful and functional device.

In 1945:

Seventeen years later, in 1945, that invention exited hibernation when another physicist, known as Rudolph Hilsch who write articles in the journal, "Wirbelrohr" in regards to the device. He was quoted saying the functionality with the tube of vortex being a mechanical device. In the long run, it was attributed several applications and uses that has been found by the economic sector as most useful.

Cutting forces in orthogonal metal cutting using Al_2O_3 coated and uncoated Tungsten carbide tool

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***Abstract* — The outcome of machining boundary on cutting forces during machining of C-45 steel workpiece using Aluminum oxide coated and uncoated Tungsten carbide tool for experimentation and Numerical. The experimentation conveyed out for measuring of surface roughness on workpiece and tool was performed using surface roughness tester and resultant force were measured using Kistler dynamometer. The experimental work is carried with L9 orthogonal design to evaluate the effect of machining parameters on the surface roughness and resultant forces with coated tools(TIN and Al_2O_3). Analysis of 2D unsteady state forces and surface roughness in a turning process is carried out by using Marc FEA code. It was identified that smallest tool wear with Al_2O_3 coated tool. It covers a study on cutting forces and surface roughness of modeling and Numerical in turning of workpiece using coated and uncoated carbide tools by finite element technique. Finally higher cutting forces are developed at lower process parameters and coated tools was identified the less cutting forces.**

Keywords* — *Coated tool, Finite element method, hard material, Marc

I. INTRODUCTION

An Analysis of literature defines the study of the turning process's cutting forces and surface roughness with the aid of finite element analysis and experimental re-sults.Distinctive methods for numerical modeling of metal cutting processes is Lagrangian and Eulerian practices, as well as the combination of both is called a random Lagrangian– Eulerian formulation [1]. It should be perceived that all these approaches are mathematically correspondent. Mesh is involved to the work piece is the foremost technique of Lagrangian formulation cast-off in this study. Also, the finite element analysis was performed by Johnson-Cook's essential equation with 3 completely different sets of fabric constants (found by the applying of many methods) is enforced within the metal model to check the behavior of Ti6Al4V alloy throughout the machining method in standard and high-speed regimes [2]. Demand for higher productivity and sensible quality for machining components has encour-age several researchers to check the consequences of machining parameters victimization FEM simulation victimization either two- or three-dimensions version [3] Gurjeet Singh et al [4]. evaluated the performance of multilayer coated inorganic com-pound inserts with different {totally completely different completely different} thicknesses were by experimenta-tion investigated victimization Taguchi L18 orthogonal array that is obtained from the turning operation on hardened AISI D3 Steel victimization different Al203/TiC mixed ceramic tools. Experiments were conducted on the traditional shaping machine and output responses like surface roughness and Material Removal Rate (MRR) square measure determined. They found that to realize most MRR and minimum surface roughness, parameters like coating layer thickness and feed rate plays a serious role.Dr. Maan et al [5]. studied the consequences of coated layers, on the cutting force in orthogonal turning method victimization AISI 1010 steel victimization four kinds of inserts as well as a coated tool with TiN, Al203, TiCN, uncoated tool victimization with the special FEA code DEFORM-2D. The turning tests were performed at 5 completely different cutting speeds (45, 65, 97, 145, and 206 m/min.), whereas feed rate and depth of cut were unbroken constant at (0.2mm/rev.) and (1.2 mm) severally each numerically and by experimentation. They found that numerical work offers satisfactory results compared with experimental, the most effective cutting speed that provides minimum cutting force is 206 m/min.K. Venkatesan et al [6]. investigated the influence of cutting parameters on machinability of a Ni-Cr alloy, alloy 625, with coated inorganic compound inserts (PVD A1TiN). In his work, alloy 625 is taken and supported Taguchi's L9 DOE orthogonal array, turning process experiment is conducted at completely different stages of cutting speed, feed rate and depth of cut. The signal-to-noise ratio (S/N) ratio, (ANOVA the analysis of variance and multivariate analysis were used to seek out the best levels and to investigate the impact of the cutting parameters. The cutting force and surface roughness were measured to investigate the machining effects and located that surface roughness is greatly influenced by feed rate and followed by cutting speed.I.Ucun and K.Aslantas[7]. studied the effect of coating type on the cutting forces, tool stresses and temperatures when machining of AISI 4340 steel on a CNC lathe using two types of TiN/Al2O3 coated and uncoated tungsten carbide inserts. A Kistler piezoelectric dynamometer is used to measure the cutting force (Fe) and feed force (F). The orthogonal cutting tests were carried out feed rates of 0.05, 0.075, 0.1, and 0.2 mm/rev; the cutting speeds of 60, 120, 180, 240, 300 m/min Ersan Asian A. et al[8]. found that as cutting speed increase the tool wear decreases. To get minimum tool wear, the maximum cutting speed of 250 m/min and depth of cut 0.25 or 0.5 mm was maintained during the experimentation. The cutting parameters for ceramic tools

AHP-GRA based rescheduling decision making in a supply chain – A Case Study

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Abstract

Supply chain management is an activity to fulfill the need of the customer at competitive cost. The current paper studies the influence of the rescheduling priority rules to study the impact of the disruptive events and decision making of the rescheduling priority rules. Delivery performance, average delivery delay and waiting time of the product are selected as performance measures. Right-left shift rescheduling method is followed to evaluate the performance measures. Five priority rules are applied to sequence the jobs in the production schedule. Analytical hierarchy process (AHP) is used to weight the criteria and Grey relational analysis (GRA) to prioritize the rescheduling priority rules and select the best alternate to overcome the disruption. The case discussed in the paper clearly shows that, the AHP- GRA can be used effectively for the rescheduling decision making.

Key words: Rescheduling, priority rules, analytical hierarchy process, grey relational analysis, delivery performance

1. Introduction

In current decade, the competition of the business has expanded from the company to companies supply chain [1]. Order fulfillment, competitive advantage and business performance are the key measures of the supply chain. Customer centric manufacturing practice is associated with the considerable challenge for the present day business community [2]. The manufacturer has to pay the extra attention on the delivery performance, delivery delay, waiting time of the products, on time delivery and order fulfillment lead time [3]. Provision of the after sales service with the manufacturing system is an advantage to manage the delivery related issue. Real world manufacturing systems are associated with the many uncertainties due to the dynamic nature of the customer expectations and undependable supplier. Therefore, the production schedule requires revision in order to absorb the impact of the disruption [4]. The revised production schedule should meet the delivery assertion with suitable quantity of the order. Machine break down, Order cancel, order prepone, order postpone, rush order, supply delay, stochastic processing time are the important disruptions faced by manufacturing systems. Right shift rescheduling, affected operations rescheduling, left shift rescheduling are popular rescheduling methods which are widely reported in the literatures [5; 6]. Right and left shift rescheduling method can be applied to prepone and postpone the already scheduled jobs. Dispatching rule enabled rescheduling approaches are widely recognized for rescheduling decision making at the different stages of the schedule [7]. Multi criteria decision making also play crucial role to prioritize the various rescheduling options and facilitate for selecting best option to overcome the discrepancy raised due to the disruptive event without compromising the delivery promise [8]. Rescheduling activities in face of the disruption in house hold goods manufacturing industry is presented in this paper. The influence of the rescheduling priority rules on the performance measures are investigated under the incidence of various disruptive events. Multi criteria decision making method is employed to rank different rescheduling choice and pick the finest alternative to handle the disruption. The current paper is structured in to seven sections. Review of the closely related literature is briefed in section 2. Case description is presented in the section 3. Section 4 deals the experimental investigation of the case study. The analysis and discussion of the result is offered in the section 5. In section 6, the conclusions and future scope are summarized.

2. Litrature review

Vieira et al. [9], developed an analytical model to evaluate the performance of rescheduling strategies in parallel machine system. The proposed model is used for grouping the jobs in similar nature to avoid the unwanted setup. The result shows that, the proposed model is yields better performance. Petrovic and Duenas [10], proposed a two stage fuzzy logic based rescheduling model for parallel machine system of ceramic goods manufacturing company. Raw material shortage is considered as disruptive event. The first stage of the approach identifies the ideal time in the schedule whereas the second stage of the approach deals the recovery of the disruption. The result of experimental work shows that, the reschedule have good performance to handle uncertain disruptions. Liu and Zhou [11], investigated a rescheduling problem in an identical parallel machine system to handle the disruption due to the entry of rework. Polynomial time algorithm is applied to optimize the makespan and schedule stability. Numerical investigation results that the proposed algorithm is effectively handling the disruption. Yeung et al [12], discussed a two echelon supply chain system with manufacturing constraint in two machines for setting multiple common time windows. Pseudo polynomial dynamic algorithm is applied to optimize the profit, storage cost, size of the order, and transportation cost. Shortest processing time priority rule is followed for ordering the raw material. The result shows that, the pseudo-polynomial algorithm effectively computes the supply chain at faster time. Wasusri and Tanratpatkul [13], investigated the influence of rescheduling frequency on the supply chain performance in an apparel manufacturing supply chain. This supply chain covers three stages: knitting, dying and garment. It is found from the experimental results, the rescheduling will diminish the waiting time and raise the system nervousness. The most advantageous horizon for rescheduling is determined to optimize the supply chain cost. Altuger and Chassapis [14], applied a multi criteria decision making approach for choosing the preventive maintenance schedule in breed packaging line. The simulation model for the proposed work was developed by using Arena. Result of the case study indicates that, the proposed simulation model provides better utility. Tkindt and Billaut [15], conducted an extensive literature survey on the multi criteria decision making in the single, parallel and flow shop machining system. They

Machinability Characterization of Sissal/Borassus Epoxy Hybrid Composites

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***Abstract*— Over the last few years, ecological concerns have initiated a considerable interest in natural materials to produce green products. The use of natural fiber composites has increased due to the unlimited availability of natural fibers, their relative cheapness compared to conventional material such as glass, aramide fibers and multifunctionality. These composites are used in auto mobile industries, building insulated materials and aerospace application etc. The use of natural fibers like borassus, flabellifer fruit, flax, sisal, jute, etc., as replacement to manmade fibers in reinforced composites have increased now a days due to advantages like low density, low cost and bio degradability.**

In this paper, we fabricated required shape and size of strong HYBRID COMPOSITE MATERIAL and turned, milled in CNC lathe & CNC milling by varying the machining parameters and measure the surface roughness of the components by using the surface testing machine and analyzed by taguchi. Taguchi's method seems to be an efficient methodology to find the optimum cutting parameter.

Keywords—Sissal fiber, Borassus fiber, epoxy, hybrid composite, CNC lathe, X mill, Machinability property.

I. INTRODUCTION

A composite material is definite as a material system which consists of a combination of two or more different materials and these are impossible to solve in each other. The main uses of composite materials are high strength and rigidity, low density to compare with bulk materials and allowing for a weight decrease in the completed part.

A. Natural Fibers

The Natural fibers are substance which be formed with vegetation and animals that can be revolve into loop, wool or lash. The oldest fibers used by mankind are flax, strand and silk, but even jute and coir have been refined since remains. The increasing recognition of bio-composites or natural fiber composites (NFCs) are the ease of use and dependable quality of a large range of fibers, and their environmental hospitality is the main reason.

B. Sisal Fiber

Sisal fiber, an associate of the Agavaceae relations is an eco-friendly and ecological plant. Sisal fiber is strong, long, stable, flexible material and then it has been familiar as an important cause of fiber for composites shown in Fig 1. It is commonly traditional that the mechanical properties of fiber unbreakable polymer composites are forced by factors such as environment of matrix, fiber-matrix interface, fiber direction etc.

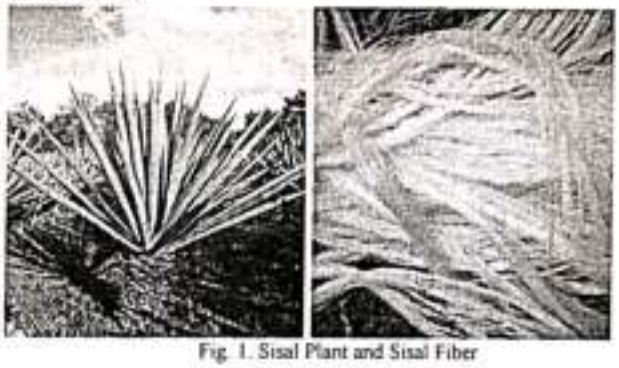

Fig. 1. Sisal Plant and Sisal Fiber

C. Borassus Flabillifer Fruit

Borassus fruit is a usual fiber and its scientific name is of Arecaceae relations and it's used meant forcreation strong ropes. The Borassus fiber is also having quite a few advantages like strong, more hard-wearing, elastic then the coir. The taking out of fibers involves the retting process followthrough the decortications. The borassus fruits are taken and wrapped up in the water tank for two weeks. Then they are taken out from the water and remove the outer shells of the fruits and the fibers were stripped from the stalks by hand, washed and dried in the sun. The borassus fiber extruded from fruit shown in Fig 2.

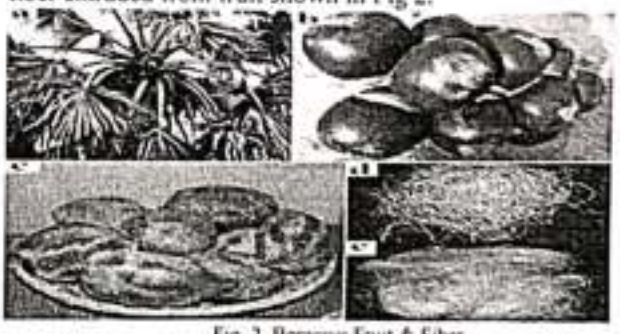

Fig. 2. Borassus Fruit & Fiber

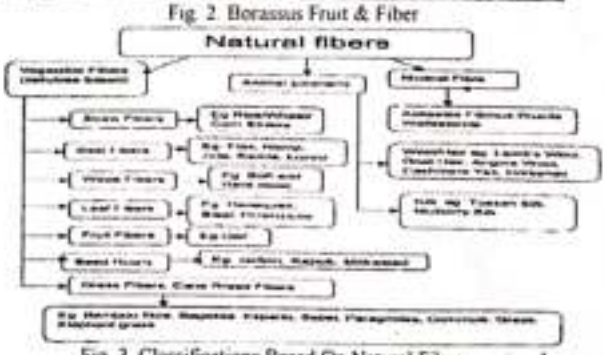

Fig. 3. Classifications Based On Natural Fiber

FABRICATION OF HOLLOW PIPE & RECTANGULAR PLATE USINGCFRP

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ABSTRACT: Composites have been found to be the most promising and discerning material available in this century. Fiber-reinforced polymer composite offers not only high strength to weight ratio, but also reveals exceptional properties such as high durability; stiffness; damping property; flexural strength; and resistance to corrosion, wear, impact, and fire. These wide ranges of diverse features have led composite materials to find applications in mechanical, construction, aerospace, automobile, biomedical, marine, and many other manufacturing industries. Composite materials like carbon fiber-reinforced polymers (CFRPs) present highly appealing material properties, as they can combine high strength with low weight. In aerospace applications, these properties help to realize lightweight designs that can reduce fuel consumption. Within the aerospace industry, the use of these types of materials has increased drastically with the introduction of a new generation of commercial aircraft. This increased use of CFRP drives a need to develop more rational manufacturing methods. In the present work, an attempt is made to fabricate the Carbon Fiber Reinforced Polymer laminates of flat plate and hollow pipe with different thickness.

KEYWORDS: *CFRP laminates, flat plate, round pipe.*

I Introduction:

A variety of different fiber performances incorporated with composite materials, with the combination of distinct base materials and manufacturing techniques, offer an enhancement in properties of materials over puremetals, polymers, or alloys, which make FRP composites benefiting for desired applications.Fibers as reinforcement in a matrix of a composite structure act as a load-carrying element. While the matrix material keeps fibers in their required position and orientation, it also facilitates stress transfer and protection from the environment. CFRP materials have been found to be superior to metals for a variety of applications where higher strength to weight ratio is required. In recent years, polymer composites have shown a great potentiality and superiority over a prevalent yet critical issue of friction and wear faced by conventional metals and alloys. For automobile and aerospace applications, CFRP is replacing existing unreinforced metals and alloys as it provides excellent mechanical, thermal, and electrical properties with enhanced wear and corrosion resistance to withstand harsh environments. The most common types of FRP used as reinforcement in the concrete structures are CFRP, GFRP, and aramid fiber-reinforced polymer (AFRP). These FRPs shows good resistance to shear and flexural stresses. For the concrete structures to withstand in a harsh environment, reinforcement materials need to be noncorrosive and nonmagnetic.

A major challenge in fabricating FRC material is the lack of fiber–matrix characterization cognition. For the application of FRPCs in variety of fields, understanding their constituent's significant material properties is necessary. Composite materials are fabricated with a number of different techniques, among which every technique is applicable for certain material. Effectiveness of manufacturing technique is dependent on the combination of type and volume of matrix or fiber material used, as each material possesses different physical properties, such as melting point, stiffness, tensile strength, etc. Therefore, manufacturing techniques are defined as per the choice of material.

More future research is intended to discover new composite structures with a combination of different variants and adopting new manufacturing techniques. The composition of CFRP is shown in the table 1.1. [3&4].

Material	Density ρ (kg/m^3)	Thermal conductivity K (W/m K)	Specific heat C_p(J/kg K)	Evaporation temperature T_v (K)	Latent heat L_v (kJ/kg)	Damage temperature T_d(K)
Carbon fiber Parallel/Perpendicular To fiber Axis	1850	50/5	1200	3573	43,000	2973
Polymer Matrix	1250	0.2	710	623–773	1000	443

Table 1.1: Material properties of CFRP

EXPERIMENTALINVESTIGATIONONMECHANICALBEHAVIOURO FHYBRIDCOMPOSITES

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ABSTRACT: -

Natural Fibers have an outstanding potential as reinforcement in thermoplastics. The objectives of this experiment are to evaluate the suitability of producing natural fiber composites using sisal &coir fiber along with glass fiber. This study deals with the preparation of composites by using matrix method in which good interfacial adhesion is generated by a combination of fiber modification and hand layup methods. Initially the sisal &coir fiber along with glass fiber were treated in order to improve resin fiber interfacial bonding. Generally, composites that contain treated fiber have a higher tensile modulus and greater flexural modulus than do untreated fiber composites. The goal of this project is which composites fiber best and related to other composites. In this type of project to determine mechanical properties and strength calculation identify this result. Composites with volumetric amounts of fiber in 40% & 50%were fabricated and they were arranged in randomly oriented discontinues form. Here using matrix orientation method for composite fibers with epoxy resin to check tensile strength, flexural strength, impact strength to give greater strength composite materials. It was observed that the effects of reinforcing epoxy resin matrix with the fibers caused the composites to be more flexible and easily deform due to high strain values and reduction of high resonant amplitude.

Keywords:Natural fibers,Sisal fiber,Coconut coir,Tensile strength,Impact strengthandHardness.

1. INTRODUCTION:

Nowadaysfiberreinforcedcompositesareinuseinavarietyofstructures,rangingfromspacecraftand aircrafttobuildingsandbridges.Thiswideuseofcompositesha–
beenfacilitatedbytheintroductionofnewmaterials,improvementinmanufacturingprocessesandde velopmentsofnewanalyticalandtestingmethods.Fiber-
reinforcedmaterialshavehighmechanicalproperties,andtheirstrength-to-
weightratiosaresuperiortothoseofmostalloys.Whencomparedtometalstheyoffermanyotheradva ntagesaswellasincludingnon-
corrosiveness,translucency,goodbondingproperties,andeaseofrepair.Theperformanceofapolym ercompositedependsnotonlyontheselectionoftheircomponents,butalsoontheinterfacebetweenth em.Inordertomeetthespecificneeds,sometimesitisnecessarytomodifythematrix,andthereinforce ment.Naturalfibersplayanimportantroleindevelopinghighperformingfullybiodegradable'green 'compositeswhichwillbeakeymaterialtosolvetheenvironmentalproblems.

NaturalfibersoffermanyattractivetechnicalandenvironmentalDuetotheexponentialgrowthofhu manpopulationonEarthwefaceenvironmentalproblemsmoreandmore.Now,in21st century,itisele

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CHARACTERIZATION ON MECHANICAL PROPERTIES OF ALUMINIUM 6061 ALLOY WITH REINFORCEMENT ELEMENTS (SiC+TiB2+MoS2)

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Abstract—

The expansion of manufacturing industries has somewhere led to the increase in the use of composite materials. Metal Matrix Composites (MMC) are the advanced and new age materials that find application in sectors like automotive, aerospace, rail components, defense etc. because of their light weight, high strength, good corrosion resistance and low thermal coefficient of expansion. Stir casting is the most economical process of producing metal matrix composites. It is the process in which the reinforcement is added to the molten metal by the action of stirring. In the present work an attempt is made to develop the hybrid composite of AA6061 reinforced with Silicon carbide, Molybdenum sulfide and Titanium Boride with Al6061 alloy. The investigation is conducted to observe the mechanical properties of specimen such as tensile strength, impact strength, Flexural strength and hardness exhibited by the composites respectively

Keywords— Metal Matrix Composites (MMC, Stir casting, Flexural strength, hardness

I. INTRODUCTION

A composite is commonly defined as a combination of two or more distinct materials, each of which retains its own distinctive properties, to create a new material with properties that cannot be achieved by any of the components acting alone. The constituent that is present in greater quantity in the composite is termed as matrix. It encloses the other constituent and essentially protects them chemically and thermally. The normal view is that the properties of the matrix are improved on incorporating another constituent to produce a composite. The second constituent referred as reinforcing phase or reinforcement, as it enhances or reinforces the mechanical properties of the matrix. Composites are two or more chemically discrete materials which when combined have enhanced properties over the individual constituents. One of the constituents is called the reinforcing phase, is in the form of fibers, sheets, or particles, and is embedded in the other constituent called the matrix (continuous phase). These type of materials could be natural orsynthetic.

