2021-2022

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NCRDSET '22

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Organizes

The 6th National Conference on Research and Development in Science, Engineering and Technology

on 27th May, 2022

In association with

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St. Anne's College of Engineering and Technology, approved by AICTE, New Delhi and affiliated to Anna University, Chennai, is situated at Anguchettypalayam, near Panruti. College provides ample opportunities for our students for both training and employment. Our students can reap the benefits from this Institute with proper coordination.

About the Conference

Conferences pave way to bring together people with common interests and discuss issues and ideas related to various topics. Sixth National Conference on Research, Development, Science and Technology 2022 (NCRDSET'22) will target state-of-the-art as well as emerging topics pertaining in the field of Science, Engineering and Technology and effective strategies for its implementation. It also provides a premier interdisciplinary platform for researchers, academicians, industry persons, practitioners, educators and students to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered, and solutions adopted in the fields of innovation. The objective of this National conference is to provide opportunity for the participants to interact and exchange ideas, experience and expertise in the current trend and strategies. Besides this, participants will also be enlightened about vast avenues, current and recent technological developments in various domain and its applications will be thoroughly explored and discussed.

CONFERENCE THEMES

Computer Science

1. AI and Machine Learning
2. Big Data Analytics
3. Cloud and Green Computing
4. Network and Cyber Security
5. IoT and Networking
6. Virtual Reality

Electrical

1. Smart Grid and Microgrid Systems
2. Renewable Energy systems
3. Special Electrical Machines
4. Emerging Trends in Power System
5. Power Electronics Controllers.
6. Energy Storage and Control Techniques

Electronics & Communication

1. Antennas and Microwave devices
2. Quantum Communication and Computing
3. Image, Audio & Video Processing, Pattern Recognition
4. Electronic devices, VLSI, Embedded System and its security
5. Bio-medical Engineering application

Mechanical

1. Advance Trends in Engineering Design
2. Recent Methods in Manufacturing
3. Emerging Trends in Thermal Engineering
4. Computational Field Dynamics
5. Design Tool and Cutting Materials
6. Composite Material
7. Alternative Fuels

Engineering Science

1. Materials for Energy and Environment
2. Smart Materials and Crystalline Materials
3. Material Science and Chemistry
4. Environmental Science
5. Mathematical Analysis and Applications
6. Recent Advancements in Applied Mathematics
7. English Language Teaching Methodology

Important Dates

- Submission of full paper : 19.05.2022
- Intimation of acceptance : 21.05.2022
- Registration : 23.05.2022

Paper Submission

- Authors are invited to submit their full length paper in the prescribed format through http://stannescet.ac.in/NCRDSET22
- All papers submitted to the conference will be peer reviewed and evaluated for its originality, technical content and relevance to the conference theme by the members of review committee and acceptance will be intimated to the author's mail.
- All the accepted papers will be published in the conference proceedings with ISBN Number.
  Note: Papers submitted by email, fax or post will NOT be accepted.

Registration Fee

- UG/PG Students & Research Scholars : Rs.500
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List of Faculty Members received Financial Support for Conference (2021-2022)

S.No	Name of Staff	Title	Support amount received (Rs)	Signature
1	Mr.B.Arunkumar Mr.S.Durairaj Mr.V.Venkatesan	Design and Implementation of Microcontroller Based vehicular Smart Helmet for Safe Journey using sensors	750.00	
2	Mr.B.Arunkumar Ms.M.Sahinippiriya	High Speed Gate Level Synchronous Full Adder Designs	750.00	
3	Mr.R.Radhakrishnan Mr.S.Balabasker	IoT- Based intelligent aquaculture monitoring system for fish farming	750.00	
4	Mrs. D. Uma Maheshwari	Cascade attentive refine net for blood vessels Segmentation of Diabetic Retinopathy	750.00	
5	Dr. S. Anitha	Micro fluidic Syringe Pump	750.00	
6	Mr. P. Saravanabhava	Smart Ration Card using Face recognition	750.00	
7	Ms. V. Brittadevi	Online product price and comparison using web mining and machine learning	750.00	
8	Ms. P. Nivetha	Cyber bullying Detection on Social Network using Neural Networks	750.00	
9	Mrs. E. Indhuma	DL – CNN based hardware state enable using Hand Gesture	750.00	
10	Mrs. Z. Asmathunnisa	Video Compression	750.00	
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12	Mr.K.Saravanan Mr.M.Sivamanikandan Mr.R.Jayakumar	Optimization of Machining Parameter on SS316L Material Using Orthogonal Array Method	750.00	
13	Dr. R. Sasikumar	Experimental Analysis of Diesel Engine using Bio Fuel Blended with Aluminium Oxide	750.00	
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19	Mr. K. Sriram	Cost Saving on Micro Grid Operation using Grey Wolf Optimization Algorithm	750.00	
20	Sr. A. Annai Theresa	A 129-level Asymmetrical Cascaded H-Bridge Multilevel Inverter with Reduced Switches and Low THD	750.00	
21	Mr. J. Ramesh	Monitoring the Microgrid using IoT	750.00	
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27	G.AbiramaSundari S.Ramya	Enhanced Internal Quantum Efficiency of Organic Light-Emitting Diodes: A Synergistic Effect	750.00	
TOTAL AMOUNT			**20250.00**	

ST.ANNE'S COLLEGE OF ENGINEERING AND TECHNOLOGY, ANGUCHETTYPALAYAM.

CASH PAYMENT VOUCHER

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Financial Support for the staff to Present papers in 6th National conference On Research and development in scienie Engineering and Technology (NCRDSET 22) on 27.05.2022	20,250	00
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Design and Implementation of Microcontroller Based vehicular Smart Helmet for Safe Journey using sensors

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Abstract

A smart helmet is a special idea which makes motorcycle driving safer than before. This is implemented using GSM and GPS technology. Many times we hear the cases of bikes getting stolen from parking area or sometimes we forgot to remove the keys from bike by mistake. In these cases it is really difficult to get the bike back. This project is designed to solve this purpose. Main concept behind this project is of a bike security system using a password entered through keypad. This system turns on the Buzzer when wrong password is entered for 3 times. User can change this password anytime he/she wish using a keypad. If the rider wears the helmet then only the bike will be turn on. The working of this smart helmet is very simple, vibration sensors are placed in different places of helmet where the probability of hitting is more which are connected to microcontroller board. So when the rider crashes and the helmet hit the ground, these sensors sense and gives to the microcontroller board, then controller extract GPS data using the GPS[8] module that is interfaced to it. When the data exceeds minimum stress limit then GSM module automatically sends message to ambulance or family member. The RF is used for start the two wheeler firstly it checks whether the driver is drunk end or not if drunken it will not allow to start two wheelers. Here a circuit which detects when a call is incoming in a mobile phone by means of a flashing LED. It can detect even when the calling mobile phone and the engine is automatically turn off.