II. LITARATURE SURVEY

A review of the aluminum metal matrix composite and its properties (2017) – Rohit Sharma, Kushal Kamboj, This journal deals with the addition of reinforcements such as graphite, fly ash, silicon carbide, redmud, organic material etc. The investigation shows that Al metal matrix composites are often replaced with other conventional metals for better performance and longer life.Studies on mechanical properties of Al-SiC metal matrix composite (2016)—Ashok KumarMishra, this Project work focuses onmetal matrix composites, which are mainly used in aeronautical and automotive applications.Wear behaviour of Al 6061/SiC metal matrix composite (2016)— Rajesh Kumar Srivastava, this paper mainly deals with Aluminum Al-6061 base composites, reinforced with SiC particles with mesh sizes of 150 and 600, which are produced using the stir-casting method and their wear resistance and coefficient of friction, were investigated in this study as a function of the applied load and weight fraction of SiC ranging from 5, 10, 15, 20, 25, 30,35 and 40.

III. EXPERIMENTAL SETUP

Before you begin to format your paper, first write and save the content as a separate text file. Complete all content and organizational editing before formatting. Please note sections A-D below for more information on proofreading, spelling and grammar.

Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to only one return at the end of a paragraph. Do not add any kind of pagination anywhere in the paper. Do not number text heads-the template will do that for you.

A. Stir Casting

Stir Casting method is a liquid metallurgy technique in which the second phase materials (reinforcements) are introduced into the molten matrix and allowing the mixture to solidify. Here, the critical thing is to create good wetting between the reinforcements and the molten aluminium or aluminium alloy, this is the simplest and most commercially used technique and known as vortex technique or stir-casting techniques.

Experimental investigations of mechanical properties in glass epoxy composites filled with TiO_2 particles

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Abstract

The present work describes the development and mechanical properties of a polymer composites consisting of glass fibre reinforcement, epoxy resin and TiO_2 particulate fillers. The newly developed composites are characterized with respect to their mechanical properties. Experiments are carried out to study the effect of stiffness properties like flexural test, impact test, hardness for these glass fiber epoxy based hybrid composites. Then these results are compared with epoxy glass fiber composites. The study reveals that there is slight increase in the stiffness properties of the hybrid composites.

Keywords

GFRP, flexural strength, impact strength, hardness

Introduction

Amar Patnaik et al [1] investigated the mechanical properties of glass fiber reinforced with epoxy resin filled with Al_2O_3, SiC and pine bark dust. The tensile strength was observed in the epoxy filled composites in the presence of these particulates have caused enhancement in impact and flexural strengths of the glass fiber composites. The hardness and flexural properties of the glass fiber composites were significantly influenced by the type and content of fillers used. Osman Asi [2] studied the mechanical properties of glass-fiber epoxy composite filled with different proportions of Al_2O_3 particles and compared with the unfilled glass-fiber reinforced epoxy composite were evaluated. By rising the Al_2O_3 particle size, the ultimate tensile strengths and shear strengths of the GFRP composites were effectively decreased. The flexural properties of the glass-fiber reinforced epoxy composites first improved with an increase in the content of Al_2O_3 particles and then decreased with a further increase in the content of Al_2O_3. A. Thiagarajan et al [3] studied the synthesis and characterisation of epoxy / TiO_2 hybrid nano-composites reinforced by glass fiber. The effect of TiO_2 will have strong interfacial bonding between the fibers and matrix. Compared to GFRP composites without addition of nano particles, the percentage of TiO2 nano particles increased tensile strength by 44 % and impact strength by 64.7 %. Sivabharathi V et al [4] studied the mechanical behavior of a glass fibre-reinforced polyester composite packed with three different filler contents of Al_2O_3 particles. Increasing the amount of filler further, it could be seen that the strength of impact was decreased but the hardness value improved. The tensile modulus and strength of GFRP filled particles was slightly less than the GFRP without filled particles. Ramesh K. Nayak et al [5] investigated the effect on mechanical performance of epoxy/glass fiber hybrid composites with different filled particles. Al_2O_3 filled epoxy composite increases the hardness and impact energy when compared with the other filled particles. Flexural strength, modulus and ILSS are greater in SiO_2 filled epoxy composite compare to other filled epoxy composites. From the available literature, an attempt has been in the present work the mechanical properties of GFRP composites are filled with TiO_2 particles and compared without filled particles.

A REVIEW ON FAILURE OF PISTON IN IC ENGINES

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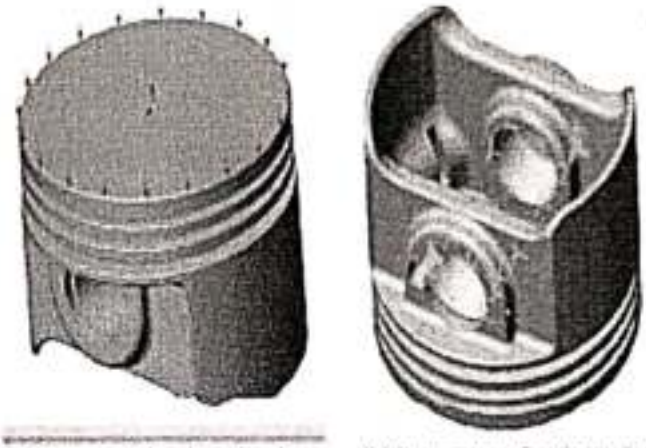
Abstract

The piston probably will be a heart of the engine and it'sin servicecircumstance is that the mainlytransientdamaging one amongst the key elements of the engine within the work. A piston possibly will be a slice of responding piston responding pumps gas compressors and gas chambers among substituterelative systems. It's the affectingpartially that's restricted by a barrel and is twisted air-tight by piston rings. During a piston, its inspiration is to swap force from mounting gas inside the barrel to the rotating shaft during a piston bar and in adding associating extremity rodPiston in the internal combustion (IC) engine is robust, energetically loaded tribo-pair that reciprocates endlessly at anecdotal temperature. Study has been made by a variety of researchers on piston design, dynamics, fatigue and wear at the border with other element in contact along with their effects on IC engines. It was originate that the friction coefficient increases with increasing surface roughness of liner surface and thermal presentation of the piston increases with augmented coating thickness. The free material modern due to bottomless scoring flanked by the piston and liner snowballs, leads to convulsion failure. .

Keywords: Piston, failure,I C Engine.

1.Introduction

The presentfashion in the land carrying and power manufacture is to enlarge IC engines of improved —power-capacityand —abridged emissionsl (to pursueindividual international intrinsic norms). Piston, piston rings and cylinder lining are significant components of an IC engine. The mainpurpose of piston is to convey the motion shaped by release of chemical energy of fuel to mechanical works. Piston rings animatedlyclose the gap flanked by the touching piston and the cylinder liner surface in order to avoid the break out of the combustion gases from the combustion chamber into the crankcase and the escape of the oil from the crankcase into the combustion chamber.



(a) Pressure at the piston head area (b) Restraints at the piston pin holes

Fig. 1. Typical engine piston [5]

The manufacturing of cylinders includes boring, honing and table honing which has conventional much notice by manufacturers in current times. The procedure of the surface changes which occurs throughout running of the engine is connected to the wearing action caused by the piston ring on the bore. This action takes place of —transitional topographyl where the surface generated exhibits the influence of the piston ring which modifies the machined surface. This has been made promising by improving the design of piston and reducing the failure i.e. scuffing, sculling, seizure of piston etc. The piston is one of the continuous moving parts of engine, is of pivotal significance. Piston has high dynamic loaded speed and serious reciprocating weight develop elevated inertia forces, which are unwanted.[18]

1.1The following factors may be measured for proper performance of piston in IC Engine:

1. The piston be supposed to have huge strength and heat battle properties to endure gas pressure and

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Crash Analysis of a Bumper with Different Materials by Using Hypermesh and LS-Dyna

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***Abstract*— Over the last few years, Bumper is one of the main parts which are used as protection for passengers from front and rear collision. The most important parameters including material, thickness, and shape and impact condition are studied for analysis of an automotive front bumper beam to improve the crash worthiness design in low velocity impact. In this project, a front bumper beam made of three materials: aluminum, plastic (glass mat thermoplastic) and steel (high-strength sheet molding compound) is studied by impact modelling to determine the deflection, impact force, stress distribution and energy absorption behavior. The mentioned characteristics are compared to each other to find best choice of material, shape and thickness.**

The results show that a modified SMC bumper beam can minimize the bumper beam deflection, impact force and stress distribution and also maximize the elastic strain energy. In addition, the effect of passengers in the impact behavior is examined. The time history of the calculated parameters is showed in graphs for comparison.

***Keywords*—Bumper, Thickness, Shape, Aluminum, Plastics, Steel, Kinetic Energy.**

I. INTRODUCTION

Car accidents are happening every day. Most drivers are convinced that they can avoid such troublesome situations. Nevertheless, we must take into account the statistics ten thousand dead and hundreds of thousands to million wounded each year. These numbers call for the necessity to improve the safety of automobiles during accidents. A car bumper is a front part of the car that covers the car's chassis. The cover of the car bumper is called fascia. An automobile bumper is the front most or rear most part, ostensibly designed to allow the car to sustain an impact without damage to the vehicle's safety. Car frontal and rear fascia is designed to prevent or reduce physical damage to the front or rear ends of passenger motor vehicles in collision condition. They protect the hood, trunk, grill, fuel, exhaust and cooling system as well as safety related equipment such as parking lights, headlamps and taillights etc. When the bumper is impacted by a stiff object, such kind may happen in a parking accident or in the legislative low speed impact pendulum test, then the bumper fascia alone may not be there to withstand the impact without considering the forces acting on it. Thus, there were four main strategic parameters being studied during the test. Firstly, how the type of material can affect the impact specifications and what kind of materials can be used as replacement in order to lower part weights. The effect of module of elasticity, yield strength and Poisson's ratio on impact behavior of bumper beam was under investigation in this section. Secondly, how the bumpers beam thickness can affect the impact specifications. Thirdly, how even small changes and modifications can result in easier manufacturing processes and lessening material volume without lowering the impact strength.

A bumper is a car shield made of steel, aluminums, rubber, or plastic that is mounted on the front and rear of a passenger car. When a low speed collision occurs, the bumper system absorbs the shock to prevent or reduce damage to the car. Some bumpers use energy absorbers or brackets and others are made with a foam cushioning material. The car bumper is designed to prevent or reduce physical damage to the front and rear ends of passenger motor vehicles in low-speed collisions. Automobile bumpers are not typically designed to be structural components that would significantly contribute to vehicle crashworthiness or occupant protection during front or rear collisions. It is not a safety feature intended to prevent or mitigate injury severity to occupants in the passenger cars.

Automotive bumper system plays an important role not only in absorbing impact energy but also in a styling stand point. A great deal of attention with in the automotive industry has been focused upon light weight and sufficient safety in recent years. Therefore, the bumper system equipped with thermoplastic and energy absorbing element is a new world trend in the market. The major point for the design of bumper system is summarized as a degree of absorption of impact energy in a limited clearance between back face of bumper and body parts of the vehicle. While experimental test is rather costly and time consuming, finite element analysis helps engineers to study design concept at an early design stage when prototypes are not available.

There are five bumper systems in common use today:

1) Metal face bar
2) Plastic fascia and reinforcing beam
3) Plastic fascia, reinforcing beam and mechanical energy absorbers
4) Plastic fascia, reinforcing beam and foam or honeycomb energy absorber
5) Plastic fascia, reinforcing beam, foam, and mechanical energy absorbers.

Emotion recognition and drowsiness detection

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***Abstract*— Human emotions are natural expressions that people tend to make naturally, instead of any conscious effort that is accompanied by the reflexing of facial muscles. Some of the common emotions are Happy, sad, surprised, anger and stable (normal) which a human face can make according to the different situations one may find itself in. We present the software which detects and recognizes faces as well as tells a lot more about that person which could be used to get feedback from customers or to know if a person needs motivation. The objective of the project is to be an affordable and efficient product. Artificial Intelligence & Digital image processing technology used to make the system in python. Detection of eye blinking is important in certain scenarios where to avoid any accident or mishappening like in vehicles or in security vigilance. As the system also recognizes the identity card, this is a simple feature wherein the camera installed is trained in such way that it firstly focuses on the card and recognizes its shape and color.**

Keywords*— *Emotion recognition; Drowsiness detection; Face recognition; Digital Image Processing; Artificial Intelligence

I. Introduction

The field of Artificial Intelligence and Digital Image Processing is growing in our country slowly and steadily. Many areas of industry have started using the various techniques and applications of AI and DIP. The project can be implemented for marketing purpose also, as it let us know the feedback of any product. It provides accurate results as well as are easy to be implemented and understood in the most common systems. Also, these features can be installed in a cost effective and efficient manner in schools or colleges or any other area where surveillance is required but lack of finances is a major factor. So, using our proposed project, surveillance could be provided which results help in maintaining a regular health check and to understand he emotion of a person at work place. It can also be used as feedback of workers after making some changes at work place.

Artificial Intelligence & Digital image Processing technology used to make the systems which contain face recognition, emotion recognition, drowsiness detection and id card detection. In face recognition conventional kNN algorithm is used. The given proposed work has shown us that the performance of face recognition technique can be improved much better by mixing Gabor wavelet and LBP for features extraction and the K Nearest Neighbour and Sparse Representation Classifier (KNN- SRC) for classification. We can understand a person's emotion if we are able to analyze it at different stages. For this purpose, we have an aim to develop a Convolutional -Neural Network (CNN) which is based on Facial Expression Recognition System (FER). The algorithm used for drowsiness detection detects the blinking of the eye through the camera installed using live video streams. The identity card detection is basically a feature which includes the use of 2 applications – First, the Shape Detection (Rectangle in this case) and Second, the color of the card.

II. Literature Review

A. Face Recognition

Facial recognition is basically a technique that is capable of verifying or identifying the faces from an image or a video. The camera is trained in such a way that when a face comes in front of it, the first task it does is to capture at least 10 frames of the face. During this time, the face can be seen covered with a BLUE colored rectangle which depicts that the frame capture is taking place right now. When the rectangular frame disappears, it means that the face has been captured by the camera from every possible angle that was visible to it and now those frames have been saved in the database.

The k-Nearest-Neighbor (KNN) is an algorithm which is a classification technique that is considered to be non-parametric which has been used to show that it is effective in certain applications.[2] This technique achieves high accuracy in those problems which have unknown and non-normal distributions.

So this is based on projection vectors to make the classification process faster by eliminating the need to find large numbers of distances. It also uses linked list in order to retain the immediate k-nearest neighbors. Simulation of the result gives the effectiveness of the proposed algorithm.

As already discussed above, kNN algorithm is that classification technique which has been proven to be effective in certain applications. The given algorithm can give a high accuracy result to problems that consists of different distributions.[3]

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NOTIFYING THE ACCIDENT ZONES USING GOOGLE MAPS

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Abstract

Now a day, no one in this world is prepared to look what's going on around them. Despite the fact that, in the event that any mishap happens nobody thinks about it. This is an aim to actualize an inventive answer for this issue by building up an Accident cautioning System utilizing android advanced mobile phone from the mishap zone. The principle target of this paper is to give data about mishap zone zones with talk cautions. This paper additionally centers around how the expectation calculation can be utilized to recognize the most significant risky spots. We could really improve security and wellbeing out and about. It could carry the advantages and effects on people in general. In this strategy for procedure we utilize the longitudes and scope's area of the clients for consistently and register if a client enters with mishap zone or not.

Keywords: Traffic accidents, Accident detection, Android Smartphone's, Real-time tracking, Accident zones, Latitude and longitude.

1. Introduction

An accident, also known as an unintentional injury, is an undesirable, incidental, and unplanned event that could have been prevented had circumstances leading up to the accident been recognized, and acted upon, prior to its occurrence. Most scientists who study unintentional injury avoid using the term "accident" and focus on factors that increase risk of severe injury and that reduce injury incidence and severity.

Android is a mobile operating system developed by Google, based on a modified version of the Linux kernel and other open source software and designed primarily for touch screen mobile devices such as smart phones and tablets. In addition, Google has further developed Android TV for televisions, Android Auto for cars and Wear OS for wrist watches, each with a specialized user interface. Variants of android are also used on game consoles, digital cameras, PCs and other electronics. Initially developed by Android Inc., which Google bought in 2005, Android was unveiled in 2007, with the first commercial Android device launched in September 2008. The operating system has since gone through multiple major releases, with the current version being 8.1 "Oreo", released in December 2017. The core Android source code is known as Android Open Source Project (AOSP), and is primarily licensed under the Apache License A key part of mischance insurance is to distinguish a growing medical aid crisis in a convenient way, and to caution the police and clinics crisis associations. This is the part of cautioning mischance zone and alert frameworks to help the people. To begin with they give a way to distinguish a creating mischance through either manual or programmed techniques and second, they caution the police, clinics, family and close helping focuses to enable them in that

An outline on Focal Conception of Artificial Intelligence

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ABSTRACT

Artificial intelligence is a technology which enables a machine to simulate human behavior. The goal of AI is to make a smart computer system like humans to solve complex problems. AI would have a low error rate compared to humans, if coded properly. They would have incredible precision, accuracy, and speed. It contains many subfields, including: Machine Learning, Deep Learning, Neural Networks, Computer vision, Natural Language Processing. In this paper, discussed about the relations between Artificial intelligence, machine learning and Deep learning . The main role of Artificial Intelligence makes it possible for machines to learn from experience, adjust to new inputs and perform human-like tasks.

Keywords:
Machine Learning, Deep Learning, Neural Network, Computer vision, Natural language processing,

I. INTRODUCTION

Artificial Intelligence is a set of sciences, theories and technology which includes mathematical logic, statistics, probabilities, computational neurobiology, computer, science.

It refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem solving.

It has played a major role in industry from last decades. It gives high performance computing ,great development and plenty of industrial products have been built with intelligent abilities. This technique improve the performance of industrial systems. whereas the practical applications in industry inspire the theoretical advances of artificial intelligence. It can solve real-world problems for better improve to the complexity of industrial tasks.

AI systems will typically demonstrate atleast some of the following behaviors associated with human intelligence: planning, learning, reasoning, problem solving, knowledge representation, perception , motion , and manipulation.

In the early days of artificial intelligence , computer scientists attempted to recreate aspects of the human mind in the computer. This is the type of intelligence that is the stuff of science fiction-machines that think, more or less, like us. This type of intelligence is called, unsurprisingly, intelligibility. A computer with intelligibility can be used to explore how we reason, learn, judge , perceive and execute mental actions.

Early research on intelligibility focused on modeling parts of the world and the mind in the computer.

Early models of intelligence focused on deductive reasoning to arrive at conclusions. One of the earliest and best known AI programs of this type was the logic theorist, written in 1956 to mimic the problem-solving skills of a human being. The logic theorist soon proved 38 of the first 52 theorems in chapter two of the principia mathematical, actually improving one theorem in the process. For the first time, it was clearly demonstrated that a machine could perform tasks that until this point , were considered to require intelligence and creativity.

Traditional approach for Comparing a financial Brand Communication Analysis with a Big Data Analytics technique

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ABSTRACT

Although large amounts of data are now available to companies, mere possession of these data is not sufficient, and, for better business decision, it is necessary to perform thorough data analysis. Nowadays, Social Networks Services (SNS) have become important data sources. The rapid growth of SNS has led to their wide use in various research trends in social sciences. In the present study, we aim to enhance the current understanding of the possibilities offered by social data for brand communication analysis in the financial sector. To this end, a traditional methodology and a digital methodology are used to investigate the brand image of financial entities. The traditional methodology is the Periodic Evaluation of the Image (PEI). The digital methodology is sentiment analysis, a machine learning technique for Big Data analytics insocial sciences using an algorithm developed in Python. The data are analyzed using both methodologies, and then their results are compared. The findings suggest that, while the results obtained using the method based on Big Data are consistent with the results obtained with the traditional methodology, the former method allows for an easier and faster data analysis.

KEYWORDS: Big data applications, Machine learning, Sentiment analysis, Social Network Services, Twitter.

1. INTRODUCTION

Recent years have witnessed a rapid grow thin the amount of data available about companies on the Internet. Social Network Services (SNS), an important source of such data [1], have come to be widely used in the emerging research trends in social sciences [2]. Likewise, technology, which favors the welfare of human beings and helps to improve the environment, has played an essential role in the development of our society [2]. Furthermore, due to the increase of access to the Internet worldwide, we can speak about a democratization of the access to information [3]. In 2015, there were 3,000 million Internet users. In Europe, more than 80% of the inhabitants aged between 16 and 74 years old accessed the Internet for different purposes [1, 4]. This access was made using different devices, although mobile phones were the preferred means, followed by laptops, desktops and, finally, tablets [3]. At present, smart phone sales are the highest worldwide and are expected to exceed those of personal computers (PC) soon [2].