Keywords: Alcohol Sensor, GSM, GPS, Microcontroller, Pressure Sensor, Smart helmet, Vibration Sensor

1. Introduction

The thought of developing this project comes to do some good things towards the society. Day by day the two wheeler accidents are increasing and leads to loss of many lives[6]. Accord to a survey of India there are around 698 accidents occurring due to bike crashes per year. The reasons may be many such as no proper driving knowledge, no fitness of the bike, fast riding of bike, drunken and drive etc[14]. Sometime the person injured, the accident may not be directly re possible for the accident, it may be fault of rider, but end of the day it's both the drivers involved in the accidents who is going to suffer[12]. If accidents are one issue, lack of treatment in proper time is another reason for deaths. According to the survey India 698 accidents occur per year, nearly half the injured people die due to lack of treatment in proper time. The many reasons for this such as late arrival of ambulance, no persons at place where the accident occur to give information to the ambulance or parents.This is a situation we observe our day to day life, a thought of finding some solution to resolve this problem come up with this idea of giving the information about accident as soon as possible and in TIME....!!!! Because after all time matter is a lot, if everything is done in time, at least we can save half the lives that are lost due to bike accidents. Considering three major factors for avoiding the accident causes such as I. Make wearing the helmet compulsory. II. Avoid drunk and drive. III. If person met with an accident, no one is there to help him. Simply leaving or ignoring the person he may die. In such situation, informing to ambulance or family members through mobile to rescue him for an extent. The idea of this work is to give information about the rider wearing the helmet or not, whether the rider drunken or not and also, he met with an accident it gives an information about location where he is met with an accident through GSM module to mobile numbers family members, so I have chosen GSM technology to give the information by sending SMS, using GSM module which has SIM card slot to place the SIM and send SMS[8]. Sending SMS alone can't help the driver, if we send and an SMS saying that accident had occurred where the ambulance will come without knowing the location of the accident. So to trace out the location where exactly accident occur using GPS module, and gives to microcontroller, then it sends the SMS which contains the latitude and longitude of an area to family members mobile numbers For this we use GPS module to extract the location of the accident, the GPS data will contain the latitude and longitude values using which we can find the accurate position of the accident place[16].

High Speed Gate Level Synchronous Full Adder Designs

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Assistant Professor[1 2 3], Department of ECE, St. Anne's College of Engineering and Technology, Panruti

Abstract

Addition forms the basis of digital computer systems. Three novel gate level full adder designs, based on the elements of a standard cell library are presented in this work: one design involving XNOR and multiplexer gates (XNM), another design utilizing XNOR, AND, Inverter, multiplexer and complex gates (XNAIMC) and the third design incorporating XOR, AND and complex gates (XAC). Comparisons have been performed with many other existing gate level full adder realizations. Based on extensive simulations with a 32-bit carry-ripple adder implementation; targeting three process, voltage and temperature (PVT) corners of the high speed (low Vt) 65nm STMicroelectronics CMOS process, it was found that the XAC based full adder is found to be delay efficient compared to all its gate level counterparts, even in comparison with the full adder cell available in the library. The XNM based full adder is found to be area efficient, while the XNAIMC based full adder offers a slight compromise with respect to speed and area over the other two proposed adders. Key-Words: - Combinational logic, Full adder, High performance, Standard cells, and Deep submicron design.

1. Introduction

A binary full adder is often found in the critical path of microprocessor and digital signal processor data paths, as they are fundamental to almost all arithmetic operations. It is the core module used for many essential operations like multiplication, division and addresses computation for cache or memory accesses and is usually present in the arithmetic logic unit and floating point units. Hence, their speed optimization carries significant potential for high performance applications. A 1-bit full adder module basically comprises of three input bits (say, a, b and cin) and produces two outputs (say, sum and cout), where 'sum' refers to the summation of the two input bits, 'a' and 'b', and cin is the carry input to this stage from a preceding stage. The overflow carry output from this stage is labeled as 'cout'. Many efficient full custom transistor level solutions for full adder functionality have been proposed in the literature [1] – [10], optimizing any or all of the design metrics viz. speed, power and area. In this paper, our primary focus is on realizing high performance full adder functionality using readily available off-the-shelf components of a standard cell library [11]. Hence, our approach is semi-custom rather than being full custom.

This article primarily focuses on the novel design of full adders at the logic level and also highlights a comparison with many other existing gate level solutions, from performance and area perspectives. The inferences from this work may be used for further improvement of full adder designs at the transistor level. Apart from this, this article is also intended to provide pedagogical value addition. The remaining part of this paper is organized as follows. Section 2 describes the various existing gate level realizations of a 1-bit binary full adder. The three newly proposed full adder designs are mentioned in section 3. Section 4 gives details about the simulation mechanism and results obtained. Finally, we conclude in the next section.

2.Library's full adder cell

The internal details of the full adder cell, whichforms a part of the commercial library [11], could
not be commented upon in this article and so onlythe block schematic of the same is given below in fig. 9. The inputs and outputs are listed therein.

IoT- Based intelligent aquaculture monitoring system for fish farming

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ABSTRACT

As current human Population is 7.7 billion and growing day by day hence food demand is also increasing accordingly. Fish is a rich source of vitamins, minerals, protein, nutrients and micronutrients. It is an important part of consumer's diet especially in poor and underdeveloped countries. It is a big challenge for farmer to fulfill market demand with healthy sea food. Aquaculture is a tool to fill gap between of sea food supply and demand. Use of controlled environment production of aquaculture has been increased to a significant level but losses huge due to manual equipment and management failure. Farmers need real time and accurate information to monitor and maximize production potential. Farmers are using traditional techniques and procedures for the aquaculture. By following traditional approach, farmer measure and monitors the water quality, water level, oxygen level and stress level of the aquaculture manually. In this study, we proposed an Internet of Things (IoT) based smart aquaculture model that will measure water quality (pH, water level, temperature, turbidity and motion detection of fish) for aquaculture. In this work uses low cost and short range wireless sensors network module to monitor and control aquaculture in real-time. Water recycling mechanism also proposed to reduce the amount of aquatic waste materials. By using this system parameters of water are monitored continuously using a serial port which reduces internet consumption, transmitted data regularly with small latency with error free and ensures survival of aquatic life also ensures the quality of growth and increases the economic benefits of aquaculture. The system also detects the movements of fish in the pond.

Keywords: Aquaculture, Internet of things (IoT), PH, Turbidity, Water quality Monitoring,

1.INTRODUCTION

Aquaculture also called aqua-farming, breeding, raising, harvesting of fish, seaweed, algae and many other organisms. It is also defined as breeding species which develop in the aquatic environment under controlled conditions. Aquaculture is one of most reliable and low environment impact process producing high quality protein for humans. This process is more efficient than other forms of agriculture because of higher food convergence. Aquaculture has become famous all over the world. Farmer faces a lot of problems like water rescores, manualtesting of water, sudden climate change, no government interest etc. Unlike daily monitoring of aquaculture behavior and health of thousand individual manually testing is very difficult. Some other problems like inappropriate management technique, water quality, improper record keeping, poor site selection. Traditional water quality monitoring cannot change the dynamic of aquaculture water quality monitoring and also achieved a fixed point monitoring. The aqua farmer presently in depend on manual testing for water parameters. This leads in increase the death rate of fish, decrease the growth rate of the fish, and one of major drawback is more time consumption. Fish pond operators face the challenge of constant monitoring of the water and water changing in such a way that quality is compromised. The model proposed in this work will assist the fish farmers in monitoring fish ponds using IoT. Integrating sensor and internet technology in combination with a user-

CASCADE ATTENTIVE REFINENET FOR BLOOD VESSELS SEGMENTATION OF DIABETIC RETINOPATHY

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P. Ravichandiran,(Electronics and Communication Engineering,,st.annes collegs of engineering and technology
Mrs.D.Umamageshwari,,Electronics and Communication Engineering, st.annes collegs of engineering and
,technology

Abstract

Diabetic retinopathy is the leading cause of blindness in working population. Blood vessel segmentation from fundus images helps ophthalmologists accurately diagnose and early detection of diabetic retinopathy. However, the task of Blood vessels segmentation is full of challenges due to the complex structure, the various sizes and the interclass similarity with other fundus tissues. To address the issue, this paper proposes a cascade attentive RefineNet (CARNet) for automatic and accurate Blood vessel segmentation of diabetic retinopathy. It can make full use of the fine local details and coarse global information from the fundus image. CARNet is composed of global image encoder, local image encoder and attention refinement decoder. We take the whole image and the patch image as the dual input, and feed them to ResNet50 and ResNet101, respectively, for down sampling to extract Blood vessel features. The high-level refinement decoder uses dual attention mechanism to integrate the same-level features in the two encoders with the output of the low-level attention refinement module for Multiscale information fusion, which focus the model on the Blood vessel area to generate accurate predictions. We evaluated the segmentation performance of the proposed Kaggle and DDR data sets. Extensive comparison experiments and ablation studies on various data sets demonstrate the proposed framework outperforms the state-of-the-art approaches and has better accuracy and robustness.

Keywords · Diabetic retinopathy · Blood vessels segmentation RefineNet · Attention fusion

1. INTRODUCTION

Early diagnosis is crucial in many sight-threatening diseases like glaucoma, hypertension and diabetic retinopathy which cause blindness among working age people [1], [2]. Therefore retinal image analysis has become one major diagnosis method in modern ophthalmology. Retinal image analysis typically involves in blood vessel segmentation, optical disc segmentation and fovea segmentation for detecting and analyzing any abnormalities [3], [4]. The contrast enhancement is one mandatory step in any of the related image analysis approaches [1]–[6]. The main challenge of any contrast enhancement algorithm is finding a method to regulate the amplification according to the illumination variations over the image [7]. A typical solution is applying a homomorphism filter to normalize the illumination. However, some contrast enhancement techniques such as contrast limited adaptive histogram equalization (CLAHE) [8] and local normalization (LN)[9] have the capability of analyzing the local illumination and regulate the amplification to bring the final outcome up to an acceptable level of quality. CLAHE is able to handle the illumination variation by doing local histogram equalization and also can regulate the amplification of the details. However, it introduces a box-shaped artifact which may cause to suppress some details and also it amplifies some undesirable details.

Microfluidic Syringe Pump

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Dr. S. Anita,Assoc.prof., Department of ECE, St. Anne's College of Engineering and Technology, Panruti.

Abstract

Syringe pumps are widely used in microfluidics research since they are easy to use and enable fast setup of microfluidic experiments. A syringe pump is a small positive displacement pump used to gradually dose precise amounts of fluid for use in chemical and biomedical research. The key issue is how to make the flow of the syringe pump with very high accuracy and precision. The syringe pump has a stepper motor that drives the lead screw, which in turn moves the pusher block where the syringe plunger is fixed. The stepper motor drives the piston with a desired flow rate, it is controlled by the micro controller and the user interface collects the input data such as volume of drug and infusing time, depending on that flow rate is calculated. The microcontroller ESP32 that interfaces input and output components which controls the syringe pump.

Keywords: *syringe pump, microfluidics, micro controller, and stepper motor*

1 Introduction

In several international studies it was verified that the infusion techniques are a technology with underestimated risks due to several influence factors, namely the use of very small flow (300 ml/min) in premature babies, multi pump administration with the use of several administration lines and the individual variables of the different drugs. At present, microfluidic syringe pump system are needed in the medical, sensor industries and in research purpose. The microfluidic syringe pump will be used in the area where accuracy and precision are very important. Traceability and conformity of measurements are needed to improve the measuring instrument so that it meets the specifications and supports the quality system in the industry or other fields related to the tool [1]. Error and uncertainty associated with the measurement of flow-rate depending on the conditions of the infusion pump and the type of components used. The gravimetric method commonly used for standard calibration in laboratories [2].

Based on the design that has been made, to reduce errors and uncertainties of the components, Lead screw with spring coupler is used for the mechanical efficiency. The springe coupler creates a smooth gliding surface for the screw, thereby reducing friction and lead screw that transform rotary or turning movements into linear movements. The motor that used this microfluidic syringe pump system has been designed and made using a stepper motor as an actuator to drive the lead screw. Because the linear thread used to move the needle has a width pitch, the clock must be divided so that the speed is appropriate. Motor speed adjustment is done by dividing the hours that will be sent to the motor. Therefore, the DRV8825 micro stepping motor driver is used. It is designed to operate bipolar stepper motors in full-, half-, quarter-, eighth-, sixteenth- and thirty second-step modes, with an output drive capacity of up to 45 V and ±2.2 A [3].

2 Requirements and Specification

The syringe pump should be programmable, user friendly, safe use and should have battery backup and comprehensive alarm system. Self-test the device when it is powered on. This power-on self-test includes tests of all critical processors, circuit circuitry, indicators, displays and alarm functionality, the simple monitoring of current through light-emitting diodes (LEDs) as they are turned on and off. If currents fall outside the acceptable range, a fault is indicated. The rate of injection depends on the syringe diameter and the adjusted flow rate of the pump. High or even low injection dosages of a specific drug can be dangerous for living cells. Plastic syringes manufactured by different companies are not identical; therefore, pumps are adjustable to work with different syringe models. Universal clamp is used for all types of syringe models to fit. The DRV8825 Stepper motor driver makes interfacing with a microcontroller super easy as you only need two pins to control both the speed and the direction of the stepper motor.

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SMART RATION SYSTEM USING FACE RECOGNITION

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Mr.P.Saravanabhava,,CSE, St.Anne's CET

Abstract

Ration card plays a vital role for the household details such as to get gas connection, family member details. Technique and IOT to thwart the derelictions and corruption in the current ration distribution system. In this system conventional quota card will be replaced by a Face Recognition system. This Faces will be verified with family members for authentication of the user. If user is found to be authentic then monthly quota of the ration available for the user is displayed. After successful transaction the database will be updated stating the ration content delivered to the user. This system will require very less human efforts for operation and is also very secure. By implementing this system government can keep track of all the delivered ration content very easily.

Keywords: *Face Detection, Face Recognition, Capture Face.*

1 INTRODUCTION

Distribution of ration in a country like India is not an easy task. India is second largest populated country in the world. Public distribution system is a major public sector which manages and distributes the essential commodities to all the citizens of the India below the poverty line and some reserved categories such as police and military persons. In ration shop, materials such as rice, wheat, sugar, dales, kerosene, and oil are provided.

2 EXISTING SYSTEM

In our current ration distribution system of India there are many limitations and malpractice at various levels, which needs to be improved. Furthermost of the helping shopkeepers keep fake allotment greetings card with them. Due en route for fake ration cards, the dealer receives the extra helping from higher govt.

3 DISADVANTAGES OF EXISTING SYSTEM

Due to fake ration cards, the dealer receives the extra ration from higher govt. authority and he sales it into the open market at higher price to earn some extra profit. The quantity of ration that is being allocated might differ significantly from the actual allocated ration quota.

4 PROPOSED SYSTEM

The Smart ration card system uses Face Recognition. This system successfully eliminates the errors due to manual monitoring of ration data as all the data is automatically updated in the cloud based database. To access the database and authentication of user requires internet connectivity which can be a problem in remote locations.