Mobile phones are available to more than 90% of the global population, and mobile phone adoption rate advances at a great speed. It is expected that, in 2019, the penetration of the mobile Internet will be 71%, while the use per device will reach 71% of the population. This access to the smart phones, which now perform the previously reserved for computers and laptops, is modifying the way people communicate today [3]. Some of the tasks performed nowadays with mobile phones include online purchases, getting financial services, or getting access to information and news.

These changes should be taken into account in marketing research [4]. In general, users use traditional and digital media, and companies interact with their consumers through both traditional and digital media channels. However, new technologies open up new horizons for companies in terms of the development of their communication with customers and the creation of their brand image. In this context, it is necessary enhance our current understanding of and knowledge about the relationship between traditional and digital media and how the two influence consumer perceptions. To this end, it is necessary to use new techniques such asthose based on Big Data analytics. The ultimate goal of Big Data analytics is to find trends, correlations, patterns, insights, or consumer preferences to improve business decision-making process [5]. Big Data analytics is the process of analyzing large amounts of information organized in a structured or unstructured way. In order to perform this analysis, it is first necessary to search for a database, organize it with data text mining techniques, and, finally, proceed with its analysis in order to be able to base decision making on data. However, this three-step process has to face several challenges, particularly in the

Comparative Analysis of various Machine Learning Algorithms for prediction of Diabetics

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Abstract

Diabetes is taken into account together of the destructive and chronic disease that origin a rise in glucose. Diabetes mellitus or just sickness may be a disease caused due to the rise of blood glucose level. Many troubles might take place if the diabetes remains untreated and unidentified by the doctor. The obstacles are evacuating organ injury, typically resulting in chemical analysis, eye spoil that may end in visual impairment, or associate degree inflate risk for cardiopathy or stroke. Rise in machine learning approaches solves this essential drow back by diabetic prediction. An important aspect to be considered in all supervised Machine Learning models is how well they generalize to the unseen data. The ML techniques are assessed and compared only on the unseen test data. The aim of this paper is to develop a system which can perform better prediction of diabetes for a patient with a higher accuracy by using machine learning technique which provides advance support for predicting the accuracy rate of diabetes.

Key words: Diabetic, Machine Learning techniques, data selection and data preprocessing.

I. INTRODUCTION

Accordingly, many believe that AI can significantly and positively support the healthcare industry. AI can also be used to provide second opinions and minimize human errors, as physicians can suffer from fatigue, preoccupation, or inexperience and thus provide wrong diagnoses. . ML involves the research based study of statistical models and algorithms [1], that can progressively learn from data and accomplish desired performance on a specific task.

Machine Learning (ML) can be broadly categorized into supervised learning, unsupervised learning, semi-supervised learning, reinforcement learning [2], and active learning tasks. Supervised learning is the task of learning a function that maps input data to target labels. Common supervised learning algorithms include linear regression, logistic regression (LR), decision tree, random forest (RF), support vector machine (SVM), k-nearest neighbors (KNN) and Naïve bayes algorithms [3]. RF and SVM are among the most commonly used algorithms. SVM and RF algorithms are often used for each classification and regression tasks and the accuracy level is greater when compared to each other algorithms. The comparative model gives the best results for diabetic prediction and the result showed that the prediction system is

COMPARE AND MATCH APPROACH FOR PREVENTING SYBIL ATTACKS IN WIRELESS SENSOR NETWORKS

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This paper deals with the Detecting and Preventing Sybil Attacks in Wireless Sensor networks using compare and match position verification method with message authentication and passing method. The Sybil attack is a massive destructive attack against the sensor network where numerous genuine identities with forged identities are used for getting an illegal entry into a network. Basically a Sybil attack means a node which pretends its identity to other nodes. Communication to an illegal node results in data loss and becomes dangerous in the network. This chapter has proposed a combined CAM-PVM (compare and match-position verification method) with MAP (message authentication and passing) for detecting, eliminating, and eventually preventing the entry of Sybil nodes in the network.

Keywords: Detecting, Preventing, Sybil Attack, Illegal node, Authentication.

1. Introduction

The main objective of this paper is to design and develop an algorithm for detecting and preventing Sybil attacks in wireless sensor network. It is referred to CAMPVM with MAP. Creation of Sybil activity through use of the other personal identities is well known. Most of the existing research deals with the detection of the Sybil attack through verification of identities. Sybil attack is a matter of critical importance and consternation in network security leading to many fake identities that can cause disruption in the network [1]. Sybil attack occurs mostly during broadcasting and it functions without individual verification and identity comparison of communication entities. The attacker node can acquire many identities. That entity in the system can endeavour to influence the Sybil attacker due to the awareness of only others in each entity via messages in the communication channel [2]. The attacker nodes are launched inside and outside the route as well as wireless sensor networks. The monitoring node specially identifies the attacker node on a unicast as well as in a multicast scenario. Here, [3] author proposes an authentication framework which can ensure hindrance to or mitigation of security attacks on wireless sensor network.

A node or a device takes many identities that may not necessarily be lawful. It does not impersonate any node, but fast it only assumes the identity of another among several nodes, causing redundancies in the routing protocol. Sybil attacks degrade data integrity, security, and resource utilization. It can also perform storage, routing mechanisms, air resource allocation, and misbehaviour detection. In a sensor network hundreds of sensor nodes form the communication network. The wireless communication between these sensor nodes passes through a central station. These nodes communicate with a specified of nodes of a

Congestion Control strategy of GSTEB Routing Protocol for Wireless Sensor Network Using a Machine Learning Clustering Algorithm.

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Abstract

A Wireless sensor network is a key factor for the various fields. It comprises of a huge number of sensor node which can perform several operations of recognizing, dispensation, communication and power source. Data transmission from source to destination is a main aspects. At what time, of data transmission from one node to another node and in cluster head, congestion will arise. The unique characteristics of WSN such as for occurrence coherent nature of traffic to base station that happens through its many-to-one topology and collision in physical channel are main factors behind congestion in wireless sensor networks. The congestion will arise either in node or in resource allotment. Congestion affects the continuous flow of data, loss of information, delay in the arrival of data to the destination and undesirable usage of large amount of energy in the nodes So, it has to condense. There are quite a few Wireless sensor networks has a diverse protocol which will take care of Congestion Management. Here HPASCC (Higher Priority based application specific congestion control clustering protocol) lengthways complete token bucket algorithm place of priority queues. Here clustering of head selection CGSTEB using machine learning a resolution here. K-means cluster is used here. In case of occurrence of congestion, our proposal provides the way to deal it and to solve by what method to be improved. Simulation experiments performed that the proposed technique can significantly progress rises in the lifetime, energy, throughput and packet loss.

Keywords: WSN, HPASCCC, Congestion, K-means Cluster, Token bucket algorithm.

INTRODUCTION :

The nodes in the sensor network are comprising of very low powered sensor nodes. It is very tiny in size besides work promptly with imperfect battery-operated power which is deployed in large geographical area for its wide applications such as environment, sequence, process the sensed data and communicate the data within neighboring sensor nodes [1]. Heterogenous network has budding to improve network lifetime and also provide sophisticated quality network. Due to limited power battery will be exhausted. Thus, energy efficient routing protocol needs to allocate the balance energy burden between the sensor nodes [2,3]. Clustering comes under hierarchical routing protocols. It is unique finest protocol for energy limitations in the networks [4]. Clustering is done for the both modelized data routing services and energy efficiency in network. In cluster, nodes are grouped in which each cluster there will be CH is responsible for receiving information as of corresponding nodes and aggregated information are transmitted towards sink [5,6]. The consumption of energy is attained through

REVIEWING BIG DATA INTEGRATION TO FIND FAIR DISCOVERY APPROACHES AND METHODS

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ABSTRACT

Increasingly large numbers of embedded Smart phones, Sensors, PCs, Tablets, Computers connected to network, internet Medical data, Business transactions, Data are captured by sensors, Social media networks, Banking, Marketing, Government data, etc are generating enormous amounts of unstructured data. This data creates new opportunities to extract more value for the areas for which it is needed. Identifying the truthful data is difficult in the presence of noisy data contributing different sources through online social media that is facebook, twitter, what'sup and Instagram etc... and now a days it's a crucial task in the era of big data. This data creates new opportunities to extract more value for the areas for which it is needed. Recently, the Big Data is a challenging one by a dramatic increase of data from the physical world. One important property of Big Data is its wide variety, i.e., data about the same object can be obtained from various sources. Most of the time sources provide conflicted data for the same object. Unfortunately, it is notinfrequent that the data concerning a solitary item comes fromdifferent origins that could be loud, out-of-date, or evenerroneous. It is consequently of paramount significance toascertain such fights amid the data and to find out that pieceof data which is extra reliable.In this paper we are going to concentrate on the three main issues which cannot be described in the previous papers or in any literature. The "misinformation spread", "Data Sparsity", "trustworthiness". To address the above three challenges we develop scalable and Robust Trust Discovery Scheme and also a distributed framework which implements the proposed truth discovery scheme using queue in an HTCondor System in this paper.

1. INTRODUCTION

Big data is a new term, new-buzz word refers to the explosion of available information and massive amounts of very high-dimensional or unstructured data. According to the Definition of Gartner "Big data is high-volume, high-velocity and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making"[30]. The huge amount of unstructured data is generated from Smart devices, Medical data, Business transactions, Banking, Marketing, Government data, etc. It is the challenging one to extract true data from huge amount of variety of unstructured data.

Truth discovery plays vital role in the information age to identify the true data. On one hand it is an important role to find the accurate information more than ever, but on the other hand inconsistent information's have been generated due to the "variety " feature of big data. The truth discovery approaches are benefited in many applications in different fields. Examples include healthcare [1], crowd/social sensing [2,3,4,5,6,7], crowd sourcing [8], Information extraction knowledge graph construction and so on.

This paper discuss about a new scalable and robust approach to solve the truth discovery problem in social media applications and in big data. Online Social media provides a new sensing paradigm in the era of big data and here people can act as a ubiquitous, inexpensive and versatile sensors which results a spontaneously report their observations about the physical world. And also to overcome the misinformation SRTD deals with the copying, spamming, forwarding and self-correction.

The current big data era has witnessed various sources providing information on the same set of objects or events. The data inconsistency across multiple sources is an important research issue in many applications. The real world applications like weather situation analysis and health-care require techniques to identify which data sources are more reliable or what information is accurate. For example, when we identify the weather condition of a city, the inconsistent information may be obtained from multiple websites. As another example, different medical records on a patient may be found from different hospitals. Thus, it is highly demanded to automatically identify trustworthy information from conflicting data. For this task, truth discovery has been proposed to model the source quality and derive the truth based on a principle: the information from a reliable source is trustworthy and the source providing trustworthy information is reliable. By leveraging this principle, several mechanisms have been proposed in previous works for both static and dynamic data.

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Guided Filter based on Dark Chaneel Prior for De-hazing of Forest Image

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***Abstract*—Poor visibility in bad weather conditions, such as haze and fog, is a major problem for various applications of computer visualization. Thus, haze removal is highly required for receiving high performance of the vision algorithm. In this paper, we propose a new fast de-hazing method for real-time image. The transmission map estimated by an improved guided filtering scheme is smooth and respect with depth information of the underlying image. Experimental simulation results reveal that the proposed method achieves good de-hazing effect as well as real-time performance. The proposed algorithm, due to its speed and ability to improve visibility, may be used with advantages as pre-processing in many systems ranging from surveillance, intelligent vehicles, to remote sensing. Images captured under foggy or hazy conditions have low contrast and meager color. The proposed work is carried to get better visibility of hazy images. The proposed method is based on 'dark channel prior' to remove haze, along with guided filter.**

Keywords*— *Guided Filter; Dark Channel Prior(DCP) ; Peak Signal to Noise Ratio ; De-hazing.

I. Introduction

Haze is traditionally an atmospheric phenomenon in which dust, smoke, and other dry particulates unclear the clarity of the sky. The World Meteorological Organization (WMO) manual of codes includes a classification of horizontal obscuration into categories of fog, ice fog, steam fog, mist, haze, smoke, volcanic ash, dust, sand, and snow. Sources for haze particles include farming (ploughing in dry weather), traffic, industry, and wildfires.

Seen from afar (e.g. an approaching airplane) and depending on the direction of view with respect to the Sun, haze might appear brownish or bluish, while haze tends to be bluish grey. Whereas haze often is thought of as a phenomenon of dry air, mist formation is a phenomenon of humid air. However, haze particles may act as condensation nuclei for the subsequent formation of mist droplets; such forms of haze are known as "wet haze."

Images captured in bad weather suffer from low contrast and faint color. Recently, plenty of de-hazing algorithms have been proposed to enhance visibility and restore color. However, there is a lack of evaluation metrics to assess the performance of these algorithms or rate them and Images taken in outdoor scenes are always with poor visibility, especially in hazy weather. This is because the light reflected from scene objects is scattered in the atmosphere before reaching the camera due to the presence of aerosols such as dust, fog and water-droplets, and blended with the air light which is the ambient light reflected into the sight. In the long distance photography of hazy scenes, this process has a substantial effect on the taken image, leading to the loss of contrast and visual quality, which brings obstacles for many computer vision applications in surveillance, intelligent vehicles and outdoor object recognition, etc:. Haze removal, or de hazing, has thus been extensively studied in the computer vision field. The atmospheric scattering model is often used to describe the image formation of hazy scenes, and in the literature, more approaches have been proposed recently based on this model. Generally, due to the ambiguity of de hazing problem, those methods can be divided into three categories: exploring priors or constraints on hazy image, learning a model of image features and scene transmission, and using additional information of the image picture. The contrast and colors of images acquired in bad weather conditions are usually poor. Wang et al. proposed a simple method to remove haze based on a multi-scale decomposition method [20]. Through the Fourier spectrum and Hough transform we obtain the directional images which are then used to decompose the image to IMFs. By a linear mapping, we manipulated the detail, luminance as well as color to enhance the degraded images.

Photography of hazy scene typically suffers from low-contrast which degrades the visibility of the scene. The performance of single-image de-hazing methods is limited by the constraints or priors. Ren et al. presented an effective method for haze removal, which utilizes its retrieved correlated haze-free images as external information [19]. The correlated haze-free images are with scene prior offering scene structure and local high frequency information for de-hazing, although variations in viewpoints, scales, and illumination conditions exist. To utilize those reference more effectively, global geometric registration and local block matching toward the hazy input are performed to reinforce the spatial correlations. Based on the registration, different kinds of external information are estimated. In addition, we combine that additional external information with internal constraint and regularization for estimating scene transmission map. Experiments show that this algorithm can produce de-hazing results with enhanced the visual quality compared with other methods.

Image has important applications in many fields such as marine surveillance, environment monitoring and so on. The scattering effects of the atmospheric particles in the air play a main role of resulting in contrast reduction and color fading.

DETECTION OF EXUDATES USING ADAPTIVE HISTOGRAM EQUALIZATION

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Abstract:

Diabetic Retinopathy (DR) is the most frequent from of diabetic eye disease. It will typically affect people who have diabetes for a significant number of years. Retinopathy becomes particularly dangerous because it will affect all diabetics and, increases the risk of blindness, when it is left untreated. To avoid total loss of sight the ophthalmologist will treat the patients by sophisticated laser treatment, if effectively at an initial period. One of main symptoms of initial stage of Diabetic Retinopathy is analysis of Exudates. In this paper, a technique is proposed depending on morphological closing operations which are in image processing is used to identify exudates from retina image. At starting phase, the retinal image must be processed, where at first the image which is in RGB color format is altered to the Gray image and Median filter is performed to reduce the noise and subsequently Adaptive histogram equalization is performed to normalize the image. In subsequent phase, the exudates are identified using morphological closing operation and thresholding value is applied, proposed technique got better sensitivity and accuracy. At early stage, using mathematical morphology the exudates are identified and removed.

Keywords: Diabetic Retinopathy, Gray level, median filter, Adaptive histogram equalization, Morphological operation and thresholding.

I. INTRODUCTION

In a human eye Retina is the inner membrane. Diseases that take location inside the retina affect our eye–sight immediately.

Hypertension and diabetes mellitus are systemic illness in eye which causes a few pathological adjustments. Wecan give pathological facts using virtual pics of the fundus eye. Diabetic retinopathy, also referred to as diabetic eye ailment, is a scientific situation wherein harm happens to the retina due to diabetes and is a essential motive of blindness. The people who have had diabetes for 20 years or more might be easily affected. Eighty percent of humans have been stricken by diabetes. When the modifications in blood glucose tiers cause modifications in retinal blood vessels will produce Diabetic retinopathy. In some cases, these vessels will swell up and leak fluid into the rear of the eye. The early ranges of diabetic retinopathy can also occur without symptoms and without pain. A real impact at the vision will now not arise until the sickness advances.

Ultra-Wideband (UWB) Antenna With Band Notch Characteristics Using Double inverted EBG Filter

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ABSTRACT

In this paper a simple design, compact size, and low cost Ultra-Wideband (UWB) rectangular patch antenna with defective ground plane with WLAN (5.5GHz) band notched characteristics is proposed. A double inverted EBG filter structure is used to create band notch. In this paper, the antenna with dimensions of 18 X 30 X 0.8mm on FR4 substrate is designed. Here we get a bandwidth from 3.48 GHz to greater than 10.6GHz up to 13.48 GHz thereby there will be an increase in the wireless data transfer rate which is very useful for short distance wireless interact devices.

Keywords:

Electromagnetic interference (EMI), Notch Band width, WLAN, Ultra-Wide Band (UWB), double inverted EBG filter structure, Rectangular patch antenna

I. INTRODUCTION

At present, Ultra-Wide Band antenna design is more attractive wireless topic. In 2002, An Effective Isotropic Radiated Power (EIRP) spectral density of -41.5dBm/MHz with the unlicensed 10-dB band of 7.5 GHz (3.1 - 10.6 GHz) is designed by the Federal Communication Commission (FCC) which can used as UWB communications utilization for short distance communication [1]. UWB technology then becomes the most prolific wireless communication technology having the advantages of faster data transmission rate, simplicity, inexpensiveness, and low spectral power density, low power consumption, low interference, and easy installation. So, the UWB antenna research attained major importance in present communication. The challenges faced by UWB antennas are their return loss, radiation stability, impedance matching, compact size, low manufacturing cost and electromagnetic interference (EMI) problems. Since there are preexisting narrowband services which are existing frequency bands within the designated UWB bandwidth, particularly WLAN (5.5GHz) with these coexisting systems, The EMI problems have major impact on UWB systems. So, we need to design an UWB antenna with self-intrinsic filtering properties at preexisting service frequencies is necessary in order to remove the potential interferences. It is good to design intrinsically handle antennas rather than by a external band-stop filter device for minimizing the signal processing requirements, the footprint of the antenna system and the price.

Printed rectangular antenna fabricated on substrate with defective ground plane provide large impedance bandwidth which is useful for designing UWB micro strip antennas. Many printed antennas have been reported [2]-[5]. Since there exists some standard narrow bands in between the frequency range of UWB, Therefore, to prevent the UWB devices from the interference due to these standard narrow bands, band notched characteristics is introduced in UWB antennas. Lots of conventional techniques have already been proposed to design UWB antennas with band-notch characteristics. These include embedment of different types of slots on the radiating patch or on the ground plane, use of parasitic elements/patches, etching of split-ring resonators, use of tuning stubs, meandering of ground plane, use of folded strips, use of resonated cells on the coplanar waveguide, and use of embedment of strip lines. This literature is reported in [6]-[15]. In planar monopole, the cutting slots on radiating element, feed line and on the ground plane or to keep the parasitic elements near the radiator has to be done in order to get the band notched characteristics [16]-[29]. But these cuttings have major impact on the radiation pattern and time domain behavior of the antennas because of perturbation of radiating element. Here we are introducing double inverted EBG filter structure in between the ground plane and patch which is radiating to achieve UWB band notched antenna. At First, we design a simple compact UWB rectangular antenna which radiates over the frequency band of 3.48 GHz to greater than 13.48 GHz whose VSWR < 2, after that, double inverted EBG filter structure is implanted. The proposed antenna has been

Implementation of an Automatic Pedestrians Road Crossing Detection System Based on Recent Microcontroller System

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ABSTRACT:

Background and Objectives:

Pedestrian crossing, as an important part of transportation infrastructures, serves to secure pedestrian's lives and possessions and keep traffic flow in order. As a prominent feature in the street scene, detection of pedestrian crossing contributes to 3D road marking reconstruction and diminishing the adverse impact of outliers in 3D street scene reconstruction. Since pedestrian crossing is subject to wearing and tearing from heavy traffic flow, it is of great imperative to monitor its status quo. A pedestrian crossing detection and analysis system with high recall rate, precision and robustness will be achieved. This system works for pedestrian crossing detection under different situations and light conditions. It can recognize defiled and impaired crossings automatically in the meanwhile, which facilitates monitoring and maintenance of traffic facilities, so as to reduce potential traffic safety problems and secure lives and property.

Methodology and Discussion: Firstly, connect the LED's and resistors by soldering machine for 4 junctions i.e. red-4 green-4 yellow-4. After that we can connect 4 – servomotors and LED's. Connect it by using jumper wires to the atmega328p microcontroller and motor is connected to strips then by dumping the code into Arduino atmega328p microcontroller by using USB cable. Finally the output shown as if any one junction shown green led remaining junctions are shows red led .when this red led glows its automatically open the strips then pedestrian easily cross the road after completion strips are automatically closed simultaneously this process is continued for further junctions.

Performance of Enhanced Particle Swarm Optimization and Random Forest Classifier in Face Recognition

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Abstract—Feature Selection (FS) is used to reduce the number of features, removes irrelevant, noisy and redundant data, and results in acceptable recognition accuracy. It is the most important step that affects the performance of a pattern recognition system. For evaluation purpose, Experiments carried out using well-known face database. This paper presents a novel feature selection algorithm based on Particle Swarm Optimization (PSO). PSO is a computational paradigm based on the idea of collaborative behavior inspired by the social behavior of bird flocking or fish schooling. The proposed PSO-based feature selection algorithm is utilized to search the feature space for the optimal feature subset where features are carefully selected according to a well-defined discrimination criterion. Evolution is driven by a fitness function. Then after the classification is done by using Random forest classifier rather than KNN classifier.

Keywords— face recognition, particle swarm optimization, feature selection, Random forest classifier rather than KNN classifier

I.INTRODUCTION

Feature Extraction helps to extract salient features from signals and images for the purpose of retrieval [1], edge detection [2], recognition [3-5] and segmentation [6, 7]. The problem with extracted feature vectors is their huge dimensionality, which is called "curse of dimensionality" by theresearchcommunity.Itbecomessevereproblemwiththe application of multiresolution transforms such as discrete wavelet transform (DWT) or Gabor wavelet transform (GWT). Many approaches and algorithms were developed in the last decays such as principal component analysis (PCA) [8,9]andlineardiscriminantanalysis(LDA)[10]toovercome the dimensionalityproblem.

Particle swarm optimization (PSO) is a biologically inspired heuristic optimization algorithm developed by Kennedy and Eberhart [11]. Many variants of the PSO algorithmhavebeenintroducedsincethensuchasSPSO[12] CDW-PSO [13] DMSDL-PSO [14] HPSOWM [15]GPAM-PSO [16] and covariance PSO [17]. The simplicity of the implementation and adjustment of its parameters helped to give PSO a large attention. Researchers used PSO to solve diverse optimization problems in various fields of applications, such as edge detection [18], path planning [19], electrical load scheduling [20], and network security [21].

In this paper, we proposed to use PSO as a feature selection algorithm. Performance of the PSO approach is tested on face recognition problem. In face recognition applications, faces are images with high dimensionality.Feature extraction can be done using different algorithms. In holistic approaches, extracted features can be good for face representation but this doesn't guarantee the discriminability of those features. That is why applying feature selection will help in dimensionality reduction while reserving the features with the best discriminating ability.

The rest of the paper is organized as follows. section 2 presents the definition of particle swarm optimization algorithm.Section3describesthePSOapproach.Simulation resultsareshownanddiscussedinsection4.Finally,thepaper is concluded in the lastsection.

II.PARTICLE SWARM OPTIMIZATION

Kennedy and Eberhart introduced particle swarm optimization(PSO)algorithmin1995.ThePSOalgorithmis described asfollows:

Every single particle i in a population has the following properties: a recent location in an search region, x_i , a recent speed, v_i , and a local best location in inquest zone, y_i. The local best location y_i related to the location in search region where the objective function f provided the minimum calculated error for the particle i. The location produced the minimum error throughout all the yjs known as the global best location and is represented by y'. The local and global bestlocationsareupdatedusing(1)and(2),respectively.Itis assumed that the swarm has of s particles, thus i∈{1,…,s)

$$y_i(t+1)=(1\begin{cases} y_i(t) & \text{if } f(x_i(t+1)) \le f(y_i(t+1)) \\ x_i(t) & \text{if } f(x_i(t+1)) > f(y_i(t+1)) \end{cases}$$

$$y'(t) \in \{(y_0(t), y_1(t), \ldots, y_s(t)\},$$

$$f(y'(t)) = \min\{f(y_0(t)), f(y_1(t)), \ldots, f(y_s(t))\} \quad (2)$$

Throughouteveryiteration,everyparticleinthegro upis updatedutilizing(3)and(4).Therandomlygenerated$r_1$and $r_2$wouldbeusedtoinfluencethenatureoftheprocedure.For allmeasurement,j∈{1,…,n),letx$_{i,j}$,y$_{i,j}$andv$_{i,j}$bethe recentlocation,recentlocalbestlocationandspeedofthejthd imension of ithparticle. The inertia weight w is utilized to controltheconvergencebehaviorofthePSOandtheconstants $c_1$and$c_2$controlhowfaraparticlewillmoveinasingleloop. The speed update stepis:

$$v_{ij}(t+1) = wv_{ij}(t) + c_1r_{1j}(t) - x_{ij}(t)[y_{ij}(t) - x_{ij}(t)]$$

$$+c_2r_{2j}(t)-x_{ij}(t)[y'_j(t)-x_{ij}(t)] \quad (3)$$

The next position of the particle $x_i(t+1)$ is decided by adding the new velocity $v_i(t+1)$ to the particle's current position $x_i(t)$

$$x_i(t+1) = x_i(t) + v_i(t+1) \quad (4)$$

Each measurement value of speed vector vi is arranged to the range $[-V_{MAX},V_{MAX}]$ so in order to decrease the probability of the particle leaves the search region. The value of V_{MAX} is typically selected to be $k * X_{MAX}$, with $0.1 \le k \le 1.0$ [11], where X_{MAX} represents the field of the search region. Notice that the value of x_i is not limited to the range $[-V_{MAX},V_{MAX}]$; it is just restricting the greatest

A HIGH- SPEED BLOCK BASED NEW APPROXIMATE ADDER WITH CARRY SPECULATION

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***Abstract*— In any Digital signal processing applications adders plays a vital role. Here, a high speed and area efficient block-based carry speculative approximate adder with a new parallel prefix adder is proposed. Its structure is based on partitioning the adder into some non-overlapped summation blocks whose structures may be selected from different adders like the carry propagate or parallel-prefix adders. Here, the carry output of each block is speculated based on the input operands of the block itself and those of the next block. The block adder used in this is a modified parallel prefix adder which has less area and delay compared with existing Parallel prefix adder circuit. In this, we propose a high performance yet low power/energy consumed block-based carry speculative approximate adder structure which is called BCSA Adder. To reduce the critical path more, we suggest an approach to foresee the carry output of a block based on its signals as well as of the next block.**

***Keywords*— parallel prefix adder, BCSA Adder, power/energy consumption**

I. Introduction

Introduction In this approach, we propose a high performance yet low power/energy block-based carry speculative approximate adder structure which is called BCSA Adder. In this structure, the adder is partitioned into some non-overlapped parallel blocks, To reduce the critical path more, we suggest an approach to predict the carry output of a block based on its signals as well as of the next block. The structure has a low hardware complexity leading a low delay (on average, about one block) and a rather high quality. To achieve a lower accuracy loss, an error detection and recovery mechanism, which significantly reduces the output error rate, is proposed.

I. Related Work

The general architecture of *n-bit* speculative approximate adder enhanced by a carry predictor unit is illustrated in Fig 3.1. The add operation is performed by $\lceil n/l \rceil$ *l*-bit summation blocks working in parallel where *l* is the bit-length of each summation block. Summation includes an *l*-bit sub-adder, a Carry Predictor unit, and a Select unit. Selecting the carry output of the Carry Predictor unit leads to a shorter critical path and lower energy consumption. In this case, the dependency between the blocks is cut at the cost of some accuracy loss. Thus, the correctness of the add operation depends on the accuracy of the Carry Predictor unit, and also, the policy of the carry output signal selection. In our proposed structure, in the worst-case, the length of a carry chain is equal to two blocks .

In most of the approximate adders, the carry input of each block is chosen based on the input of the previous blocks. In this work, however, we propose a approximate adder that the carry input

II. PROPOSED WORK

A)Adders:

Adders are used for calculating the addition (or sum) of two binary numbers. Two common types of adders are the ripple-carry adder (RCA) and the carry look ahead adder (CLA). In an n-bit RCA, n 1-bit full adders (FAs) are cascaded; the carry of each FA is propagated to the next FA; thus, the delay of RCA grows in proportion to n (or O (n)). An n-bit CLA consists of n SPGs, which operate in parallel to produce the sum, generate (gi = aibi) and propagate (pi = ai + bi) signals, and connected to a carry look ahead generator. For CLA, all carries are generated directly by the carry look ahead generator using only generate and propagate signals, so the delay of CLA is logarithmic in n (or O (log (n))), thus significantly shorter than that of RCA. However,

Many schemes have been proposed by sinking the critical path and hardware complexity of the accurate adder. A speculative design makes an adder significantly faster than the conventional design.. An n-bit segmented adder is implemented by several smaller adders operating in parallel. Hence, the carry propagation chain is truncated into shorter segments. But their carry inputs for each sub-adder are

Heart Beat Detection and Monitoring Using IoT

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Abstract - This article reviews the emerging research on the exploitation of heartbeat data as biometric for human identification. A variety of methods for acquiring heartbeat signatures have been proposed and a variety of processing methods have been examined. We address the problem of biometric identification and verification by characterizing the three main factors that affect performance: individual variants, environmental variants and sensor variants. The ability to collect and process the signal, exploit the data for individual identification or verification and disseminate the information depends on these three factors.

I. INTRODUCTION

The heart is the most important component of the cardiovascular system. It weighs about 250-350 grams, that is, about the size of a fist. It hits about 2.5 billion times during a lifespan of 66–68 years. The heart is electrically stimulated by a special unit called the Chinese atrial node. This region produces a definite potential and discharges slowly, thus sending an electrical impulse through the atria. This electrical impulse is of a very sequential nature and responsible for systole and diastole in the four chambers, respectively. Recent years have seen a growing enthusiasm for portable sensors and today some devices are industrially accessible for individual human services, fitness and movement attention. Despite the field of specialized recreational fitness that flow and reflux devices take into account, analysts have also considered the use sensors.

This monitoring system meets the basic needs of generalized medical care for heart disease, also takes into account the cost to ensure that the general mode is as economical as possible.In addition, it can also be combined with real-time analysis algorithms to assess the health status of patients and give warnings about possible attacks in advance, which can make generalized medical care more intelligent.

II. INTERNET OF THINGS

The Web of things (adapted Web of things or IoT) is the interconnection of physical gadgets, vehicles (additionally called "associated gadgets" and "brilliant gadgets"), structures and different components, coordinated with hardware, programming, sensors, actuators and system network that permit these items to gather and trade information. In 2013, the Global Standards on Internet of Things Activity (IoT-GSI) characterized IoT as "the data society framework". IoT permits items to be distinguished and/or controlled distantly through existing system foundation, making open doors for more straightforward coordination of the physical world into PC based frameworks and bringing about more prominent effectiveness, precision and monetary advantage. When IoT is enlarged with sensors and actuators, the innovation turns into an occasion of the broadest class of digital physical frameworks, which likewise envelops advances, for example, savvy networks, keen homes, shrewd transportation and brilliant urban areas. Each thing is uniquely identifiable

LOCATION BASED GARBAGE MONITORING SYSTEM FOR AN GREEN ENVIRONMENT

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ABSTRACT: The Internet of Things (IoT) shall be able to incorporate transparently and seamlessly a large number of different and heterogeneous end systems, while providing open access to selected subsets of data for the development of a plethora of digital services. One of the main concerns with our environment has been solid waste management which in addition to disturbing the balance of the environment also has adverse effects on the health of the society. The detection, monitoring and management of wastes is one of the primary problems of the present era. The traditional way of manually monitoring the wastes in waste bins is a complex, cumbersome process and utilizes more human effort, time and cost which is not compatible with the present day technologies in any way. This an advanced method in which waste management is automated. This project IoT Garbage Monitoring system is a very innovative system which will help to keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. This web page also send all information to garbage collectionvehicles.

1. Introduction

Garbage Monitoring System: - Garbage may consist of the unwanted material left over from City, Public area, Society, College, home etc. This project is related to the "Smart City" and based on "Internet of Things" (IOT). So for smart lifestyle, cleanliness is needed, and cleanliness is begins with Garbage Bin. This project will help to eradicate or minimize the garbage disposal problem. The Internet of Things (IoT) is a recent communication paradigm that envisions near future, in which the objects of everyday life will be equipped with Arduino, transceivers for digital communication, and suitable protocol stacks that will make them able to communicate with one another and with the users, becoming an integral part of the Internet.

This paper IOT Garbage Monitoring system is a very innovative system which will help to keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a cloud server. For this the system uses ultrasonic sensors placed over the bins to detect the garbage level. The system makes use of Arduino family microcontroller, LCD screen, GPRS for sending data and a buzzer. The system is powered by a 12V transformer. The LCD screen is used to display the status of the level of garbage collected in the bins. Whereas a cloud server is built to show the status to the user monitoring it. The cloud server gives a graphical view of the garbage bins and highlights the garbage collected in color in order to show the level of garbage collected. The LCD screen shows the status of the garbage level. This system helps to keep the city clean by informing about the garbage levels of the bins by providing graphical image of the bins via a cloud server.

2.Literature Survey

Voice Control Arduino Robot

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Abstract*— *In this research paper, a system is being proposed, which focuses on the concept of how a robot can be controlled by the human voice. Voice control robot is just a practical example of controlling motions of a simple robot by giving daily used voice commands. In this system, an android app is used as a medium for the transmission of human commands to microcontroller. A controller can be interfaced with the Bluetooth module through the UART protocol. The speech is received by the android app and processed by the voice module. Voice is then converted to text. The microcontroller will further process this text, which will take suitable action to regulate the robot. The objective is to design a robotic car whose basic movements such as moving forward, turning to left or right can be controlled by the human voice. The Hardware Development board used here is the ATmega Arduino board. The software part is done in Arduino IDE using Embedded C. Hardware is implemented, and software porting is done. Generally, recognition of human voice using some kind of module cost way too much. After performing an ample amount of studies on controlling robots, we came to the conclusion that yes, there exists a simple and very efficient way to manipulate robots through our voice. This is an ergonomic approach for the ease of robotic application. Such types of robots will provide great helping hands while performing multiple tasks. The result of our studies also shows that there still exists plenty of space for further research and development.

Keywords*—*Voice Control Robot, Arduino IDE, Arduino UNO board, Bluetooth module HC - 05

I. Introduction

The surprising raise in the utilizing of robots and automation offers various advantages as well as it has drawn the attention of both academic investigation and commercial programs. The analysis on numerous technique of controlling robot has accomplished quite a few success by introducing a number of innovative & unique methods of robot movement control. Verbal interaction intended for robot controlling is actually sort of an innovative process among many methods which are introduced regarding robotics control. Previous works on voice controlled robots shows that the designs of those robots were complicated and none of them were able to interact with users. Robots are anticipated to socialize along with its user however it has not yet arrived at this kind of level. There are numbers of techniques to control robot using voice identification yet it is reasonably limited. Previously developed robot used ZigBee which is a costly device. Another Voice Controlled Robotic Vehicle utilized computer with a sound card and a microphone which was not user friendly. A technique to give voice command using android based smart phone using Bluetooth is presented to construct the robot based on microcontroller. The robot can accept instructions from users verbally and interact with user by speaking various sentences which will make it user friendly.

II. Overview Of The Proposed System

The robot will be based on microcontroller Arduino Uno because of its versatile features along with numerous advantages which is based on Atmega328P and an open source platform with the benefit of physical computing. The system will utilize Bluetooth technology and Standard communication interface known as SPI interface. Bluetooth uses radio waves with safe, less power consuming device to connect and exchange data between devices without using of any kind of physical contact like wires and cable. SPI interface is a synchronous serial information process utilized by microcontrollers for interacting along with one or more peripheral devices swiftly through limited ranges. There are two main applications that robot will be able to perform which are discussed below

A. Movement control of the robot using voice command

The movement of the proposed robot will be controlled by the voice command of the user. The user will use an android operated smart phone to give voice command.

The command can be fetched using an app which will convert the voice command into text.

The phone will be connected to the microcontroller using a Bluetooth module.

After conversion of the voice command into text the app will send necessary data to the microcontroller using Bluetooth of the phone and microcontroller will receive the data using Bluetooth module.

According to the command, the robot will move forward, backward, left, right or stop. For driving the robot there will be two geared DC motors with gripped tyre which will be operated by the help of DC motor driver.

B. Responding to the user input

When the robot receives the command from the user it will give an immediate response to the user.

If the user says that "go" command the robot moves in forward direction.

Similarly if the user says that back, right and left commands the robot moves in backward, right and left directions. Stop is the command used for stopping the robot at instant.

ENHANCE SENSITIVITY OF BANGLA HANDWRITTEN DIGIT RECOGNITION USING TEN LAYERED D-CNN MODEL

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ABSTRACT

This algorithm is hardly ever used in Knowledge of handwritten digits like bangle. This mission proposes a deep convolution neural network (D-CNN) primarily based Bangla hand written digits recognition. This D-CCN has seven layers. Mainly three convolution layers, three pooling layers and thoroughly related layer. Deep convolution neural network has these days received recognition due to the fact of its improved Performance over the typical computer learning algorithms. However, it has been very not often used on cognizance of bangle handwritten digit. The proposed method can decorate layers to ten or twelve layers via using deep CNN architecture for recognizing bangle handwritten digits with excessive sensitivity/specificity.

I. INTRODUCTION:

The principle challenge in manually written character characterization is to manage the large assortment of handwriting styles by various essayists in various languages. A portion of the intricate penmanship contents contain various styles for composing words. In some different cases, they are cursive and some of the time the characters are associated with one another (e.g., English, Bangladeshi and Arabic). These difficulties are as of now perceived by numerous specialists in the field of Natural Language Processing (NLP) Handwritten character recognition is more difficult comparing to printed forms of characters.This is because characters written by different people are not identical and varies in different aspects such as size and shape.The similarities in different character shapes, the overlaps, and the interconnections of the neighbouring characters further complicate the character recognition problem.Therefore, here in our project we are able to recognize hand written characters of different styles by using D-CNN method. We used Bangla language characters as example to work with our methods.

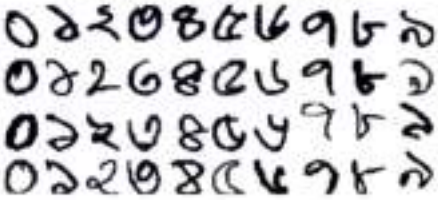

Fig1.1 : Bangla language digits used as references

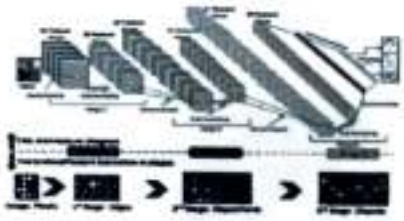

Fig1.2 Deep CNN Architecture

Fig 1.3 Convolution operation

Fusion of Multi Spectral Satellite Images to Improve Volcanic Hot Spots Detection

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Abstract–**Volcanic hotspots identification and monitoring can play crucial role in planning and extraction of disaster management. Satellite images have become able alive in this crucial domain to help in the identification of volcano hotspots. This research work aims to implement an automated volcanic hotspots detection approach using Adaptive Neuro Fuzzy Inference System (ANFIS)classifier. In order to improve classification accuracy and performance, a Dual Tree Complex Wavelet Transform (DTCWT) has been employed to fuse the volcano images in different spectrums visible, visible near infrared and Thermal infrared. The fused images subsequently used for extraction of features with help of Discrete Wavelet Transform (DWT) and Principle Component Analysis (PCA). ANFIS classifier takes these features as input and delivers classification in the way of indicating the possible absence and presence of volcano in that particular image. The approach is validated with help of ASTER volcanic data base, the classifier performance has been evaluated for computing different performance measures. The results demonstrate the improved accuracy that can be brought out by using fused images in the identification of volcano hotspots.**

Keywords: Volcano, Satellite images, ANFIS, DTCWT, DWT, PCA and ASTER

I. INTRODUCTION

Application of technology for mitigating suffering due to natural disasters has always been fore front of researchers. Use of soft computing techniques in disaster prediction and management has interested measures at different levels. Soft computing techniques have given the humans the power and capability to identify events preluded the occurrence of major disasters. Even though it's quit impossible to forecast all natural calamities, it is imperative to identify methods that can fore warn the possible occurrence of an event.

Existing algorithms on identifying volcano hotspots are based on ground based measurements which include seismology, ground deformation, hydrology, forest growth and robots. All ground-based measurement algorithms suggest volcano deformation can be used to assess eruptive hazards, but installation and maintenance of instrument network is very complex and costly. Now-a-days, satellite imaging is one of the most important sources of geographical, geophysical and environmental information which provide data with multi temporal, multi spectral, comprehensive coverage of large areas and global coverage in real time. Satellite based observation can also be done at frequent intervals for monitoring the natural disasters with geospatial resolution of a few centimeters. The draw backs in the ground based measurement in the case of volcano hotspots detection can be overcome with help of satellite image processing.

Soft computing techniques have extensively used by researchers to provide these fore warning capabilities. This research work is such attempt to extensively investigate and exploit the power of soft computing techniques to identify the location of volcano hot spots. In this proposed research work different soft computing techniques have been studied for their suitability in identifying volcano hot spots in satellite images. Multi spectral satellite data have been employed for image processing and analysis. Suitable modification and improvements has been suggested for existing techniques like KNN, SVM, ANN to increase the prediction performance and accuracy. As a part of this research work an ANFIS based system classifier has also been developed and tested for its performance.

Pre-processing techniques such as contrast stretching enhancement & adaptive histogram equalization are used to enhance the features in satellite image and segmentation techniques such as region growing & modified region growing techniques are employed to separate the hotspot region. In order to further enhance the accuracy DWT & PCA based feature extraction and fusion based approach which fuses the visible and visible near infrared have also been implemented. This fusion has been carried out with help of DTCWT and delivered highly accurate classification even during the presence of high degree of cloud covers. A systematic result analysis of different soft computing techniques are experimented also has been clearly presented and discussed in this proposed research work.