Online Product Price and Comparison Using Web Mining and Machine Learning

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Abstract

Web mining is an application data-mining technique used to extract information from web services. E-commerce websites nowadays have become one of the most important sources for buying all kinds of products. Many strategies have been developed by analyzing customer's behavior so as to attract more business and participation of people. As there are many e-commerce websites available it becomes difficult for users to choose best deal for desired product amongst these websites. Comparison of E-commerce products using web mining enables users to analyze prices and get desired product at minimum price. Users can also select multiple products that belong to same category for comparing its features. In order to make our system dynamic and to keep pace with real-time changes occurring on the sites, our database is automatically updated in every 12 hours. Our system displays the result with 93.06% accuracy according to the user's query. To obtain best deals from e-commerce websites web crawlers and web scrapping techniques are used to fetch detailed information. This way, project aims to provide solution for online customers to buy products at good deal and save their valuable time, effort and money.

Keywords:Price Comparison, Web Crawling, Web Scapping, MangoDB, Django.

1 Introduction

Nowadays, e-commerce websites have been prevalent and growing up in an unprecedented manner. In the current era of online business, ecommerce have become a huge market for the people to buy goods online. E-commerce website holders are deliberately putting prices on their websites derailed from actual rates leveraging on people's demand. Increasing use of smart devices and other mediums has paved the way for users to buy products almost from anywhere. Thus people are being deceived, paying more money than necessary to buy a product. Synthesizing the fact above, the importance of the price comparison tool is beyond gainsaying. This has increased involvement of online buyers evolving e-commerce business.

Our Solution aims for a collaborative platform for allowing a consumer to evaluate the price and make the purchase decision more manageable according to their budget. These large numbers of ecommerce websites put users in turmoil to search and choose to buy a single product from multiple ecommerce websites . They designed a tool for price comparison which uses scrapping scripts written with a python library and improvise the storage for scrapped data. formulated a pattern analysis recommender system by analyzing buying patterns using data mining technique. established a website with Django framework and Mongo DB for comparing price using web crawling and also used request and BeautifulSoup4 library for web scrapped.

We have designed User Interface for a user-friendly interaction while searching for query and for showing results appertaining to correspondent query. This paper is organized as follows: In section , we describe the proposed system and step by step explanations of our work and algorithm. The paper illustrates the experimental result and performance analysis in section , while section encompasses the paper with limitation of our system and plan for future work. .The proposed solution helps online users to grab best deal for their product from multiple ecommerce websites on single web interface

2 Proposed System

To obtain best deals from e-commerce websites web crawlers and web scrapping techniques are used to fetch detailed information. This way, paper aims to provide solution for online customers to buy products at good deal and save their valuable time, effort and money. The proposed system is as follows: The backend system consists of two important techniques web crawling and web scrapping. Web scrapping is a technique that is used to extract information in the human readable format and display it on destination terminal. In this section, we have demonstrated different aspects and the procedure of implementation of our price comparison tool. Algorithm 1 demonstrates the pseudo code for the creation of the database where Algorithm 2 represents the pseudo code for the language processing and comparison methods.

CYBERBULLYING DETECTION ON SOCIAL NETWORKS USING NEURAL NETWORKS.

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Abstract

Online users now share their information with each other easily using by communication, collaboration, knowledge and ideas. However, this has led to the growth of cyber criminal acts, for example, cyberbullying which has become a worldwide epidemic. Cyberbullying is the use of electronic communication to bully a person by sending harmful messages using social media, instant messaging, or digital messages. It has emerged as a platform for insulting and humiliating a person which can affect the person either physically or emotionally and sometimes lead to suicidal attempts in the worst case. The main issue in preventing cyberbullying is detecting its occurrence so that appropriate action can be taken at the initial stages.These social technologies have created arevolution in user-generated information,online human networks,and rich human behaviour-related data. However, the misuse of social techonogies such as social media platforms has introducted a new form of aggression and violence that occurs in online To overcome this problem, many methods and techniques had been worked upon till now to control this problem. Cyberbullying is the use of electronic communication to bully a person by sending harmful messages using social media, instant messaging, or digital messages. It has emerged as a platform for insulting and humiliating a person which can affect the person either physically or emotionally and sometimes lead to suicidal attempts in the worst case. The main issue in preventing cyberbullying is detecting its occurrence so that appropriate action can be taken at the initial stages. To overcome this problem, many methods and techniques had been worked upon till now to control this problem.

INDEX TERMS: Cyberbullying, Cybercriminals Online users and communicators.

1 Introduction

Online communication is how people communicate, connect, transact to send, retrieve, or receive information of any kind via the internet using digital media. All the communication that is carried out via the internet is known as Online communication. Because of our increasing presence online, this type of communication is becoming equally important as offline communication. More and more information is being churned out online ever than before. There is a lot of information for the reader to read online. People have started doing everything online, including but not limited to banking, reserving tickets, booking travel, planning travel, purchasing any and every kind of thing, teaching, conducting meetings and seminars, one on one or group discussions, dating, sending information. Every other activity which is possible is being done online. While basic tech literacy is essential for online activities, many can perform activities even with very little knowledge. The growth of online communication is fast and rapidly replacing traditional communication methods. Paper-based communication has reduced a lot since the evolution of online communication. It is convenient, easy, and does not cause any harm to nature. It is also fast and can be communicated anywhere in the world.

1.1 Cybers talking:

Cybers talking is a form of online harassment in which the perpetrator uses electronic communications to stalk a victim. This is considered more dangerous than other forms of cyberbullying because it generally involves a credible threat to the victim's safety. Cybers talkers may send repeated messages intended to threaten or harass, and they may encourage others to do the same, either explicitly or by impersonating their victim and asking others to contact them..

1.1.1 Trolling:

Internet trolls intentionally try to provoke or offend others in order to elicit a reaction. Trolls and cyberbullies do not always have the same goals: while some trolls engage in cyberbullying, others may be engaged in comparatively harmless mischief. A troll may be disruptive either for their own amusement or because they are genuinely a combative person.

DL-CNN BASED HARDWARE STATE ENABLED USING HAND GESTURE

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Abstract

Gesture recognition is a technology that is becoming increasingly relevant, given the recent growth and popularity of Virtual and Augmented Reality technologies. It is one key aspect to HCI, allowing for two-way interaction in virtual spaces. However, many instances of such interaction are currently limited to specialized uses or more expensive devices such as the Kinect and the Oculus Rift. In this paper we explore the methods for hand gesture recognition using a more common device the mobile Hand camera. Specifically, we explore and test 3 different methods of segmenting the hand, and document the pros and cons of each method. We will also cover one method for hand gesture recognition.

Keywords: convolutional neural network, IoT devices, anomaly detection; UAV videos; deep Learning.

1 Introduction

Hand gesture recognition is the first step for a computer to understand human body language. It plays a pivotal role in a wide range of human-computer interaction (HCI) applications such as smart mobile and TV control, video games, telesurgery, and virtual reality applications of hand gesture recognition.The hand gestures involved in sign language are structured in a very complex way as they convey important human communication information and feelings the time dependence of these frames makes it difficult to directly compare the primitives in Euclidean space. Most of the existing recognition systems only consider the local configuration of the hand.These systems either receive a segmented hand region as input or perform a hand segmentation preprocessing step using skin color models or colored gloves.However, such systems perform well only for gestures involving simple alphabets and numbers, which slightly rely on the global configuration, but not for real sign language gestures. Traditionally, dynamic hand gesture recognition systems use different techniques to extract handcrafted features followed by a sequence modeling technique such as a hidden Markov model(HMM). However, the recent success of deep learning techniques in image classication, object recognition, speech recognition, and human activity recognition has encouraged many researchers to exploit them for hand gesture recognition. For example, convolutional neural networks (CNN) have been widely used for learning visual features in computer vision. The most important characteristic of 3DCNN is its ability to directly create hierarchical representations of spatiotemporal data. However, it requires more parameters than 2DCNN, which is one of its disadvantages. Moreover, 3DCNN has an additional kernel dimension, which makes it harder to train. Hence, instead of training a 3DCNN from scratch, using domain adaptation on pretrained instances is preferred.

2 Related Works

S. Kausar and M. Y. [1] Javed presented a paper on the survey of the current research trends in the field of SL recognition to highlight the current status of different research aspects of the area. Paper also critically analyzed the current research to identify the problem areas and challenges faced by the researchers. This identification is aimed at providing guideline for the future advances in the field. M. B. Waldron and S. Kim [2] presented a paper on design and evaluation of a two-stage neural network which can recognize isolated ASL signs is given. The input to this network is the hand shape and position data obtained from a DataGlove mounted with a Polhemus sensor. The first level consists of four backpropagation neural networks which can recognize the sign language phonology, namely, the 36 hand shapes, 10 locations, 11 orientations, and 11 hand movements.

VIDEO COMPRESSION

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Abstract

Data Compression is a technique of reducing the amount of space data occupies, to ease the process of storage and communication. The fundamental process of compression involves using a well drafted technique to convert the actual data into the compressed data (smaller size). Depending upon how well a compression technique works and how much data can be regenerated from the compressed data given by a certain technique, the technique is classified as either as a lossy data compression technique or lossless data compression technique. Compression is the process of modifying, encoding or converting the bits structure of data in such a way that it consumes less space on storage disk. It enhances reducing the storage size of one or more data instances or elements. The technique of data compression can save storage capacity, speed up file transfer, and decrease costs for storage hardware and network bandwidth. The Compression techniques enables sending a data object or file quickly over a network or the Internet and in optimizing physical storage resources. Different methodologies have been defined for this purpose. There is a complete range of different data compression techniques available both online and offline working such that it becomes really difficult to choose which technique serves the best. A data compression algorithm developed in this article consumes less time while provides more compression ratio as compared to existing techniques. In this paper we represent a MPEG compression algorithm to compress the video files.

Keywords: *lossless compression,lossy compression,storage,MPEG.*

1 Introduction

The video data compression has wide implementation in computing services and solutions, specifically data communications. The video data compression works through several compressing techniques and software solutions that utilize data compression algorithms to reduce the data size. Data compression technique, also called compaction, the process of reducing the amount of data needed for the storage or transmission of a given piece of information, typically by the use of encoding techniques. Today, data compression is important in storing information digitally on computer disks and in transmitting it over communications networks.

Also compressed files are much more easily exchanged over the internet since they upload and download much faster. We require the ability to reconstitute the original file from the compressed version at any time. Data compression is a method of encoding rules that allows substantial reduction in the total number of bits to store or transmit a file.

Compression technologies have been an enabler for the broadcast industry starting with the analogue television. Ever-increasing data from image and video capture require methods and techniques to reduce the amount of data to be transported or stored. Nearly over the last four decades MPEG Motion Pictures Expert Group - developed MPEG-1, MPEG-2, MPEG-4 and MPEG-H video compression standards. A given codec standard is developed with contribution from many researchers over a considerable time. ISO/MPEG and ITU have harmonised and standardised them. The following sections discuss briefly the process, advancements, trends and challenges.

For video coding standards, the core problem has remained the same over the years: reduce the size of stored or transmitted video data as much as possible while keeping the visual quality as close as possible to the original video. The convention when it comes to video coding standards has been to only define the bitstream format (syntax) and the decoder but not the encoder. This allows for cross-industry compatibility of the most critical component i.e. the decoder and at the same time. It allows for innovation and flexibility in the design of the encoding process, for example, meeting requirements of latency and availability of computational resources.

Heart Attack Prediction For Stroke Patients Using Machine Learning

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Abstract

Early predicting heart attack out of stroke patients in a view of data analysis is an approach to reduce a high mortality rate. Stroke-patient data in Intensive Care Unit are imbalanced due to that stroke patients with heart attack are in the minority of stroke patients. How to predict heart attack in the stroke-patient data becomes a challenge. For processing the imbalanced data, this paper designs an algorithm by leveraging Linear regression. Linear Regression is a machine learning algorithm based on supervised learning. It performs a regression task. Regression models a target prediction value based on independent variables . Our results show that classifier achieves the best Predicting performance with accuracy of 80.30%, precision of 80.05%. It could be well-predicted using Linear regression that whether a stroke patient will have heart attack or not.

Keywords: stroke, heart attack, Linear regression, imbalanced data, variable.

1 Introduction

Stroke, also known as ''ischemic stroke'', refers to ischemic necrosis or softening of localized brain tissue caused by cerebral blood supply, ischemia and hypoxia. The main clinical manifestations are sudden collapse, mental coma, unclear speech, and hemiplegia . Heart attack is a myocardial necrosis caused by acute and persistent ischemia and hypoxia of coronary artery which manifestations are arrhythmia, shock or heart failure, which can be fatal . Stroke complicated with heart attack is cerebral infarction accompanied by heart attack. As we know, the stroke complicated by heart attack was 30%, and the mortality rate was as high as 54%. The main causes of death are ventricular arrhythmia, acute left heart failure and cardiogenic shock. . On the other side, the onset of heart attack is rapid, and sudden deaths easily happen on the heart attack patients. This paper attempts to predict heart attack for the stroke patients based on analyzing medical indication. Such a prediction is to gain more treatment time for the stroke patients with heart attack.

1.1 Factors Of Stroke

- High blood pressure
- Cigarette smoking or second hand smoke exposure
- High cholesterol
- Diabetes
- Obstructive sleep apnea
- Cardiovascular disease, including heart failure, heart defects, heart infection or irregular heart rhythm, such as atrial fibrillation.
- Personal or family history of stroke, heart attack or transient ischemic attack
- COVID-19 infection

1.2 Symptoms

- Trouble speaking and understanding what others are saying.
- Paralysis or numbness of the face, arm or leg. Problems seeing in one or both eyes.
- Headache.
- Trouble walking .
- sudden behavioral changes, especially increased agitation.

2 Attributes

2 a.Demographic:

•Sex: male or female(Nominal)

OPTIMIZATION OF MACHINING PARAMETER ON SS316L MATERIAL USING ORTHOGONAL ARRAY METHOD

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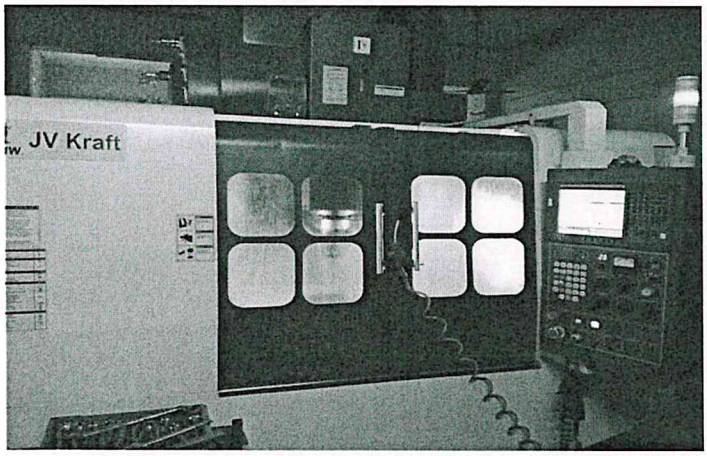
ABSTRACT

In this paper, Taguchi techniques are applied to find out the surface roughness, metal removal rate, machinability in milling operation of SS316L. L9 orthogonal array, S/N ratios and ANOVA are used to study the performance characteristics of cutting speed, feed rate and depth of cut as milling parameters with tool flank wear width as response variable. The result of the analysis show that the selected machining parameters affect significantly the tool flank wear width of Tungsten Carbide cutting tool while machining SS316L.And also indicate that the cutting speed is the most influencing parameter out of the three parameters under study. Finally, the results are further confirmed by validation experiments or confirmation run.