Statistical features such as mean, mean square, variance, skew & kurtosis, textures features such as contrast, homogeneity, entropy, energy, correlation & inverse difference moment, spectral features such as wavelet coefficients and shape parameters such as area, perimeter

Algorithm for Digital Image Watermarking Using Learnable Features of ConvNet

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Abstract **–With increasing development of information technology, electronic publishing is becoming more popular, so need for copyright protection has been increased. Digital watermarking is used to protect digital data from being altered. we embed the information using features of ConvNet (Convolution Neural Network).**

This binary image is used as watermark. Cover image is converted into RGB components and binary watermark is inserted into mid frequency bands of cover image to protect information from attackers. Watermark is implanted in the blue component of RGB image. The PSNR and NCC values obtained in this research show that the method is imperceptible and robust against signal distortions such as contrast enhancement, gamma correction, image sharpening, Gaussian filter, etc.

Keywords— LWT; quad tree decomposition; Fractal image; NC; watermark image

I. INTRODUCTION

Embedding Data or information within a digital media is known as digital watermarking. Digital image watermarking is divided based on embedding position as spatial and frequency domain watermarking. Spatial domain techniques modify image pixels of images and frequency domain techniques involve modifying transform coefficients instead of changing image pixels directly.

Cheng-Hao Li et al. [1] demonstrates watermarking scheme which uses image similarities and isometric transform. Watermark used here is digital binary watermark. This is robust against JPEG compression attacks.

Soheila Kiani et al. [2] presented a watermarking technique which uses fractal block coding with mean of range blocks and local search region taking contrast scaling as its parameters. They inserted binary watermark in image which provides authentication and verification at the same time.

Cao-Xiaoli et al. [3] introduced algorithm in which cat transformative operation and logistic scaling are compositely used with scrambling watermark. Carrier image is wavelet transformed and encrypted data is inserted in low frequency sub bands of carrier image. This algorithm shows anti-cryptanalysis, robustness and transparency.

Arun et al. [4] demonstrated algorithm for digital image watermarking based on DCT. Fractal images are binarized and these binary images are used as watermark and embedded into gray scale equivalents of RGB cover images.

Arun et al. [5] proposed an enhanced digital imaging technique which uses fractal images. Gray scale images are obtained from RGB components of cover image. Binary watermark is generated from fractal image (daisy spiral). Binary watermark is implanted into gray images of original cover image instead of original watermark image itself. DWT is used for inserting watermark into the R,G,B channels of cover image. Watermark is inserted separately which increases the security and robustness of the scheme.

K Ghaderi et al. [6] demonstrated a semi blind watermarking technique using LWT and SVD. Host image is transformed using 2D-LWT. Fractal code is used to get the watermark and implanted into the host. In the watermark retrieval process, watermark image is recovered by extracting fractal code. This proposed technique is powerful for attacks like JPEG compression, Cropping, rotation, average filter etc.

S. Liu et al. [7] demonstrated double encryption method improving classical method using DCT. In the first encryption, fractal encoding is used and in the second encoding, DCT is used with encoded parameters. Experimental results obtained have high PSNR and robustness than traditional methods. Several attacking methods such as white noise attack, JPEG compression attack are performed on input image.

This paper presents an algorithm based on LWT for digital watermarking of RGB images taking fractal image as watermark. Original color image is separated into RGB channels. Binary fractal image is obtained from Quadtree decomposition of watermark image. So, instead of taking watermark as it is, substitute binary fractal image is used. Watermark is embedded into Blue channel. ILWT is applied to get the watermark embedded image. R channel, Green channel and watermarked Blue channel are concatenated to get the Final embedded image.

Introduction about fractal images and Quadtree decomposition is described in section II. Details about LWT are demonstrated in section III. Proposed system is elaborated in section IV. Results are shown in section V and algorithm is concluded in Section VI.

Implementation of Sense Amplifier using Flip-Flops for Memory Applications

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ABSTRACT- **A novel high-speed and highly reliable sense amplifier- based flip-flop with transition completion detection (SAFF-TCD) is proposed for low supply voltage (*VDD*) operation. The SAFF-TCD adopts the internally generated detection signal to indicate the completion of sense-amplifier stage transition. The detection signal gates the pull-down path of the sense-amplifier stage and the slave latch, thus overcoming the operational yield degradation, current contention, and glitches of previous SAFFs.The operational yield, speed, hold time, energy consumption, and area of the proposed and previous FFs are quantitatively compared for a wide range of *VDD* with 22-nm FinFET technology. It is shown that the minimum *VDD* of the SAFF-TCD is 573 mV lower than that of previous SAFFs, which means the SAFF-TCD can operate even when *VDD* is in the near threshold or sub threshold region. At 0.3–0.4 V, the SAFF-TCD operates twice as fast as the master–slave-based FF (MSFF) with a practical hold time.**

Keywords: - Flip-flop (FF), low-voltage circuit design, sense amplifier (SA).

I.INTRODUCTION

Demand for an ultralow-power system on chip (SoC) continues to increase because of the growing interest in highly energy-constrained mobile SoC applications. In particular, for applications where performance is of secondary importance, one of the simplest and most efficient methods to improve energy consumption is to reduce the supply voltage (*VDD*) at the expense of speed loss. As part of this trend, digital circuit design techniques for sub threshold or near-threshold voltage operation have received increased attention [1].The flip-flop (FF) is a key element as most modern microprocessors operate under the synchronous pipeline structure. In low *VDD* regions, to minimize speed degradation, it is preferable to use a fine-grained pipeline with fewer combinational logics between FFs [2]. This means that the relative portion of the power dissipation and clock cycle time of FFs is significant. Thus, the design of low-power FFs with small input (D) to output (Q) delay, *t*DQ, is essential. In addition, the effect of process variation on the driving strength of a transistor dramatically increases as *VDD* decreases, leading to a large variation in gate delay.

As a result, the setup time, *t*setup, in master–slave-based edge triggered FFs [3]–[6], which is determined by the worst case variation, is significantly increased [7]. In the pulse-triggered FFs proposed in [8]–[11], this problem is resolved. Input D of the pulse-triggered FFs starts to be sampled by the latch right after the clock rising edge, which results in nearzero or negative *t*setup. However, these FFs suffer from conflicting requirements for the width of the sampling window. A very small width cannot guarantee that the input data value properly propagates into the latch, whereas a large width increases the hold time, *t*hold. This so-called sizing problem becomes more severe as variation effects increase in low *VDD* regions, because the pulse width required to reliably propagate the input into the latch and *t*hold are determined by the respective worst variation corners. There are also approaches to achieve low *VDD* operation of FFs by utilizing 28-nm fully depleted silicon on insulator (FD-SOI) with back biasing [12], [13]. With the back biasing, circuit designers are allowed to control *Vth* dynamically, which enables to widen the operating voltage range. Especially in [13], it is demonstrated that nonvolatile FF based on magnetic tunnel junction can be operated with near-*Vth* FD-SOI circuits with the use of multiple *VDD* values.The sense-amplifier-based FF (SAFF) [14], which iscomposed of a differential SA stage followed by a slave element of NAND-

PIC Controlled War Field Spy Robot with Bomb Detection and Night Vision Wireless Camera by for Android Application

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Abstract: This paper is based on PIC Controlled war field Robot with bomb detection and night vision wireless camera. The main motive of this paper is to explain how the spy robot can be used in many applications and how the spy robot is built with various devices. Firstly, this project is made to develop a Warfield spy robot with the PIR sensor and metal detector sensor for sensing purpose and night vision camera is used to monitor. The PIC Controlled war field Robot along with wireless night vision camera is used to transmit the real time video and photographs. A PIC microcontroller used for the required operation, the android applications are used to receive the instructions from the receiver to the transmitter of the robot to move left or right and forward, backward. The communication between android application and the spy robot is carried through the Bluetooth HC-05 module.

Keywords: Spy robot, PIC microcontroller, PIR sensor, metal detector sensor, Bluetooth HC-05 module, Wireless night vision camera.

I. INTRODUCTION

There will be constant invasions in the borders. So, the surveillance of the enemy's activities becomes difficult. If we use spy robots for the surveillance, there will be reduce in the risk of human life. The spy robot will serve as an appropriate machine for the defense sector to reduce the loss of human life and will also prevent illegal activities. This innovative system is made for operations which involve high risk for humans to enter, especially for some criminal cases and may prove very beneficial for military area for spying purposes.

II. LITERATURE SURVEY

The literature survey includes architecture of the Bluetooth HC-05 module and Motor Driver.

The Bluetooth Hc-0 module is used to control the robot through the android application. The android application is developed by MIT App inventor.

A. BLUETOOTH HC-05 Module:

The Bluetooth HC-05 module contains of 6 pins. The six pins are Key, 5V, GND, Tx,Rx,Status. The Bluetooth module own two devices i) master device ii) slave device. We can connect one device to the master device and we can connect one device to the slave device. The connection between the two Bluetooth devices can occur as follows:

- The Transmitter(Tx) pin in the Bluetooth is connected to the Receiver(Rx) pin of the Arduino board and Transmitter(Tx) pin of the Arduino is connected to the Receiver(Rx) pin of Bluetooth. The power supply pin of Bluetooth are given to the GND and power supply of Arduino board respectively. Thus, this cross-connection are mandatory for the Bluetooth operation.
- To communicate, we connect the master device with the slave device. To pair the two devices there is need to enter password.
- The password is either 0000 or 1234. The password is entered, both the devices are connected.

B. Motor Driver IC:

- The L293 and L293D are quadruple high-current half-H drivers.
- The L293 IS designed to provide bidirectional drive currents of up to 1A at voltage from 4.5V to 36V.

Fig :L293D Motor Driver IC

- The L293D was designed to provide bidirectional drive currents up to 600-mA at voltages from 4.5V to 36V. The L293D IC was sixteen pins. There are four ground pins four input pins and. The motors of two pins connected between the output pins of four .

Hybrid Optimization Techniques for Analyzing the Performance of Transmission System Using Novel SVC Model

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***Abstract*— The foremost concern for contemporary power system networks in service are loss minimization, cost minimization and voltage stability under highly strained conditions due to continuously augmented power demand. Hence, it is essential to examine the power system taking into account these factors. Device such as Static VAR Compensator (SVC) which is a very much flexible AC Transmission System (FACTS) in a power system improves the voltage stability, reduce the power loss and also improves the load ability of the system. The addition of SVC FACTS devices in the overall system has different approaches. This proposed paper will present new approach on modeling of the device by varying the firing angle of the control power electronic device of the FACTS device. This is achieved by using Hybrid Optimization which is participated to confirm the best location of the SVC device and optimal firing angle of the SVC. Methods of Hybrid GA-PSO and DA-PSO are proposed in this paper, to find out the most favorable location and firing angle of SVC in the power system. The location of the device is optimized by GA or DA and the optimized firing angle is done by means of PSO. As the two different Optimizing techniques are made use of to resolve single objective function, it is known as Hybridization. The anticipated optimization is an efficient method to find the optimal location of SVC device and also rising voltage profile and falling the power system losses in the line. This Hybrid GA-PSO and DA-PSO is tested on IEEE 30 and IEEE 118 bus test systems and simulation results are presented.**

Keywords—Power system, Conduction system, FACTS, SVC, Firing Angle, Hybrid GA-PSO and DA-PSO.

I. INTRODUCTION

Because of ever increase in the demand for electric power it is highly insecure and tough to run power network. It is more helpful to operate the power system network which may give direct and flexible control of power transfer. The performance of power system and its stability can be increased with the help of FACTs device. [1] To increase the stability of power and power transfer capability of transmission network with the installation of SVC accurately with the system with suitable setting of the parameter. The factors responsible for optimal installation and the SVC optimal parameter which are meant for the betterment of stability margin, power loss minimization, voltage profile enhancement, power blackout prevention and power transmission capacity advancement. During the last two decades number of algorithms like Newton Raphson method, genetic Algorithms, Particle Swarm Optimization Algorithms have been developed power flow optimization accomdately with SVC device and for optimal placement of the FACTs devices. [4] It is important and actual subject to select the most suitable location of FACTS device installation at the view point of the enhance of voltage stability and minimization of power loss. The interest in this problem has been retained by the world wide researchers in the power system. The various methods and criteria were pronounced and applied for optimal allocation of FACTs devices in power network.

In this paper, the optimal location for placement of FACTS device has been formulated as a problem, and is solved using a new Hybrid Optimization algorithm called the Hybrid GA – PSO and DA - PSO Algorithm. The Hybrid Optimization Algorithm is used for finding out the optimal location of advanced static VAR compensator (SVC) devices, to achieve minimum transmission line losses and more improved voltages in the system.

Many concepts were proposed by many authors regarding placement and sizing of SVC. The equations in polar form related to real and reactive power flow are represented by Hadi Saadat for two bus systems using Newton Raphson method with the help of a Jacobean matrix [1]. The initiation and development of FACTS devices from power electronics devices is referred by Hingorani N.G et.al. The improved stability, increased security, with the more heightened capability for power transferring and mitigated operation and transmission investment costs can be attained by using SVC's [2]. The combination of mechanically controlled and thyristor controlled shunt capacitors and reactors are named as SVC [3]-[4]. With reference to [5]-[6] papers, the combination of either thyristor controlled reactor & fixed capacitor or thyristor controlled reactor & thyristor switched capacitor is considered as the most popular model of SVC's. The novel firing angle model for Static VAR Compensator (SVC) FACTS devices is also designed as new SVC model [7]-[9]. As on development in the power electronic construction, the variable reactance reactive power compensator is placed instead of fixed capacitor and reactor reactive compensator. In multi machine power systems, Kumar G.R et.al discussed in brief regarding FACTS controllers with respect to of load flow analysis from various

Application of Multi-Level Converter for Fast Current Control in Small-Scale DC Power Network

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***Abstract*— DC microgrids have been emerging as next-generation small-scale electric power networks, where the line impedance is very low. This phenomenon causes large currents in the microgrids, even for a slight change in voltage; therefore, it is critical for a power flow controller to have faster transient response and precise power flow control. In this study, multi-level converters are applied as the power flow controllers to realize high-speed and high-precision power flow control in a DC microgrid. The output filter can be small, as a multi-level converter is used. This paper also presents the design of the output LC filter of a multi-level converter to satisfy a requirement of current ripple. We experimentally verified that a multi-level converter with a smaller filter can realize high-speed and high-precision power flow control for low line impedance conditions compared with the conventional 2-level converters.**

***Index Terms*— Microgrids, DC-DC power converters, Power flow control**

I. Introduction

VARIOUS studies, including the verification tests of DC microgrids, have been reported to enhance the reliability of the entire system [1-5]. A DC microgrid helps achieve efficient power transfer by reducing the number of power conversion stages between the AC and DC sides, because most grid-tied renewable energy systems deal with DC power on both input and output sides. Line impedances are usually very low in a DC microgrid owing to the shorter distances between the nodes such as the generators, batteries, and loads compared with a large-scale AC grid; thus, a large current flows through the lines even for a slight change in voltage. To suppress the excess current, a 2-level converter needs a bulky output filter. To overcome these limitations in a microgrid, a converter with high speed and precise power flow control is required. However, with a large LC filter, power flow cannot change rapidly, even for a sudden change in the reference of the power flow and load conditions.

In recent years, experimental investigations assuming the DC micro grid network have been extensively conducted [6-10]. Examples of the grid network configuration connecting only two converters have been discussed in [6-8]. Reference [6] proposes an output impedance matrix model to describe the terminal frequency characteristics of a DC-DC converter around its switching frequency. In reference [7], a new configuration comprising the photovoltaic panels, a series DC electric spring, and a noncritical load is proposed to reduce the battery storage capacity of a DC microgrid that have substantial photovoltaic installations. Reference [8] proposes a control scheme of a bidirectional DC-DC converter for the energy storage systems to resolve the issue associated with change in its operation modes. A part of a grid configuration connecting only two converters and a passive resistive load has been investigated in [9]. Reference [9] proposes an efficient power flow sharing and voltage regulation control method based on a hierarchical control to minimize the transmission loss of the DC micro-grids. An example of a network configuration by connecting three or more nodes has been presented in [10]. Reference [10] presents the establishment and operation control of the DC microgrid incorporating with an electric vehicle (EV) as a movable energy storage. The circuit topology used for the above studies in [6-10] has been mainly the 2-level converter. Moreover, an improvement of the dynamic performance has not become their main objectives.

Meanwhile, there are studies aiming the realization of the high-speed response of the individual converter [11-12]. In [11], a control method to realize the fast current response in a DC-DC converter was reported. This method assumes a low-voltage power supply with conversion from 5.5 V to 3.3 V and a switching frequency in MHz range to be integrated on a chip or in a package. Reference [12] proposed a predictive current control for a bidirectional 2-level DC-DC converter to enhance the steady-state and dynamic performances of the DC microgrid.

In addition, there are studies dealing with the circuit topology of a 2-level bidirectional converter for the DC microgrid [13-14]. For the power converters on the DC microgrid, the conventional 2-level topology has usually been adopted; however, the 2-level topology has inherent limitations in achieving a higher switching frequency and a faster dynamic response.

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Three-Level Power Balancing for Electric Vehicles

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***Abstract*— This paper deals with an open end induction motor, fed from dual two-level voltage source inverter (VSI), for battery electric vehicle (EV) drive is considered. A dual two-level inverter supplied from isolated battery packs is an attractive multilevel topology for electric transportation. Using pulse width modulation (PWM) techniques, it is possible to provide power balancing between the two isolated battery packs, thereby increasing the reliability of the multilevel dual two-level inverter topology. This paper introduces a modified carrier based modulation technique, for balancing the state of charge (SOC) of independent battery packs and to dynamically regulate the power flow from the two inverters, according to the drive requirement. The operation of the proposed scheme has been validated through simulation.**

***Keywords*—Battery pack, dual two-level inverter, multilevel inverter, open end machine, power sharing, pulse width modulation (PWM) techniques, state of charge (SOC).**

I. Introduction

Multilevel inverters are very popular for high power and high voltage traction drives. They have reduced harmonic distortion, lower common mode voltage, reduced stress, and lower dv/dt across the power devices, when compared to the existing two-level inverter drive. In the last two decades, many multilevel inverter structures have been proposed in the literature, amongst them the classic topologies are diode clamped, flying capacitor and cascaded H-bridge. A topology derived from cascaded H-bridge is the dual two-level inverter, which is capable of supplying a three-phase AC load, with an open end configuration on the stator/primary winding. The inverter configuration works on the principle of superposition, to produce a three-level voltage output. Due to the use of readily available two-level inverters, the hardware complexity for dual two-level inverter is minimized, when compared to other three-level inverter topologies. This makes the dual two-level inverter to be widely explored for EV propulsion systems.

The dual two-level inverter can be supplied from a single battery pack. However, this will cause circulation of common mode current in the power circuitry. The use of common mode reactors or specific modulation techniques can suppress the effect of common mode current in power converters. Alternatively, the common mode current can be intrinsically eliminated, if the dual two-level inverter is fed from two electrically isolated dc power supplies. The structure of dual two-level inverter makes it more fault tolerant than the other multilevel inverter topologies, hence ensuring a reliable operation for an EV power train. During fault in any leg of either three-phase inverter, a control algorithm can be incorporated to short-circuit the output terminal and operating the drive with healthy inverter as conventional three- phase traction drive at half the rated power and rated speed .

Due to manufacturing tolerances and aging over time the two battery packs in a dual two-level inverter can have different capacities. As a result, one battery pack of the dual two-level inverter fed drive may discharge at a faster rate than the other. For vehicular applications, it is essential that the two battery packs are discharged uniformly. This can be achieved by drawing different powers from the two packs based on their current SOCs. A proper SOC balancing in the isolated battery packs can be ensured by a suitable PWM technique. There are various modulation techniques that have been proposed by different authors for dual two-level inverter and its multilevel operation. A space vector based PWM techniques for dual two-level inverter, similar to conventional three-phase inverter is described in which each inverter is switched alternatively in a sub cycle of a switching period. For the optimal inverter utilization a concept of collinear vectors with independent control of the two inverters has been proposed using space vector modulation (SVM), an effective power sharing facility within the switching cycle can be attained. However, the implementation of SVM requires sector identification and complex calculations.

This paper presents a simple carrier based approach for achieving multilevel operation and dynamic power sharing be-

Performance Analysis of BLDC Motor drive using Fuzzy and ANFIS controllers

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Abstract:

This paper presents design and simulation of Electronically Commutated DC motor or Brushless DC(BLDC) Servomotor drive using Fuzzy and ANFIS controllers. The performance of BLDC motor drive is verified under different operating conditions such as change in reference speed, parameter variations, load disturbance, etc. However for above operating conditions of BLDC motor using conventional controllers does not give acceptable transient and steady state response. The BLDC motor drive using Fuzzy and ANFIS controllers gives good operating, transient, and steady state response. But Fuzzy logic control method gives more harmonics in the output voltage and current waveforms by this means increasing in i.e Total Harmonic Distortion (THD). So here in this paper BLDC motor drive using ANFIS controller gives fewer harmonic content in the output current and voltage wave forms, distortion less output and reduced Total Harmonic Distortion (THD).

Key words: Electronically Commutated DC motor or BLDC motor, Total Harmonic Distortion (THD), Fuzzy logic controller, ANFIS controller.