***Keywords**: Taguchi Method, Optimization, Tool flank wear width, S/N ratio.*

Introduction

Taguchi method stresses the importance of studying the response variation using the resulting in minimization of quality characteristic variation due to uncontrollable parameter. The metal removal rate was considered as the quality characteristic with the concept of larger better.



The EN8 steel of is mounted on the JV KRAFT vertical milling machine tool and specimens of 10mmx50mmx100mm size are cut.

2 Experimentation

The 12 mm tool was fixed with the help of jaw block in machine. The program was made for cutting operation of the work piece and a profile of 12 mm x 100mm horizontal cut. Each set of experiments was performed at room temperature in a narrow temperature range

EXPERIMENTAL ANALYSIS OF DIESEL ENGINE USING BIO-FUEL BLENDED WITH ALUMINIUM OXIDE

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ABSTRACT

Petroleum products such as petrol and diesels are being used as a fuel to the running of Internal Combustion Engines. Day by day demands for the petroleum products is increasing since its rate of consumption is increasing

INTRODUCTION

Petroleum based fuels plays a conventional energy sources along with increasing demand and also major contributors of air pollutants. The petroleum fuels fulfil energy needs in industrial development, transportation, agriculture sector and other basic requirements. Need alternative fuel for the shortage of fossil fuel The biofuel from the biomass available in large quantity and can be replaced for fossil fuels.The micro algae oil is used as the bio fuel in the direct injection (DI) diesel engine, when the oil extracted by pyrolysis process. An experimental investigation is carried out to analyze the effect of biofuel, the blended fuels to be improving diesel engine performance,emission and properties, where compared to diesel.

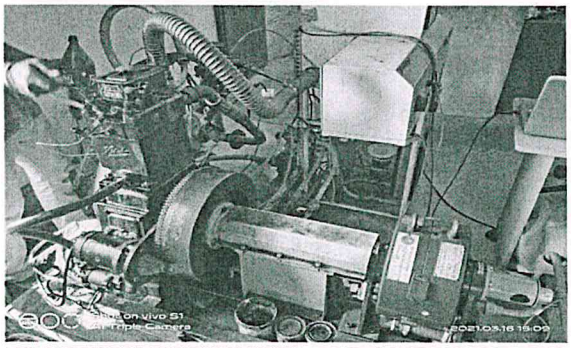
OBJECTIVES

The main objective of our project is,To increase the performance and reduce the emission of diesel engine by using bio fuel, blended with aluminium oxide nano particle where compared to diesel.

ALTERNATIVE FUEL

Alternative fuels known as "Non-conventional" or "Advanced fuels" , are any materials or substances that can be used as fuels, other than conventional fuels like fossil fuels (petroleum oil, coal and natural gas) as well as nuclear materials such as uranium and thorium, as well as artificial radioisotope fuels that are made in nuclear reactors.
Example
Biodiesel, bioalcohol (methanol, ethanol, butanol), hydrogen , non-fossil methane, non-fossil natural gas, vegetable oil, propane, and other biomass sources.

ENGINE TESTING



BLENDING WITH DISEL AND SPIRULINA OIL & ALUMINIUM OXIDE NANOPARTICLES

Electrical Discharge Coating of Aluminum Alloy Using WS_2/Cu Green Compact Electrode

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ABSTRACT

Aluminium (Al) alloys have been one of the most employed materials in defence applications like torpedoes, manufacture of Missile bodies and parts of automobile such as engine cylinders and pistons, due to their lightweight, high mechanical resistance, good corrosion properties and low cost. Poor wear resistance of the alloys is major constraint for their use particularly when aluminum is in contact with other parts. Keeping in view, improving the antifriction properties of Al-7075 alloy, electrical discharge coating (EDC) was attempted to modify the surface of Al alloy with solid lubricant tungsten disulfide (WS_2). Tungsten disulfide (WS_2) and copper (Cu) powder powders were mixed in the ratio of 60:40 and compacted in the hydraulic press to obtain green compact electrodes. Further it has been used as electrode for EDC technique. In the present work, Response surface methodology (RSM) is used to perform the experiment with different parameter combinations such as discharge current, pulse-on time and pulse-off time on the alloyed characteristics of deposition rate (DR) and electrode wear rate (EWR) were studied. It was found that current has significant parameter on DR and pulse on time was found to be predominant in obtaining higher EWR. Micro structural changes during EDC and composition of materials present on the surface were analyzed through SEM and EDS.

Keywords EDC; Powder metallurgy; DR, EWR.

INTRODUCTION

Electro discharge coating (EDC) is an unconventional coating method developed in recent years. It uses an electrical discharge media to build a hard layer on a metallic work piece. EDC can be used to improve the hardness, wear resistance, corrosion resistance and without causing major changes to the bulk workpiece material. Due to its unique properties, such as light weight and high specific strength, aluminum alloy has rapidly increased its acceptance in industrial applications. It has led to the rapid substitution of ferrous metal materials, mainly in the aviation and automotive fields, with improvements in weight, fuel consumption and performance and efficiency. However, the wear resistance of aluminum alloy is very low [1]. Therefore, surface modification has become very important for improving wear resistance and improving the acceptability of aluminum alloys in industrial environments. In the process of EDM, a spark is activated at the point of the smallest gap between the poles through the high voltage of the positive polarity, which exceeds the dielectric breakdown resistance of the small gap. The insulating effect of the dielectric is important to avoid electrolysis of the electrode during the EDM process melting and vaporisation of the workpiece surface is followed by quick cooling/quenching by the dielectric fluid. Mohanty et al. (2018) used electrical discharge machining to examine the surface alloying of Ti6Al4V using tungsten disulphide powder mixed with dielectric. Surface roughness, material removal rate, and micro-hardness were the responses studied, with voltage, duty factor, and powder particle concentration being the processes. The most important factor affecting the decomposition was the powder concentration. The deposition rate, surface roughness, and recast layer thickness were all influenced by powder concentration[2]. Elaiyarasan et al.(2020) examined the ZE41A magnesium alloy, which was deposited using an electrical discharge coating process with a WC-Cu powder metallurgy semi-sintered and sintered electrode. At low compaction loaded partial sintered electrodes, it was revealed that the maximum material migration rate and micro hardness increased as the current and pulse on time increased[3]. Senthil Kumar and Ganesan(2015) used a WC-5

Analysis of Mechanical Properties of TiC Reinforced Aluminium Alloy Composites

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Abstract

In the present paper, the aluminium alloy i.e. AA 6061-T6 based composites reinforced with different weight fraction of TiC(2-3μm) particles (0%, 10%, 15% and 20%) was produced by stir cast technique and the effect of reinforced ratios on the mechanical properties and Tribological behaviour was examined. The test results shows that the increment in weight fraction of reinforcement particles in the matrix metal produced better mechanical properties like hardness, Tensile strength, Impact strength. SEM metallographic images and EDAX analysis evidences the homogenous dispersion of reinforcement in the matrix. The dry sliding wear behaviour shows that wear rate of the casted samples has decreased with the amount of reinforcement added. For the same working conditions wear rate increases with increasing load and with increasing speed.