I. INTRODUCTION:

In general brushless dc motor is also knownIn various industrial and home applications Brushless DC motors are used in extent manner. Due to advantages of Brushless DC motors there is better control schemes to predict the presentation of the motor. d-q model and abc phase variables models erstwhile used in Brushless DC motor drive systems under different loading condition. So Many BLDC simulation models were anticipated [1]-[6] using non-linear state-space equations. Here BLDC Motor used as star linked through neutral grounding but so numerous applications requisite isolating the neutral [8]. Comphrensive simulation studies carry out by using entire control system modeling. This paper deals with motor performance under different loading situation using Fuzzy and ANFIS controllers.

Modeling of BLDC Motor

abc phase changeable and d-q axis models are used mathematically in BLDC motor. In a BLDC motor the back emf is trapezoidal in nature implies that non sinusoidal mutual inductance among stator and rotor windings, and then renewed in to d-q axis representation. This method is not having a exacting advantage, so we go for adc phase variable technique. Here we assumed that BLDC motor is star linked through isolated neutral. In BLDC motor modeling the subsequent assumptions are made i.e.

i. BLDC Motor is not drenched.

ii. Self and Mutual inductances are invariable and stator resistance of all windings is like.

iii. Semiconductor devices are ideal in nature.

The balanced circuit of the BLDC servomotor drive system is shown. The line to line voltage equations in matrix form is given as

$$\begin{bmatrix} V_{ab} \\ V_{bc} \\ V_{ca} \end{bmatrix} = \begin{bmatrix} R & -R & 0 \\ 0 & R & -R \\ -R & 0 & -R \end{bmatrix} \begin{bmatrix} i_a \\ i_b \\ i_c \end{bmatrix} + \begin{bmatrix} L-M & M-L & 0 \\ 0 & L-M & M-L \\ M-L & 0 & L-M \end{bmatrix} \times \frac{di}{dt} \begin{bmatrix} i_a \\ i_b \\ i_c \end{bmatrix} + \begin{bmatrix} e_a - e_b \\ e_b - e_c \\ e_c - e_a \end{bmatrix} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Mutual inductance (M) is neglected as compared to the self-inductance (L); as a result matrix equation can be rewritten as

$$\begin{bmatrix} V_{ab} \\ V_{bc} \\ V_{ca} \end{bmatrix} \begin{bmatrix} R & -R & 0 \\ 0 & R & -R \\ -R & 0 & -R \end{bmatrix} \begin{bmatrix} i_a \\ i_b \\ i_c \end{bmatrix} + \begin{bmatrix} L & -L & 0 \\ 0 & L & -L \\ -L & 0 & L \end{bmatrix} \times \frac{di}{dt} \begin{bmatrix} i_a \\ i_b \\ i_c \end{bmatrix} + \begin{bmatrix} e_a - e_b \\ e_b - e_c \\ e_c - e_a \end{bmatrix} . (2)$$

Where

L=Self-inductance.

M= per phase Mutual inductance ;

R=per phase stator winding Resistance;

e_a, e_b and e_c=Back EMFs of phases a, b, and c, separately;

i_a, i_b, i_c= phase streams of phases a, b, and c, individually.

In BLDC motor, the electromagnetic torque generated by means of the motor can be expressed as

$$T_e=(e_a i_a + e_b i_b + e_c i_c) / \omega = K_t I \quad (3)$$

where $i_a = i_b = i_c =$ I, ω is the angular velocity in radians per second, and K_t is the torque invariable. Since this electromagnetic torque is

Multi Quadrant Operation of BLDC Motor Drive

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Abstract: This paper presents the simulation of the control of three phases Brushless DC (BLDC) motor in all the four quadrants. This paper presents a concept wherein the kinetic energy is converted and stored in a battery. The battery thus charged can be used to run the same BLDC motor with no interruption in power supply. The digital controller dsPIC30F4011, which is very advantageous over other controllers, is used to achieve precise control.

Keywords : BLDCmotor,four quadrant operation,

1. INTRODUCTION

Brushless direct current motors (BLDC) are one of the advance motors used which are rapidly increasing their popularity and applications. BLDC motor has rotor with permanent magnets and stator with stacked steel laminations with windings inserted in slots. The motor has less inertia, therefore easier to start and stop. BLDC motors are potentially cleaner, faster, more efficient, less noisy and more reliable.

Therefore, BLDC motors often incorporate either internal or external position sensors to sense the actual rotor position or its position can also be detected without sensors. BLDC motors are used in Automotive, Aerospace, Consumer, Medical, Industrial Automation Equipment and Instrumentation.

2. FOUR QUADRANT OPERATION OF BLDC MOTOR

A. BLDC MOTOR"

Brushless DC Motors are driven by DC voltage but current commutation is controlled by solid state switches. The commutation instants are determined by the rotor position. The rotor shaft position is sensed by a Hall Effect sensor, which provides signals to the respective switches [1]. Whenever the rotor magnetic poles pass near the Hall sensors, they give a high or low signal, indicating either N or S pole is passing near the sensors.

Based on the combination of these three Hall sensor signals, the exact sequence of commutation can be determined. These signals are decoded by combinational logic to provide the firing signals for 120° conduction on each of the three phases.[1]

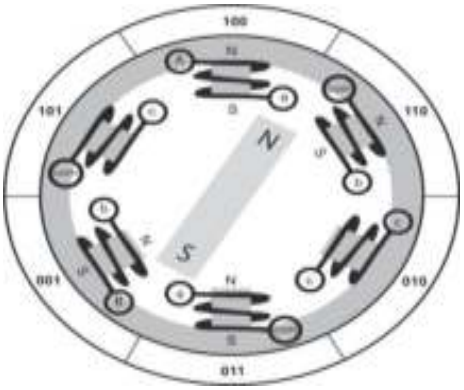
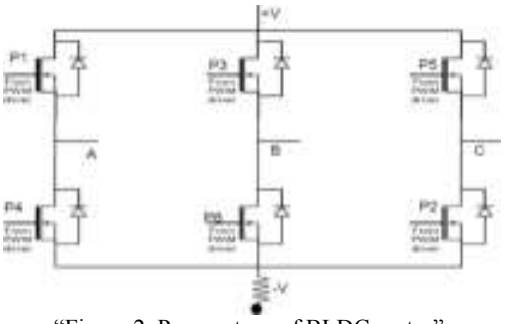


Figure 1. BLDC Motor

The numbers shown around the peripheral of the motor diagram in Fig. 1 represent the sensor position code. The north pole of the rotor points to the code that is output at that rotor position. The numbers are the sensor logic levels where the Most Significant bit is sensor C and the Least Significant bit is sensor A. Based on the combination of these three Hall sensor signals, the exact sequence of commutation can be determined.

These signals are decoded by combinational logic to provide the firing signals for 120° conduction on each of the three phases. The rotor position decoder has six outputs which control the upper and lower phase leg MOSFETs of Fig. 2 [2]–[3].



"Figure 2. Power stage of BLDC motor"

A NOVEL QUADCOPTER UAV BASED FERTILIZER AND PESTICIDE SPRAYING SYSTEM

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Abstract— **This project proposes the Indian agriculture needed production and protection materials to achieve high productivity. Agriculture fertilizer and chemical frequently needed to kill insects and growth of crops. The WHO (World Health Organization) estimates there are more than 1 million pesticide cases in every year. In that more than one lakh deaths in each year, especially in developing countries due to the pesticides sprayed by human being. The pesticide affects the nervous system of humans and also leads to disorders in body. A remote controlled UAV (Unmanned Aerial Vehicle) is used to spray the Pesticide as well as fertilizer to avoid the humans from pesticide poison. The UAV is operated by manual flight plans and the Sprayer is manually triggered by RF controlled Nozzle. The vertical take-off and landing quadcopter is used to spray the low volume pesticide in a small area. This project describes the development of quadcopter UAV and the sprayer module. And also discusses the integration of sprayer module to quadcopter system. This model is used to spray the pesticide content to the areas that can't easily accessible by humans. The Universal Sprayer system is used to spray the liquid as well as solid contents which are done by the universal nozzle. Multispectral camera is used to capture the remote sensing images which are used to identify the green fields as well as the edges of crop area. Total payload liftoff weight of quadcopter is 8 kg. Remote sensing images are analyzed by QGIS software.**

Keywords: Unmanned Aerial Vehicle (UAV), Radio frequency (RF), Sprayer module, Remote sensing, GPS, Micro strip patch antenna, Normalized Differential Vegetation Index, Multispectral Camera.

1.INTRODUCTION

The quadcopter is cost effective alternate to high cost standard rotorcrafts. UAVs are rapidly upcoming method for cultivation, production and protection processes. The quadcopter was chosen for this project because of high stability and more lifting power. The control of quadcopter is easier than the helicopter model of vehicles. Some applications of quadcopter are Search and Rescue, Police, Code Enforcement/Inspections, Emergency Management, Fire, Surveillance, Border Security, Defense, etc. The WHO (World Health Organization) estimates there are more than 1 million pesticide cases in every year. In that more than one lakh deaths in each year, especially in developing

countries due to the pesticides sprayed by human being and handling of pesticides. The health effects of pesticides include asthma, allergies and hypersensitivity, and pesticide exposure to cancer, hormone disruption and problems with reproduction and fetal development. Other pesticides may be irritated the skin and eyes. More pesticides are very dangerous carcinogens.

Other pesticides may be affects the hormone and endocrine system of the body. Even though very low levels of exposure during spraying may have leads to health effects. Pesticide exposure can cause a wide range of neurological health effects in body such as memory loss, loss of coordination, reduced speed of response to stimuli, reduced visual ability, altered or uncontrollable mood and general behavior, and reduced motor skills.

2. SOLUTION

UAV inbuilt pesticide sprayer is basically Sprayer integrated into a quad copter to spray pesticides and fertilizers in open crop fields. The main objective of this project is to reduce the illeffects to humans. The quadcopter is used to spray the contents under any climatic conditions. The UAV inbuilt sprayer contains a universal sprayer which is used to spray the both Fertilizer and Pesticide on a same sprayer. The Universal nozzle is used to regulate the Liquid content as well as solid contents. The pressure pump is used on a Pesticide spraying and not on Fertilizer Spraying. Multispectral camera is used to capture the remote sensing images which are used to identify the green fields as well as the edges of crop area. GPS navigation is used here for auto guidance system for UAV.

3. REMOTE SENSE IMAGING

The remote sensing in agriculture is easy on now a day, because of new introduced technologies. Quadcopter and other drones are the best choice of mapping the remote sensing data. These are the low cost drones used in precision agricultural usages. Piloted aircrafts are more expensive method to map the remote sensing. Satellite data also costly method in agricultural remote sensing and also the real time remote sensing data is not possible with satellite. So, the Unmanned Aerial Vehicles are the best choice to map the remote sensing images. The information collected from these UAVs is good resolutions measured with inches per pixel. This remote sensing data is used to map the growth of crops, moisture level and more. 3.1. Multispectral camera Multispectral camera used to capture the remote sensing images. This multispectral camera is attached with small unmanned aerial vehicles and manned aircrafts also. RedEdge multispectral camera provides an accurate multi-band data for agricultural remote sensing applications. This

Study on Impacts of Poor Drainage Related Performance of Flexible Highway Pavements

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Abstract: Moisture in the pavement system can lead to moisture damage, modulus reduction, and strength loss. Complete saturation of pavement systems can happen only when positive total heads are present and apportioned in such a way that saturation of the pavement system is reached. These pernicious effects can be decreased by preventing water from entering the pavement system. Pavement service life can be 1.5 times more, if infiltrated water can be drained off without delay. Pavement systems having good drainage can be expected to have a design life of 2 to 3 times that of undrained pavement systems. This paper gives a study of drainage related performance of flexible pavements.

Keywords: surface drainage, pavement performance, flexible pavement, pavement distresses, drainage quality.

1. INTRODUCTION

It is a well-known fact that water in pavement systems is one of the principal causes of premature pavement failure. Indian road network at over 3.3 million km falls under one of the world's longest road networks. Most of the highways built in our country have very slow draining systems, largely because standard design practices emphasizes on density and stability but place little importance on subsurface drainage. The poor sub-surface drainage on these roads leads to large amount of costly repairs or replacements long before reaching their design life. Subsurface drainage is a key element in the design of pavement systems. Indiscriminate exclusion of this element will assuredly lead to the premature failure of pavement systems, thereby resulting in high lifecycle costs. Excessive water content in the pavement base, sub-base, and sub-grade soils can cause early distress and lead to a structural or functional failure of pavement, if counter measures are not undertaken. Water-related damage can cause one or more of the following forms of deteriorations:

a) Reduction of sub-grade and base/sub-base strength,
b) Differential swelling in expansive sub-grade soils,
c) Stripping of asphalt in flexible pavements,
d) Frost heave and reduction of strength during frost melt, and
e) Movement of fine particles into base or sub-base course materials resulting in a reduction of the hydraulic conductivity considerably.

Proper surface drainage can reduce the amount of water infiltrating through the pavement and is a strategy that goes hand in hand with proper subsurface drainage. Most free water will enter the pavement through joints, cracks, and pores in the surface of the pavement. Water also will enter from backup in ditches and groundwater sources. Drainage prevents the buildup of free water in the pavement section, thereby reducing the damaging effects of load and environment. Based on documented case histories, studies have shown that pavement life can be extended up to three times if adequate subsurface drainage systems are installed and maintained.

Highway Drainage System

Highway drainage may be classified into the following categories:

1. Surface drainage
2. Sub-surface drainage
3. Cross Drainage Works
5. Disposal of acceptable quality of water

1. Surface drainage:

Removal and diversion of surface water from the roadway and adjoining land is termed as surface drainage. The surface water is to be collected and

REVIEW ON INTRINSIC SELF-SENSING BEHAVIOR OF CONCRETE FOR HEALTH MONITORING OF STRUCTURES INTEGRATED WITH SELF DIAGNOSING MATERIAL

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Abstract,

In present days, even though the concrete structures have designed for good quality, It is affected by crack, failure because of various influencing parameters. To avoid those kinds of failures in the real structure, the proper strengthening materials and health monitoring concepts should be used in smart way. The implementation of proper health monitoring concepts will be used to identify the origination of defects, failures, pore structure changes at different stages of loading during the usage at the earliest, These identifications will be used to implement the proper Rehabilitation methods at the initial stage to avoid the development of cracks, failure, sudden collapse, etc..

The implementation of Structural Health monitoring system plays a major role in the massive constructions like Bridge, Dams, and Highways and Especially in Underground structures like Tunnels, Sewer pipes etc...The continuous monitoring of the performance will be used to avoid the sudden failure of the underground structure; the identifying of stress strain behavior of the concrete can be identified in a Nondestructive manner. In this review the different literatures are reviewed and two electrical methods is prescribed for health monitoring in Non Destructive manner.

1. Introduction

At present implementation of monitoring systems requires the sensors, Adding the additional sensors will not be cost effective and the embedded sensors will be having the particular period of life span .the replacement of sensors will increase the maintenance cost. In spite of using the sensors for health monitoring **CH. R. Farrar(2007)**., The alternative ways can be followed to implement this concept widely with an economical manner. The adding and embedding the sensors will affect the concrete homogeneity at inside. To overcome those difficulties the Health monitoring should be done intrinsically by creating the metrics by filler conductive material. The addition of these

ASSESSMENT OF CONCRETE STRENGTH WITH REPLACING MISCELLANEOUS COARSE AGGREGATES

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Abstract—**this project describes the effect of different type aggregates on compressive strength of high strength and normal strength concrete. High strength concrete is a type of high performance concrete generally with a compressive strength of 40 N/mm2 or greater and normal strength concrete of 20N/mm2 compressive strength of concrete an experimental program is carried out.**

The different types of coarse aggregate like White Granite, Basalt, and Quartzite are used in this project. Natural sand as fine aggregate and ordinary Portland cement as binding material are used for making concrete mixer. To assess the influence of type of aggregate on compressive strength of concrete cubes of size 150mm x 150mm x 150mm are casted and tested in compression testing machine at the age of 7days,21days and 28 days.

Keywords—Granite, Basalt, and Quartzite & Compressive strength

I. Introduction

Aggregates are as important as cement to form a concrete that is very useful in the construction of buildings. These materials are granular material ingredients of cement and mixes. The same materials constitute about 85% of concrete mixes, by weight. With these characteristics, it is necessary for the material engineer to exercise a responsible selection of these materials to acquire a study and durable mixture. Concrete is a result of a hardened product of carefully proportioned mixture of aggregates, cement, and water.

In order to be useful in construction the product must meet minimum compressive and requirements which are determined through a Mechanical Test of Concrete with Aggregates mechanical test; and to check the strength of the concrete used for bridges, buildings, and other structures where the principal stresses are compressive cube samples were obtained and tested in compression testing machine. In this study, the standard specification from the Compression Testing Machine (CTM) will be used as a minimum compressive strength of 140 kg/cm2 per minute.

In our project we made a cubes of different aggregates like Basalt, White Granite and Quartzite are used and we tested for 7days, 21days and 28 days in compressive testing machine. But our Chittoor district is rich in WhiteGranite, Basalt stone and Quartzite stone and they are easily available

Objectives of the Study:

This study generally focused on the mechanical test such as the compressive Strength of concrete with different aggregates which were available in our local quarry sites.

The study specifically we had the following objectives: 1. To determine the compressive strength of concrete with different aggregates like Granite is available in CTM Road, and Basalt is available in CTM QUARY SITE, Quartzite is available in KOTHA ROAD BIDIKI.

2. To determine the compressive of concrete cubes were prepared with different source of aggregates.

3. To determine the compressive strength of concrete with aggregates is tested under compressive testing machine.

4. The results of compressive strength of concrete cube samples between the source of different aggregates after 7days, 21days, and 28 days of OPC.

II. Related Works

A brief review of available studies related to the present strength properties of cementations materials is presented.

Kaplan (1959) studied the effects of the properties of 13 coarse aggregates on the flexural and compressive strength of high-strength and normal-strength concrete. At all ages, flexural strengths for basalt mixes were higher than limestone mixes with the same mix proportions. The compressive strength for basalt mixes was also higher than limestone mixes; however, the difference in strength was less notable in concretes of higher strength. The flexural strength-to-compressive strength ratios for both basalt and limestone mixes ranged from 9 to 12 percent. Kaplan also observed that concrete with 91-day strengths in excess of 69 MPa (10,000 psi) yielded lower flexural strengths than mortar of the same mix proportions; however, concretes below 69 MPa (1 0,000 psi) yielded similar flexural strengths to mortar of the same mix proportions. Kaplan also observed, contrary to most results, that concrete with compressive strengths greater than 69 MPa (10,000 psi) was generally greater than mortar of the same mix proportions, indicating that at very high strengths, the presence of coarse aggregate contributed to the ultimate compressive strength of concrete.

Walker and Bloem(1960) studied the effects of coarse aggregate size on the properties of normal-strength concrete. Their work demonstrates that an increase in aggregate size from I 0 to 64 mm (%to 2Y. in.) results in a decrease in the compressive strength of concrete, by as much as I 0 percent; however, aggregate size seems to have

Numerical Simulation of Lid Driven Cavity Flow Problem with Aspect ratio effect and Runge-Kutta fourth order method

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Abstract

Incompressible Two-dimensional laminar viscous flow in a square enclosure is examined numerically for various values of Re (Reynolds number). The classical Lid-Driven cavity problem has been solved in Projection technique with fourth order Runge-Kutta fourth order method (MAC-RK4). The uniform fine grid is used in finite difference approximation and the implemented explicit time integration MATLAB code is validated with benchmark results. We extend this methods to study the flow patterns in square enclosure with different aspect ratios (Ar). In addition we tested the accuracy of present numerical computational methods.

Keywords: *Lid driven enclosures, MAC Method, incompressible flow, Runge - Kutta fourth order, Finite difference method.*

1. Introduction

Fluid flow problems are very much interesting subject in the field of science and Engineering. The internal and external incompressible fluid flows are studied many researcher for last few decades. The internal fluid flows are more complex with comparing of external flows due to this reason several researchers developed various numerical techniques to study of internal flow problems. In fluid mechanics the best model for verification of any new numerical method is a classical Lid-driven cavity problem.

Fluid flow behavior is examined several researchers with different values of Reynolds number with different numerical methods. Ghia et al [1] adopted implicit based multigrid method to studied flow characteristics within the enclosure under the flow driven by uniform moving top lid for various values of high Reynolds number. Erturk et al [2] proposed steady incompressible flows Navier-Stokes equations solution numerically with implicit technique. They are applied vorticity stream function formulation for the two-dimensional Navier-Stokes equations and solved with using a fine

Soret and Dufour effects on unsteady MHD free convection in a Walter's-B Viscoelastic flow past a semi-infinite vertical plate

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Abstract

A two-dimensional, unsteady laminar incompressible MHD boundary layer model has been presented for the external flow, heat and mass transfer in a Walters-B viscoelastic buoyancy-driven flow from an impulsively started vertical plate in the presence of Soret and Dufour effects. The Walters-B viscoelastic model has been employed which is valid for short memory polymeric fluids. The dimensionless conservation equations have been solved with the well-tested, robust, highly efficient, implicit Crank Nicolson finite difference numerical method.