Keywords: *Metal Matrix Composites, AA 6061-T6-TiC, Mechanical properties, Tribological behaviour, Reinforcement*

1. INTRODUCTION

Metal matrix composite (MMC) is engineered combination of the metal (Matrix) and hard [particle/ceramic (Reinforcement) to get tailored properties. MMC's are either in use or prototyping for the space shuttle, commercial airliners, electronic substrates, bicycles, automobiles, golf clubs, and a variety of other applications. The composites formed out of aluminium alloys are of wide interest owing to their high strength, fracture toughness, wear resistance and stiffness. Metal matrix composites (MMC's) are increasingly becoming attractive materials for advanced aerospace applications because their properties can be tailored through the addition of selected reinforcements [1-2]. In particular, particulate reinforced MMC's have recently found special interest because of their specific strength and specific stiffness at room or elevated temperatures [3].It is well known that the elastic properties of metal matrix composites are strongly influenced by micro structural parameters of the reinforcement such as shape, size, orientation, distribution and volume fraction [4]. A typical chemical composition of Al 6061 is presented in Table I

Table I CHEMICAL COMPOSITION OF AA 6061-T6

Element	Mg	Fe	Si	Cu	Mn	Ti	V	Al
Weight %	1.08	0.17	0.63	0.32	0.52	0.01	0.02	Remainder

In recent years, the aluminium alloy based MMCs have offered designers many added benefits as they are particularly suited for applications requiring good strength at high temperatures, good structural rigidity, dimensional stability, light weight and low thermal expansion [5-10]. The major advantages of Aluminium Matrix composites (AMCs) include greater strength,improved stiffness, reduced density, improved high temperature properties, controlled thermal expansion coefficient, thermal / heat management, enhanced and tailored electrical performance, improved abrasion and wear resistance and improved damping capabilities [11, 12]. Various types and sizes of reinforcements are used in matrix of Aluminium like SiC, TiC, Al2O3, B4C, TiB2, TiN, etc. Among these, TiC is a relatively new reinforcement in metal matrix composites and has good properties such as wettability, thermal stability and distribution in Aluminium metal matrix [13-15]. The Al-TiC MMC samples for microscopic examinations were prepared by adopting standard metallographic procedure.

Samples were polished using different size of TiC grit papers of 120, 220, 400, 600, 800, 1000, and 1200, followed by velvet cloth with aluminium paste. The Keller's reagent was used for etching with mixture of 0.5 ml HF, 0.75 ml HCl, 2.5 ml HNO3 and balance amount of distilled water. The microstructures of the etched sample were examined using Scanning Electron Microscope (SEM) and Compositional test of the sample were carried out using Energy-Dispersive X-ray spectroscopy (EDX)

Taguchi optimization of end milling parameters on 316L stainless steel

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Abstract

Meeting predefined quality requirements, enhancing production efficiency with specialised equipment, and sticking to time and cost restrictions are all part of the overall manufacturing problem. Unfortunately, meeting these requirements for certain of a product's quality qualities is difficult. Surface finish is a significant quality attribute. This research examines the direct impacts of three processing parameters on surface roughness (Ra) in 316L stainless steel end milling. Three parameters were used in the experiments: spindle speed, feed rate, and cut depth. The experimental study was conducted using a Taguchi L9 orthogonal design. The Taguchi analysis was utilised to identify the sensitive parameters that have an impact on surface quality.

Keywords: AISI 316L stainless steel, Surface roughness, Main effect plot, SN ratio plot, Optimization

1. Introduction

In industrial processes, end milling is one of the most popular metal removal operations. It is widely utilised in a range of manufacturing industries, including aerospace and automotive, where the creation of slots, pockets, precision moulds, and dies requires high quality. The surface quality has a considerable impact on milling performance, since a high-quality milledsurface enhances fatigue strength, corrosion resistance, and creep life [1].

Because of its high mechanical qualities, increased stability and withstand resistance to corrosion, and cost-effective manufacture, AISI 316L is most widely used in biomedical applications, aerospace, and marine[2–4]. Furthermore, as compared to other stainless steels, machining AISI 316L is quite difficult. Because it allows for less intensive martensite formation during metal cutting, making traditional techniques of processing easier[5]. The main advantage of these materials is that traditional machining can be done fast and cheaply. AISI 316L is commonly used to make bioimplants. Because the machined component of a bioimplant could attain very fine surface quality. Surface roughness will cause fatigue cracks, which will lead to corrosion[6].

Researchers have developed a number of techniques to reduce surface roughness and increase metal removal rate. Yang et al [7] focussed on improving the surface finish in face milling operation by the concept of Taguchi. The results predicted the best cutting combination for surface roughness and signal-to-noise ratio. Ghani et al [8] described a procedure for optimising the end milling parameters using Taguchi while execute the machining of steel grade AISI H13and the outcomes confirm that higher level cutting speed and lower-level feed rate, and depth of cut were the best combinations for obtaining lower resultant cutting force and attain the excellent surface finish.

Gurbuz et al [9] focused on the surface condition of SS316 L and the impact of machining parameters during machining. The results show that when increase thefeed and the cutting depth, the surface condition deteriorated; but, when cutting speed was increased, the surface integrity improved. Kadi et al [10] observed the dry turning process of AISI 316L for obtaining low surface roughness. The findings show that major impact registered on surface finish was feed rate.

AN OVER VIEW OF BIOMASS DRYER FOR CASHEW PRODUCT

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ABSTRACT

Biomass hybrid dryer is one of the simplest methods used in food and agriculture industries for extracting the moisture contents from the products in less time with good quality of product with and maintain uniform colure. Psychometrically the psychometric is important in drying technology as it refers to the properties of water particle mixture which controls drying rate. The temperature and rate at which the liquid vaporization occurs will depend on the concentration of evaporation in the surrounding atmosphere. Biomass drying refers to drying energy methods.. A biomass dryer is a enclosed unit structure to keep the food protected from harm and to preserve product quality. Different types of biomass dryers are available and are generally known as forced convection and natural convection. Biomass dryer more cost efficient than other dryer types. Through this paper we looked at the development of the biomass dryer's architecture and efficiency review