Keywords: Vertical plate, Convection, Viscoelastic, Dufour effect

INTRODUCTION

Heat and mass transfer in non-Newtonian fluids is of great interest in many operations in the chemical and process engineering industries including coaxial mixers [1], blood oxygenators [2], milk processing [3], steady-state tubular reactors, and capillary column inverse gas chromatography devices [4], mixing mechanisms [5], bubble-drop formation processes [6], dissolution processes [7], and cloud transport phenomena [8]. Many liquids possess complex shear-stress relationships which deviate significantly from the Newtonian (Navier-Stokes) model. External thermal convection flows in such fluids have been studied extensively using mathematical and numerical models and often employ boundary-layer theory. Many geometrical configurations have been addressed including flat plates, channels, cones, spheres, wedges, inclined planes, and wavy surfaces. Non-Newtonian heat transfer studies have included power-law fluid models [9-11] *i. e.* shear-thinning and shear thickening fluids, simple viscoelastic fluids [12, 13], Criminale-Ericksen-Fibley viscoelastic fluids [14], Johnson-Segalman rheological fluids [15], Bingham yield stress fluids [16], second grade (Reiner-Rivlin) viscoelastic fluids [17], third grade viscoelastic fluids [18], micropolar fluids [19], and bi-viscosity rheological fluids [20]. Viscoelastic properties can enhance or depress heat transfer rates, depending upon the kinematic characteristics of the flow field under consideration and the direction of heat transfer [21].

MATHEMATICAL FORMULATION

An unsteady two dimensional laminar free convective flow of a viscoelastic fluid past a semi-infinite vertical plate is considered. The x-axis is taken along the plate in the upward direction and the y-axis is taken

Buoyancy Effects On MHD Flow Over A Permeable Stretching Sheet Through Porous Stratum

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Abstract: An attempt has been made to study the steady two-dimensional buoyancy effects on MHD flow over a permeable stretching sheet through porous medium in the presence of suction/injection is investigated. Similarity transformations are employed to transform the governing partial differential equations into ordinary differential equations. The transformed equations are then solved numerically by shooting technique. Graphical results are discussed for non-dimensional velocity, temperature and concentration profiles while numerical values are the skin friction coefficient, the local Nusselt number and the local Sherwood number are presented in tabular form for various values of parameters controlling the flow system.

Keywords: *Stretching Sheet, Porous Medium, MHD, Buoyancy Effects and Suction/Injection*

I INTRODUCTION

Transport of heat through a porous medium has been the subject of many studies due to the increasing need for a better understanding of the associated transport processes. This interest stems from the numerous practical applications which can be modelled or can be approximated as transport through porous media such as packed sphere beds, high performance insulation for buildings, chemical catalytic reactors, grain storage, migration of moisture through the air contained in fibrous insulations etc. Literature concerning convective flow in porous media is abundant. Representative studies in this area may be found in the recent books by Nield and Bejan [1], Ingham and Pop [2], Vafai [3], Pop and Ingham [4], Ingham et al. [5], Bejan et al. [6], Vadasz [7], etc.

The problem of viscous flow and heat transfer over a stretching sheet has important industrial applications, for example, in metallurgical processes, such as drawing of continuous filaments through quiescent fluids, annealing and tinning of copper wires, glass blowing, manufacturing of plastic and rubber sheets, crystal growing, and continuous cooling and fibre spinning, in addition to wide-ranging applications in many engineering processes, such as polymer extrusion, wire drawing, continuous casting, manufacturing of foods and paper, glass fibre production, stretching of plastic films, and many others. During the manufacture of these sheets, the melt issues from a slit and is subsequently stretched to achieve the desired thickness. The final product with the desired characteristics strictly depends upon the stretching rate, the rate of cooling in the process, and the process of stretching. The problem of steady hydromagnetic flow and heat transfer over a stretching surface could be very practicable in many applications in the polymer technology and metallurgy. In particular, many metallurgical processes involve the cooling of continuous strips or filaments by drawing them though a quiescent fluid and that in the process of drawing, these strips are sometimes stretched. In the case of annealing and thinning of copper wires, the properties of the final product depend to a great extent on the rate of cooling. By drawing such strips in an electrically conducting fluid subject to a magnetic field, the rate of cooling can be controlled and final products of desired characteristics might be achieved [8]. And also, in several engineering processes, materials manufactured by extrusion processes and heat treated materials travelling between a feed roll and a wind up roll on convey belts possess the characteristics of a moving continuous surface. Very recently, this problem was extended to Eyring-powell fluid by Akbar et al. [9] and to a nanofluid by Hakeem et al. [10] and Mabood et al. [11]. Also, the MHD stretching problem has been studied by several authors, namely Rashidi et al. [12], Erfani et al. [13], Takhar et al. [14], Jafar et al. [15], Ishak et al. [16], etc. Rapits *et al.* [17] studied the effect of thermal radiation on the magnetohydrodynamic flow of a viscous fluid past semi-infinite stationary plate. Later Aliakbar *et al.* [18] analyzed the influence of thermal radiation on MHD flow of Maxwellian fluids above stretching sheets.

The aim of the present study was analyze the steady two-dimensional buoyancy effects on MHD flow over a permeable stretching sheet through porous medium in the presence of suction/injection into account. We have extended the work of Yasin et al. [19] to study the effect of MHD heat and mass transfer stretching sheet with radiation effect. Using the similarity transformations, the governing equations have been transformed in to a set of ordinary differential equations, and the resultant equations are solved using shooting technique. The results are analyzed for various physical parameters such as magnetic field, Thermal Grashof number, Solutal Grashof number, Prandtl number, Schmidt number, Stretching sheet and suction/injection parameter on the flow, heat and mass transfer characteristics.

II MATHEMATICAL FORMULATION

Consider a steady two dimensional, electrically conducting viscous and incompressible fluid over a permeable stretching sheet with porous medium and buoyancy effects are taken into consideration. The velocity of the stretching sheet is assumed in the form $\lambda u_w(x)$, with $\lambda > 0$ for a stretching surface, where $x-$ and $y-$ axes are measured along the stretching surface and normal to it, respectively, and the flow being confined to $\lambda > 0$. It is assumed that the surface is permeable and the mass flux velocity is v_w with $v_w < 0$

Explicit finite difference analysis of Casson fluid flow in parallel plate channel with moderate values of Reynolds number

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ABSTRACT

Transport phenomenon within a fluid, namely momentum is plays vital role in nature, industries and all branches of engineering and sciences. The fluids of most interest to engineers are complex in terms of their rheological and transport properties. This study is focused on solution of the boundary layer flow of Casson fluid in a parallel plate channel with different values of Reynolds number. we note that a positive linear relationship between fully developed length and Reynolds number. Horizontal velocity profile of the flow has a parabolic shape when the flow is fully developed.

1. INTRODUCTION

Fluid flows within the channels are of interesting phenomenon in science and Engineering even in everyday life. Fluid flow within the channels like air ducts, pipes are exclusively in contact with rigid boundaries. As per the engineering needs most of the closed channels are either rectangular or circular. The flow of a non-Newtonian Casson fluid within the parallel plate channel creates a remarkable imprint in research engineering activities. Szeri et al. [1] studied the occurrence of fluid flow within a finite parallel plate duct, with numerical approach theoretically predicted the velocity profile for laminar and turbulent modes and found a good agreement between predicted and experimental values. Sarojamma et al. [2] analyzed the flow, heat and mass transport phenomenon on MHD Casson fluid within a parallel plated duct in presence of Stretching walls surrounded by transverse Magnetic field. With RK fourth order shooting technique they discussed the impact of governing parameters on fluid flow variables with their study it was revealed that the magnetic field strength and fluid velocity diminishes with the rise of temperature.

Das et al. [3] investigated the blood flow phenomenon within a constricted blood

Soret and Dufour Effects on MHD free convection flow of heat and mass transfer over a stretching sheet in a porous medium with heat soure/sink

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Abstract:

The present analyzes the two-dimensional, steady, viscous, incompressible, electrically conducting and laminar MHD free convection flow with soret and dufour effects by taking porous medium and heat generation/absorption in to account. The governing equations are approximated to a system of non-linear ordinary differential equations by similarity transformation. Numerical calculations are carried out for various values of the dimensionless parameters of the problem. The results are presented graphically and the conclusion is drawn that the flow field and other quantities of physical interest are significantly influenced by these parameters.

Keywords:
Heat and Mass Transfer, MHD, Stretching Sheet and Porous Medium

INTRODUCTION

The study of Magnetohydrodynamic (MHD) flows have stimulated extensive attention due to its significant applications in three different subject areas, such as astrophysical, geophysical and engineering problems.Free convection in electrically conducting fluids through an external magnetic field has been a subject of considerable research interest of a large number of scholars for a long time due to its diverse applications in the fields such as nuclear reactors, geothermal engineering, liquid metals and plasma flows. Steady and transient free convection of an electrically conducting fluid from a vertical plate in the presence of magnetic field was studied by Gupta [1]. Lykoudis [2] investigated natural convection of an electrically conducting fluid with a magnetic field. Al-Azab [3] numerically studied the transient MHD free convective heat and mass transfer over a moving vertical surface in the presence of a homogeneous chemical reaction of first order. Palani and Srikanth [4] studied the MHD flow of an electrically conducting fluid over a semi-infinite vertical plate under the influence of the transversely applied magnetic field. Makinde[5] investigated the MHD boundary layer flow with the heat and mass transfer over a moving vertical plate in the presence of magnetic field and convective heat exchange at the surface. Takhar et al. [6] computed flow and mass transfer on a stretching sheet under the consideration of magnetic field and chemically reactive species. They focused that the energy flux can be produced by both of the temperature gradient and concentration gradient.

The energy flux caused by concentration gradient is called Dufour effect and the same by temperature gradient is called the Soret effect. These effects have a vital role in the high temperature and high concentration gradient. The significant Soret effect in convective transport in clear fluids has been found in the work of Bergaman and Srinivasan [7] and Zimmerman et al. [8]. The effect of magnetic field on heat and mass transfer from vertical surfaces in porous media considering Soret and Dufour effects have been performed by Postelnicu [9]. Alam et al. [10] analyzed the Dufour and Soret effects on steady MHD combined free forced convective and mass transfer flow past a semi-infinite vertical plate. Shankar et al.[11] examined the Soret and Dufour effects on the MHD natural convection over a vertical surface embedded in a Darcy porous medium in the presence of thermal radiation. Numerical investigation of Dufour and Soret effects on unsteady MHD natural convection flow past vertical plate embedded in non-Darcy porous medium was investigated by Al-Odat and Al-Ghamdi [12]. Ali-Chamkha and Mansour[13] examined the effect of chemical reaction, thermal radiation, and heat generation or absorption on the unsteady MHD free convective heat and mass transfer along an infinite vertical plate. Soret and Dufour effects on mixed convection from an exponentially

To Find Split Strong Dominating Set of an Interval Graph Using an Algorithm

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Abstract

Strong and weak domination arise naturally in certain practical situations. For example, consider a network of roads connecting a number of locations. In such a network, the degree of a vertex v is the number of roads meeting at v. Suppose $\deg u > \deg v$. Naturally, the traffic at u is heavier than that at v. If we consider the traffic between u and v, preference should be given to the vehicles going from u to v. Thus, in some sense, u strongly dominates v and v weakly dominates u. In this paper we present an algorithm to find a strong dominating set and split strong dominating set of an interval graph which isconnected.

I. Introduction

We have defined a graph as a set a certain relation on that set. It is often convenient to draw a "picture" of the graph. This may be done in many ways usually one draws an interval graph corresponding to I for each vertex and connects vertex u and vertex v with a directed arrow whenever uv is an edge. If both uv and vu are edges then some times a single line joints u and v without arrows.

Let $I = \{I_1, I_2, I_3 \ldots I_n\}$ be the given interval family. Each interval i in I is represented by $[a_i, b_i]$, for $i = 1,2,3..n$. Here a_i is called the left endpoint and b_i is called the right endpoint of the interval I_i. Without loss of generality we may assume that all end points of the intervals in I which are distinct between 1 and 2n. the intervals are labeled in the increasing order of their right endpoints. Two intervals i and j are said to intersect each other, if they have non-empty intersection. Interval graph play important role in numerous applications, many of which are scheduling problems. They are a subset of perfect graphs [1]. A graph $G = (V, E)$ is called an interval graph if there is a one-to-one correspondence between V and I such that two vertices of G are joined by an edge in E if and only if there corresponding intervals in I intersect. That is, if $I = [a_i, b_i]$ and $j = [a_j, b_j]$, then i and j intersect means either $a_i < b_j$ or $a_j < b_i$.

Let G be a graph, with vertex set V and edge set E. the open neighbourhood set of a vertex $v \in V$ is

$$nbd[v] = \{u \in V / uv \in E\}$$

The closed neighbourhood set of a vertex $v \in V$ is

$$nbd[v] = nbd(v) \cup \{v\}$$

A vertex in a graph G dominates itself and it'sneighbours. A set $D \subseteq V$ is called dominating set if every vertex in $< V - D >$ is adjacent to some vertex in D. the domination studied in [2 – 3].

The domination number γ of G is the minimum cardinality of a dominating set. The domination number is well-studied paramenter. We can see this form the bibliography [4] on domination. In [5], sampathkumar and pushpalatha have introduced the concept of strong domination in graphs. Strong domination has been studied [6 – 67]. Kulli.V.R. etc… all [8] introduced the concept of split and non-split domination in graphs. A domination number of γ_s of G is the minimum cardinality of a split dominating set. Let $G(V, E)$ be a graph and $u, v \in V$. Then u strongly dominates v if

(i) $uv \in E$

(ii) $\deg v \le \deg u$.

A set $D_s \subseteq V$ is a strong dominating set of G if every vertex in $V - D_s$ is strongly dominated by atleastmone vertex in D_s. The strong domination number $\gamma_s(G)$ of G is the

Electroanalysis and determination of Mancozeb pesticides using polyaniline modified electrode as Nanosensor

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***Abstract*— Polyaniline (PAN) coatings were electrodeposited on the surface of glassy carbon electrode (GCEs) to form new electrodes, i.e. PAN/GCEs. An electrocatalytic method has been proposed to determining dithiocarbamate-based fungicide Mancozeb using a Glassy carbon electrode modified with polyaniline was studies in aqueous solutions by Differential Pulse Voltammetry (DPV), Cyclic Voltammetry (CV) and Linear Sweep Voltammetry (LSV). A linear response over an Mancozeb in the range of concentration of 0.01M to 4.5×10-7M. The high sensitivity and selectivity of those electrodes were demonstrated by its practical application to the determination of trace amount of Mancozeb in milk and serum samples.**

Keywords: PAN/GCEs, Mancozeb, DPV, CV, LSV.

I. INTRODUCTION

Mancozeb (C4H6MnN2S4)x(Zn)y, an ethylene bis-dithiocarbamate (EBDC), has been one of the most commonly used fungicides in commercial use for several decades. The active ingredient, Mancozeb [(manganese ethylene bis(dithiocarbamate) (polymeric) complex with zinc salt)], is a contact fungicide in a subclass of carbamate pesticides called dithiocarbamates (DTCs)[1, 2]. Ethylene bis-dithiocarbamate (EBDC) base pesticides (including Nabam, Mancozeb, Ferbam, Maneb, and Zineb) have been widely used as broad-spectrum fungicide, bactericide, and algaecide. These have been widely used to control algae in rice field as well as the fungal diseases of fruits, vegetables, paddy and ornamental plants [3, 4]. DTCs also a chelating agent with various metal ions, such as Fe^{+2}, Mn^{+2}, Cu^{+2}, Na^{+}, Zn^{+2} and Ni^{+2} to form coordination complexes and to act as a fungicide [5].

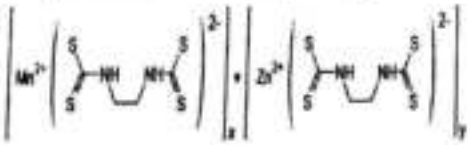

Fig.1 Molecular structure of Mancozeb

II. INSTRUMENTATION

Experiments were conducted with AUTOLAB PGSTAT 101 supplied by Metrohm, The Netherlands. All electrochemical experiments such as polymerization of PANI and measurements were performed using an electrochemical workstation, having a conventional three-electrode cell configuration with a GCE or PAN/GCE of a diameter of 3 mm as the working electrode, saturated calomel electrode (SCE) as a reference electrode and platinum wire as a counter electrode. Electrochemical experiments were carried out in a 2-mL voltammetric cell or a flow injection system at room temperature (25°C) [6]. All potentials are referred to the Ag/AgCl reference electrode. All potentials are quoted vs. SCE reference electrode. All pH measurements were made with the aid of a digital pH meter using a combined glass electrode.

III. REAGENTS

Aniline monomers were freshly distilled under a reduced pressure and stored at a low temperature (-5°C) in a nitrogen atmosphere. Acetic acid and sodium acetate were used for the preparation of a 0.1M acetate buffer solution. The working solutions were prepared by dilution from the stock solution. The stock solution of Mancozeb was prepared by dissolving in 0.1N HCl and make up with doubly distilled water and stored at room temperature. Acetate buffer of the pH 4.5 was prepared by 982.3 ml of 0.1M acetic acid and 17.7 ml of 0.1 M sodium acetate (tri-hydrate). All the chemicals used were of analytical reagent grade (Merck,).

Bioactive Compounds in Mango Peels and Their Extraction

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***Abstract*—A lot of Mango peels wastes will be generated after fruit processing. These peels are a good source of usefulchemicals like phenolic compounds that havegood antioxidant properties. This study investigated the extraction of phenolic compounds from the waste mango peels using subcritical water extraction method (SCW). Experiments were performed in a batch laboratory-built equipment (50 ml standard flask) immersed in water bath and temperatures ranging from 150 to 200 °C, extraction time of 30min to 120 min., solid to waterratioof1:10to1:50andpHofsolution2to8.Thehighest phenolic content was obtained 50.25 mg GAE / g DW at the condition as follows: 180 °C, 90 min, solid to water ratio as 1:40 and pH 4. The amount of phenolic compounds from mango peels using SCW extraction was higher than that using soxhlet extraction at extraction time 60 min as 1.5 times. SCW extraction might be an alternative green technology for phenolic compounds extraction from agricultural wastes which substitute conventional method using organicsolvents.**

***Index Terms*—Subcritical water extraction, phenolic compounds, mango peels.**

I. Introduction

Fruits and vegetables are the major sources of natural antioxidants and contain various kinds of antioxidant compoundssuchasvitaminC,vitaminE,carotenoids,lutein, and lycopene. Among these compounds, Phenolic compounds represent a majority of natural antioxidants presentlyidentified[1].Ithasabilitytoscavengefreeradicals and exhibits antimutagenic, anticarcinogenic, antiglycemic, anticholesterol, anti-inflammatory and antimicrobial properties [2]. Phenolic compounds can be used as ingredients in cosmetics, pharmaceuticals, nutraceuticals and food. For application in food, it can be used to prevent oxidation of food containing high amounts of liquid [3]. Phenolic compounds were found in various fruits and vegetables. Some agricultural wastes from the fruit can industry such peels of mango have been found to be a rich source of antioxidant phenolic compounds [4],[5].

The mango (Mangiferaindica L.), which belongs to the familyanacardiaceae,isthemostcultivatedfruitinThailand. Processed mango products are among the major goods exported from Thailand. Major byproducts of mango processing are peels and seeds, amount of 35 and 60% ofthetotal fruit weight, respectively. The peel and seed of mango has a significant potential benefit due to its powerful antioxidant properties and high content of phenolic compound [6]. The major phenolic compounds of ripe and unripe mango peels were gallic acid, syringic acid, gentisyl-protocatechuic, mangiferin, ellagic acid, and quercetin that these phenolic compounds can be a good source of natural antioxidant and can use in food, pharmaceutical and cosmetics industries.

The conventional methods used currently for phenolic compounds extraction such as soxhlet and maceration. During soxhlet, fresh solvent can repeatedly bring to contact with sample many times and the system remains high temperature. Maceration is very sample method that is just soaking materials in solvent for long time extraction [7]. These techniques use organic solvent (such as methanol, ethanol, ethyl acetate, ether, acetronitride) for extraction. Low extraction efficiency and toxic solvent residues in the extracts occurs when using these technologies. Recently, Subcriticalwaterextraction(SCW)hasbecomeanincreasing alternative technology in the extraction of phenolic compounds. Subcritical water, also called pressurized (hot water), superheated water or hot liquid water, it refers to water at temperature between 100 and 374°C and at a pressure which is high enough to maintain the liquid state (below the critical pressure of 22 MPa). The most important advantagesofSWEovertraditionalextractiontechniquesare shorter extraction time, lower cost of the extracting solvent, higherqualityoftheextractionandenvironment-friendly[8]. SCW extraction has been used for the extraction of phenolic compounds from potato peel [4]. They demonstrated that the high recoveries of phenolic compounds were obtained 81.83 mg / 100g. wet basis (wb) at 180 °C and extraction time 30 min., meanwhile these compared to 3 h extraction with methanol was 49.59 mg / 100 g. wb) and also SCW found Chlorogenic acid (CGA) (14.59 mg / 100 g. wb) and Gallic acid (GAE) (29.56 mg /100 g. wb). The extraction of phenolic compounds from pomegranate seed residues (PSR) using SCW extraction was reported that the highest total phenolic compounds was obtained at 220 °C, 30 min and solid to water ratio of 1:40 [9]. SCW was used to extraction of polyphenolic compounds from Terminalia chebulaRetz.fruits that found the amounts of extracted gallic acid (GA) and ellagic acid (EA) increased with an increasing in subcritical water temperature up to 180 °C, while the highest amount of corilagin (CG) was recovered at 120 °C. Moreover, water volumetric flow rate affected the extraction behavior and concluded the suitable flow rate for extraction of total phenolic compounds was 4 ml/min[10].

The objective of this work were to extract phenolic compounds from mango peels by subcritical waterextraction (SCW) according to green technology, also to investigated the effect of extraction parameters on the total phenolic content (TPC) and comparative extraction efficiency with conventional method.

II. Materials And Methods

A. Materials

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Recent Applications in Biosensors– A Review

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Abstract— **Biosensors are devices that combine biological materials and transducers for the detection of sample e.g. drugs, metabolites, pollutants, microbial load, control parameters etc. by converting biochemical signals into measurable physiochemical signals which in turn quantify the amount of sample. The various types of biosensors such as enzyme-based, tissue-based, immunosensors and DNA biosensors, thermal and piezoelectric biosensors have been deliberated here to highlight their indispensable applications in multitudinous fields. Since the first glucose biosensor developed by Clark in 1962. Fluorescent biosensors play a vital role in drug discovery and in cancer. Biosensor applications are prevalent in the plant biology vector to find out the missing links required in metabolic processes. Recently nano-biosensors, implanted biosensors and integrated biosensors are in current research and development.**

Keywords— Biosensors, Tissue based immunosensors, Enzyme based immunosensors.

I. Introduction

Biosensor is an analytical device that converts biological reactions into measurable signals like an electrical signal which is proportional to analyte concentration. The term "biosensor" was coined by Cammann[1] and its definition was introduced by IUPAC[2-4].

Recent advances from the convergence of nanotechnology and biotechnology are accelerating the development of sensor research. Nanostructured materials, for example metal nanowires, have the properties of novel optical, electrical, catalytic, and magnetic properties, which make the nanowires the promising sensing materials for ultrasensitive, trace-level biological and chemical nano-sensors.

Fabrication of biosensors, its materials, transducing devices, and immobilization methods requires multidisciplinary research in chemistry, biology, and engineering. The major advantage of using biosensor as compared to the other conventional techniques used for measurement of analyte like biochemical assays, immunoassays and PCR based assays is that the sample can be used with no prior clean up, reusability and rapid response along with high specificity. The aim of this article was to give a brief overview history, types, applications and future advances in the field.

II. Material and Methods

Data for this review were obtained by searching research papers with key words "biosensor types", "biosensor applications", "nanobiosensors", "biochips", "current research on biosenors" "google", and all articles based on its applications were selected.

III. History

The first biosensor was invented by Professor Leland C Clark Jnr. and he is known as the father of the biosensor concept. In 1956, Clark published his definitive paper on the oxygen electrode. The concept was illustrated by an experiment in which glucose oxidase was entrapped at a Clark oxygen electrode using dialysis membrane (Turner, 1996). This biosensor was made from a thin layer of glucose oxidase (GOx) on an oxygen electrode. The amount of glucose was estimated by the reduction in the dissolved oxygen concentration.

Clark's ideas became commercial reality in 1975 with the successful re-launch (first launch 1973) of the Yellow Springs Instrument Company (Ohio) glucose analyser based on the amperometric detection of hydrogen peroxide (Turner 1996). In 1963 Garry A. Rechnitz together with S. Katz introduced one of the first papers in the field of biosensors with the direct potentiometric determination of urea after urease hydrolysis.

In 1969 George Guilbault introduced the potentiometric urea electrode. In 1973 Ph. Racinee and W. Mindt developed a lactate electrode. In 1976 came the first microbe-based biosensor and finally in 1977 Karl Cammann introduced the term "biosensor". In 1979 pioneering work by J. Kulys using artificial redox mediators and in 1984 Cass et al. introduced first ferrocene-mediated amperometic glucose biosensor which was commercialised by MediSense Inc. in 1987. In 1997 IUPAC introduced for the first time definition for biosensors in analogy to the definition of chemosensors. In 2007 an implanted glucose biosensor (freestyle Navigator system) operated for five days[5] and the work on biosensors continues to advance exploiting enzymes, antibodies, microbes in combination with various types of transducers.

IV. Types of Biosensors

The first enzyme-based sensor was reported by Updike and Hicks in 1967. Enzyme biosensors have been devised on immobilization methods, i.e. adsorption of enzymes by van der Waals forces, ionic bonding or covalent bonding. The commonly used enzymes for this purpose are oxido-reductases, polyphenol oxidases, peroxidases, and amino-oxi dases[6-8].

The first microbe-based or cell-based sensor was actualized by Diviès[9]. The tissues for tissue-based sensors arise from plant and animal sources. The analyte of interest can be an inhibitor or a substrate of these processes. Rechnitz[10] developed the first tissue based sensor for the determination of amino acid arginine. Organelle-based sensors were made using membranes.

Nanomaterials for the Removal of Heavy Metals from Wastewater - A Review

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ABSTRACT

Removal of contaminants in wastewater, such as heavy metals, has become a severe problem in the world. Numerous technologies have been developed to deal with this problem. As an emerging technology,nanotechnology has been gaining increasing interest and many nanomaterials have been developed to remove heavy metals from polluted water, due to their excellent features resulting from the nanometer effect. In this work, novel nanomaterials, including carbon-based nanomaterials, zero-valent metal, metal-oxide based nanomaterials, and nanocomposites, and their applications for the removal of heavy metal ions from wastewater were systematically reviewed. Their efficiency, limitations, and advantages were compared and discussed. Furthermore, the promising perspective of nanomaterials in environmental applications was also discussed and potential directions for future work were suggested.

Keywords: Nanomaterials, heavy metal, wastewater, carbon-based nanomaterials, metal oxide, Nanocomposite.

INTRODUCTION

Waterisoneofthemostimportantnaturalresourcesinthe world,whichisvitalforthesurvival of all living beings and the development of humans. Along with the acceleration of industrialization and urbanization, the consumption of water is increasing rapidly and water scarcity problem has become an important constraint for economic development. In the meantime, water contamination, especially heavy metals pollution inside water, has become a global environmental issue. Heavy metalscouldbereleasedintowatermainlythroughthemining ,electroplating,metallurgy,chemical plants, agriculture and household wastewater etc. Heavy metals such as Pb, Zn, Cu, Hg, etc. could poseaseverethreattohuman'shealthbecausetheycanbeacc umulatedbiologicallyinthefoodchain. For example, heavy metals could cause damages to the kidneys, mental and central nervous functions,lungs,andotherorgans.

Therefore, the removal of heavy metals from water is of great importance and has drawn tremendous attention. Up till now, numerous technologies have been developed to solve this problem, including chemical precipitation, ion exchange, adsorption, membrane filtration, electrochemical treatment, Among the techniques discussed above, adsorption is one of the most extensively used

In general, nanomaterials are materials whose external dimensions are in the nanoscale (usually 1 nm–100 nm) or those who have a nanoscale internal structure/surface. Under the nanoscale, nanomaterials often exhibit some special properties, such as a surface effect, small size effect.

some nanomaterials for heavy metal removal including the carbon-based nanomaterials, metal/metal oxide nanoparticles, and polymer- supported adsorbents were simply reviewed.

These nanomaterials have shown their great potential for wastewater treatment due to their high adsorption capacity and selectivity.

Nanomaterials for Removing HeavyMetals

1.Carbon-BasedNanomaterials

Carbon-based nanomaterials were initially applied in the electronics industry owing to their extraordinarythermalandelectricalproperties.Neverthe less,someotherexceptionalproperties they exhibited, such as a large surface area, ease of chemical or physical modification, ability of removing both organic, and inorganic pollutants have made carbon-based nanomaterials potential alternatives for treating wastewater. Here, two major carbon-based nanomaterials are mainly presented—carbon nanotube-based and graphene-based nanomaterials.

1.1 CarbonNanotubes

Structural, optical and magnetic properties of Ni doped ZnS nanoparticles

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Abstract: Nickel doped zinc sulfide nanoparticles ($Zn_{1-x}Ni_xS$) at x = 0.00, 0.02, 0.05, 0.08 & 0.10 were prepared by solid state reaction. The (nickel sulfide) NiS and (zinc sulfide) ZnS nanoparticles in desired ratios were taken, mixed and ground for 6 hrs at a speed rate of 300 rpm using a planetary ball mill. The structural, optical, luminescence and magnetic properties of the $Zn_{1-x}Ni_xS$ nanoparticles were characterized by Powder X-ray diffraction (XRD), UV-Vis-NIR diffuse reflectance spectroscopy, photoluminescence (PL) spectroscopy and vibrating sample magnetometer (VSM). No change in crystal structure was observed from XRD by substitution of Ni into ZnS lattice. The mean crystallite size was found to be 37 nm. The band gap of $Zn_{1-x}Ni_xS$ nanoparticles decreased from 3.57 eV to 3.37 eV on increasing the dopant concentration. The room temperature Photoluminescence (PL) spectra of $Zn_{1-x}Ni_xS$ nanoparticles showed two broad and intense emission peaks at 420 nm and 438 nm with excitation wavelength of 330 nm. The $Zn_{1-x}Ni_xS$ nanoparticles shown ferromagnetism at 100 K and at room temperature (300 K) and the strength of magnetization increased with Ni concentration. The maximum magnetization value (0.18 emu/g) observed for x = 0.10 at 100 K.

Keywords: XRD, Photoluminescence, Photoelectron Capture, Room temperature ferromagnetism, Semiconductors.

1. Introduction

At present high priority has been given for the search of new class of semiconductors which can be used in spintronic devices applications. The new frontier of electronics is called as spintronics in which one can make use of both charge and spin of electrons. The semiconductors which can show this kind of facility are called dilute magnetic semiconductors (DMS). The Dilute magnetic semiconductors (DMS) or semi magnetic semiconductors (SMSC) are of II-VI, IV-VI and III-V compound semiconductors in which a small quantity of either magnetic or non-magnetic ions can be substituted in the host semiconductor ions. Till now many transition metal ions or rare earth metal ions such as Mn, Co, Cr, Ni, Sm, Dy, Gd, etc were substituted into the host semiconductors and converted non-magnetic semiconductors into magnetic semiconductors. These DMS materials increase the curiosity of present research community because of their excellent magnetic, optical and electroncal properties due to the sp-d interactions between the spins of the conduction electrons and localized spins of magnetic electrons. Among the various II-VI semiconductors, ZnS is one of the most promising materials which can find in potential applications due to its wide band gap (3.6 eV)[1]. It is commercially used as phosphor and electro luminescent devices. Very few articles are available on different transition metal (Cu,Co,Mn,Fe etc) doped ZnS nanoparticles [2-5]. Among these transition metal

Effect of PEG on (PEO+PEMA+$NaIO_4$) Complexed Polymer Blend Electrolyte by using (PEG) as a Plasticizer

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Abstract — The effect of plasticizer on the properties of polymer blend electrolyte based on (PEO+PEMA) complexed with $NaIO_4$ has been prepared by solution cast technique for solid state battery applications. Miscibility studies were performed using X- ray diffraction (XRD). Frequency dependent conductivity (σ_{ac}) values were obtained from complex impedance (cole-cole) plots. It was observed that the conductivity increases with increase in the concentration of PEG upto 10 wt%. For further increase in the concentration of PEG (15 wt%), the conductivity decreases. The charge transport mechanism in these electrolytes is mainly due to ions which were confirmed by the transference number experiment. Using this electrolyte, cells were fabricated and their discharge profiles were studied under constant load. Several cell parameters associated with the cells were evaluated.

Key words: Solid State Battery, XRD, Cole - Cole Plots, Conductivity, Transference numbers and Discharge Profiles.

1. Introduction

Recently, polymer electrolytes have been widely studied due to their applicability for a variety of solid state and electrochemical device applications including batteries, fuel cells, supercapacitors, electrochromic devices and chemical sensors [1]. Polymer electrolytes have many advantages, such as flexibility, ease of processing into thin films of large surface area, electrochemical stability and leak-proof nature [2]. Various approaches such as blending [3, 4], copolymerization [5], plasticization [6], addition of ceramic fillers [7] etc. have been made to enhance the ionic conductivity of polymer electrolytes [8]. The most important advances in increasing the ionic conductivity of polymer electrolytes were brought into effect by the incorporation of suitable amounts of plasticizers [9]. Generally, low molecular weight, high dielectric constant polar organic solvents such as ethylene carbonate (EC) [10, 11], propylene carbonate (PC) [12], polyethylene glycol (PEG) [13], dimethylformamide (DMF) [5], dimethylsulfoxide (DMSO) [14], dioctyl phthalate (DOP) [15] and dibutyl phthalate (DBP) [16] have been used in polymer electrolytes to enhance their room temperature ionic conductivities. The conductivities of these electrolytes critically depend on the physical properties of the plasticizer such as its viscosity and dielectric constant. A plasticizer improves the electrical conductivity of polymer electrolyte by (i) increasing the amorphous content of polymer electrolytes; (ii) dissociating ion aggregates present in polymer electrolytes; (iii) lowering the glass transition temperature, Tg [17].

The present work is concerned with PEG used as a plasticizer in (PEO+PEMA+$NaIO_4$) polymer electrolyte. Several experimental techniques such as XRD, electrical, transference measurements and discharge profiles were performed to characterize these plasticized polymer blend electrolytes.

2. Experimental

Polymer electrolyte films of PEO/PEMA complexed with $NaIO_4$ at different compositions were prepared by solution cast technique using DMF as solvent. Film of (42.5PEO:42.5PEMA:15$NaIO_4$) composition was identified as the highest conducting composition at room temperature on the basis of PEO/PEMA – $NaIO_4$ salt concentration dependent conductivity which were obtained from complex impedance plots. Na^+ ion conducting plasticized PEO/PEMA blended solid polymer electrolyte (SPE) membranes, (100-x)[42.5PEO : 42.5PEMA : 15$NaIO_4$] : xPEG where x = 5%, 10% and 20% were also prepared. The X-ray diffraction studies of these films were performed by means of a SEIFERT X-ray diffractometer system with Ni-filtered Cu kα radiation. The AC conductivity was measured using PSM 1700 Impedance Analyzer in the frequency range 1 Hz – 1 MHz and in the temperature range 303-373 K. The total ionic transport number (t_{ion}) was evaluated by means of Wagner's polarization technique [18]. Electrochemical cells were fabricated with the configuration Na/ (PEO+PEMA+$NaIO_4$+PEG)/ (I_2+C+electrolyte). The discharge characteristics were monitored under a constant load of 100 kΩ.

3. Results and Discussions

3.1 x-ray diffraction studies

Fig 3.1 shows the comparative profiles of the XRD patterns of (100-x) [42.5PEO+42.5PEMA+15NaIO4] : xPEG where x = 5, 10, 15 wt% solid polymer electrolytes. The diffraction peaks observed for 2θ values at 19.1° and 23.3° were found to be less intense in PEG plasticized films compared to the NaIO4 complexed (PEO+PEMA) polymer blend films and no new peaks were observed. This indicates that the addition of plasticizer caused a further decrease in the degree of crystallinity of the film and increased the amorphous phase. The increase in the amorphous nature causes a reduction in the energy barrier to the segmental motion of the polymer electrolyte [19]. The intensity of the

Thermally Evaporated Cu_2O Thin Films for solar cells

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Abstract:

This paper deals with growth of Cu_2O thin films using thermal evaporation technique. It also discusses the photovoltaic properties of solar cells that use the active layer of p-type Cu_2O thin films prepared by thermal evaporation. Such a film was formed at 303K – 573K on a corning 7059 glass substrate, and this film produced on a substrate with a (111) plane of Cu_2O orientation was oriented only in the (111) plane. The crystalline size of the produced Cu_2O thin film (42 nm) was larger than that of the film produced on FTO (SnO_2: F) (14.6 nm). The resistivity of the films decreased from 9.5×10^{1} Ω cm to 2.7×10^{1} Ω cm and Hall mobility of the films increased from 2.3 cm^2/V sec to 18 cm^2/V sec with increase of substrate temperature. The carrier concentration of the films decreased from 2.9×10^{15} cm^{-3} to 1.5×10^{15} cm^{-3} and also optical band gap of the films increased from 1.86 eV to 2.05 eV with increase of substrate temperature from 303K to 573K. The structural properties of Cu_2O film were studied by X-ray diffraction technique (XRD). The optical properties of the films were recorded using UV-VIS-NIR double beam spectrophotometer. The thickness of Cu_2O films investigated was in the range 2000 A°. Such films were highly used in the fabrication of gas sensors, heterojunction solar cells, and electro chromicdevices. A systematic study will be taken in future for the effective utilization of these films in device applications.

1. Introduction:

The need of low cost energy sources will play a great role in both technology and research. The aim of research and development in energy sector is to reduce the energy cost. At present there is abnormal increase in the expenditure of energy as everybody is in need of the energy sources for existence. But no country can depend on the fossil fuels indefinitely as they deplete in long run with gradual increase of population. Utilization of solar energy will solve world's energy in need. A solar cell received much attention of converting sunlight to electricity. Doped semiconductors are used for fabrication of solar cells. Due to the optical and electrical properties, metal oxide semiconductor films have been widely studied and have received considerable attention.

Cuprous oxide (Cu_2O), a p-type direct band gap semiconductor with band gap energy of 2.1 eV has been regarded as one of the most promising material used for optoelectronic applications recently. The increase in attractiveness has several reasons.

1) Cu_2O is a potential photovoltaic material due to the low cost, non toxicity and natural abundance of the base material.

2) It has high optical absorption coefficient, reasonably good photovoltaic properties.

3) It has direct band gap of 2.10 eV, which is in the acceptable range for solar energy.

4) Production of large area devices with [illegible] possible.

5) It has relatively low activation energy 0.14 eV.

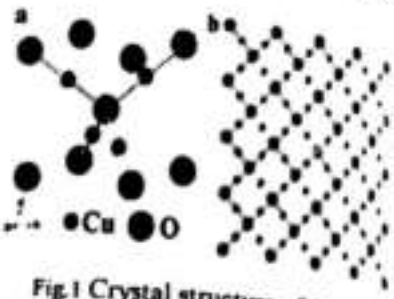

Fig.1 Crystal structure of Cu_2O

2. Experimental:

Vacuum coating system:

A vacuum coating system, developed in [illegible] laboratory, was used for the deposition of Cu_2O [illegible] on corning 7059 glass substrate. Production of [illegible] necessary vacuum in a chamber is the [illegible] requirement of vacuum evaporation technique. [illegible] vacuum employed in the present investigation [illegible] 10^{-6} mbar. Hind Hivac vacuum coating [illegible] 12 A4) has been employed for the preparation of [illegible] films. A 12'' diameter glass bell jar is mounted [illegible] the top of flange of the high vacuum baffle [illegible] Silica oil 704 DC is used as the charge of [illegible] diffusion pump. This has been chosen because of [illegible] low vapor pressure of the order 10^{-8} mbar and [illegible] resistance to oxidation in the working temperature range.

A pirani and penning gauges were provided to the vacuum system, to measure the vacuum [illegible] system. A pirani gauge measures a vacuum of [illegible] of 10^{-3} mbar. The penning gauge is a cold cathode ionizing gauge and measures vacuum of the order [illegible]

Luminescence Properties of Ho^{3+} Ions Doped $BaGd_2Ti_4O_{12}$ Ceramics for Photonic Applications

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Abstract

Ho^{3+} (5 mol %) ions doped Barium Gadolinium Titanate ($BaGd_2Ti_4O_{12}$) powder ceramics were synthesized by solid state reaction method. From the X-ray diffraction profiles it is observed that the prepared ceramics were crystallized in the form of orthorhombic structure. Agglomeration and the nanometer particle size were observed from the SEM images of the ceramics. The emission spectrum Ho^{3+}: $BaGd_2Ti_4O_{12}$ powder ceramics has shown *blue* emission at 467 nm ($^5F_3 \rightarrow {}^5I_8$) with an excitation wavelength 208 nm.

Key words: XRD, SEM, Emission, Excitation.

1. Introduction

One of the most important electro ceramics is barium titanate. Barium titanate is a good dielectric material with a high dielectric constant and it is a ferroelectric, piezoelectric and pyroelectric with good nonlinear optical properties. Barium titanate compound is an electrical insulator because of its energy and it has been used for a wide range of scientific and industrial applications such as capacitors, ultrasonic transducers, piezoelectric sensors, Barium titanate ceramics applications in various fields such as optical limiting, switches, flat panel displays, modulated-type optical devices and second harmonic generation. Rare-earth ions doped titanate based phosphors have attracted significant importance for potential applications in white-light emitting diodes [1]. Gadolinium compounds doped with rare earth ions are used as the red phosphors for the preparation of WLEDs and gadolinium containing host lattices are also used for making green phosphors for colour TV tubes. From the literature, it is observed that many authors have been reported on PL analysis of titanate based systems such as gadolinium titanate, zirconium titanate, compounds can find potential applications in optoelectronic devices [2]. Rare earth ions doped ceramic hosts have a wide range of applications in the fields of lamp phosphors, solid state lighting in display devices, white light generation [3]. So far no reports have been made on the photoluminescence property of thulium doped barium gadolinium titanate ($BaGd_2Ti_4O_{12}$) ceramics. In this paper, we report on the synthesis, XRD, SEM and PL analysis of Ho^{3+} ions doped $BaGd_2Ti_4O_{12}$ ceramics for novel applications.

2. Experimental studies

$BaGd_{2-x}Ti_4O_{12}$: RE_x^{3+} (RE = Ho and x = 5 mol %) ceramics were prepared by solid state reaction method. The starting chemicals used for the preparation of these ceramics were purchased

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