Keywords— *Biomass dryer, natural draft, forced draft, drying time, moisture.*

1. Introduction.

Biomass is one of the main renewable energy sources which are readily available. The energy source supplies are not limited that why it is called as renewable energy and it has much demand in various parts of the world. It is eagerly focusing for the cost effective method of dryers either forced or natural circulation method commonly used for drying. Dryers are utilizing to dry various agricultural products like crop drying, Space heating and product maintaining good quality even studies a few biomass projects in different parts of the world and discusses future. Biomass techniques are available for drying different food products and which has some advantages and disadvantages. This technique is necessary to preserve the food products. The biomass hybrid dryer is one of the most effective methods which have been implemented. There is a lot of awareness growing in the world that the renewable energy is play vital role with extending technology. The developing countries are in need to improving their productivity hence biomass is much acceptable category as an energy saving method in agricultural applications. It is preferred as one of the best among other alternative energy sources and the technology is very good. The biomass hybrid dryers have various applications. Biomass has some benefits in sustainable terms over fossil fuels such as coal petroleum and gas. It does not produce the pollutants but while burning biomass can release carbon dioxide but it is needed to growing plants that why it is balanced. In this review paper, we have reviewed the design modifications applied and development of different types of hybrid biomass dryers. Biomass dryer is not only environmentally friendly but also benefited to utilize both in urban and rural areas for commercial purpose and much more simple compared to other types of dryers. It provides higher drying temperatures as drying takes place in an enclosed cabinet. EERE information center [1] Biomass is one of the most important sources of renewable energy for transport. Biomass is any biological material that has stored sunlight in the form of chemical energy, such as plants, farm crops or residues, urban waste and algae

Tkemaladze et al [2] Economic and political value 'Biomass Action Plan and Multi-Year Plan,' established by the Energy Department of the European Commission. Chum et al[3] the former paper also reviewed the need to reduce emissions of carbon dioxide and focused on raising awareness by increasing the issue of global warming. Biomass renewable energy resource emitted CO_2 during processes of combustion and consumption occurs and results in an rise in atmospheric carbon dioxide in origin. Vegetables use $CO_2$and Consecution of other plant degradation processes.

1.1Comparative Study of various types of dryers with different parameters

There are various types of dryers based on the fuel are available in general it can be classified as follow

1. Biomass dryer: use wood or waste of agricultural product
2. Solar dryer: sun heat only use
3. Electric dryer: based on power avail

Optimal Placement and Sizing of Distributed Generator Based on Multi Objective Particle Swarm Optimization

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Abstract

To solve the problems of environmental pollution and energy consumption, the development of renewable energy sources becomes the top priority of current energy transformation. Therefore, distributed power generation has received extensive attention from engineers and researchers. However, the output of distributed generation (DG) is generally random and intermittent, which will cause various degrees of impact on the safe and stable operation of power system when connected to different locations, different capacities, and different types of power grids. Thus, the impact of sizing, type, and location needs to be carefully considered when choosing the optimal DG connection scheme to ensure the overall operation safety, stability, reliability, and efficiency of power grid. This work proposes a distinctive objective function that comprehensively considers power loss, voltage profile, pollution emissions, and DG costs, which is then solved by the multi objective particle swarm optimization (MOPSO). Finally, the effectiveness and feasibility of the proposed algorithm are verified based on the IEEE 33 bus and 69-bus distribution network.

1 Introduction

With the rapid development of the world's electric power industry, the total amount of social electricity consumption has risen sharply over the last decade (Yang et al., 2016; Yang et al., 2017; Zhang et al., 2021). Under the traditional grid framework, the power sector mainly builds large centralized power sources such as nuclear power stations, large hydropower stations, and coal-fired power stations and then expands into a large-scale power system (Yang et al., 2019a; Yang et al.,2019b; Yan, 2020). However, its disadvantages are also increasingly prominent (Li et al., 2020; Xi et al., 2020), in particular, highly centralized power supply is gradually difficult to meet the flexibility requirements of power grid operation, and the failure of important power supply nodes seriously affects the overall reliability of power grid's power supply. Moreover, long-distance transmission is also under serious power loss and security problems (Mehleri et al., 2012; Wang et al., 2014; Yang et al., 2018).

To overcome the negative impact of the aforementioned problems, the concept of distributed generation (DG) was put forward in the 1980s (Gopiya Naik et al., 2013; Yang et al., 2015). DG has an extremely important influence on the planning and operation of the distribution network (Sara et al., 2020; Yang et al., 2020; Ali and Mohammad, 2021). Also, proper access of DG in distribution network can effectively enhance the power quality, reduce the active power loss, improve the voltage distribution, and boost the overall economy and flexibility of the power network operation (Abdurrahman et al., 2020; Bikash et al., 2020; Suresh and Edward, 2020). As the end of power network, the stability and efficiency of distribution network directly affect its overall efficiency (Surajit and Parimal, 2018; Bikash et al., 2019). Therefore, the location and sizing of distributed power generation have become an important research content of power grid planning.

The problem of location and sizing of DG is to optimize its installation point and sizing to maximize the benefits under the constraints of satisfying the given investment and system operation (Kumar et al., 2019; Nagaballi and Kale, 2020). With the increasing requirements for power system reliable operation, the problem of DG location and constant sizing has developed from a single-objective problem that only considers the minimum network loss to multi objective optimization problem that comprehensively considers voltage quality, current quality, and environmental factors. Quadratic programming method, genetic algorithm, and other methods have been applied to solve such multi objective location and constant volume problem. These methods all need to set weights to transform the multi objective problem into a single-objective problem for proper solutions (Murty and Kumar, 2015); however, these weights are often difficult to determine in actual operation.

Besides, the solution of a large number of planning models is relatively complicated, while the selection of the algorithm directly affects the choice of planning schemes (Aman et al., 2014; Nezhad Pashaki et al., 2020; Zeng and

Cost Saving on Micro Grid Operation using Grey Wolf Optimization Algorithm

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Abstract

As a result of today's rapid socioeconomic growth and environmental concerns, higher service reliability, better power quality, increased energy efficiency and energy independency, exploring alternative energy resources, especially the renewable ones, has become the fields of interest for many modern societies. In this regard, MG (Micro-Grid) which is comprised of various alternative energy sources can serve as a basic tool to reach the desired objectives while distributing electricity more effectively, economically and securely. In this paper an expert multi-objective AMPSO (Adaptive Modified Particle Swarm Optimization algorithm) is presented for optimal operation of a typical MG with RESs (renewable energy sources) accompanied by a back-up Micro-Turbine/Fuel Cell/Battery hybrid power source to level the power mismatch or to store the surplus of energy when it's needed. The problem is formulated as a nonlinear constraint multi-objective optimization problem to minimize the total operating cost and the net emission simultaneously. To improve the optimization process, a hybrid PSO algorithm based on a CLS (Chaotic Local Search) mechanism and a FSA (Fuzzy Self Adaptive) structure is utilized. The proposed algorithm is tested on a typical MG and its superior performance is compared to those from other evolutionary algorithms such as GA (Genetic Algorithm) and PSO (Particle Swarm Optimization).

1 Introduction

In recent years, the application of alternative energy sources such as wind, biomass, solar, hydro and etc. has become more widespread mainly due to needs for better reliability, higher power quality, more flexibility, less cost and smaller environmental footprints. On the other hand, DGs (Distributed Generations) such as PV (photovoltaics), micro-turbines, fuel cells and storage devices are expected to play an important role in future electricity supply and low carbon economy [1,2]. However, high penetration of DGs into the grid environment will bring new challenges for the safe and efficient power system operation. These challenges can be partially addressed by MG (Micro-Grid) which is defined as an aggregation of DGs, electrical loads and generation interconnected among themselves and with distribution network as well [2e5]. In this regard, the methodologies applied to manage and control the operation of MGs are going through continuous changing in order

MG, in its whole vision, is an exemplar of a macro-grid in which local energy potentials are mutually connected with each other as well as with the L.V utility and make a small-scaled power grid. In such a network, DGs are exploited extensively both in forms of renewable (e.g., wind and solar) and non-conventional (MT (microturbine), fuel cell, diesel generator) resources because these emerging prime movers have lower emission and the potential to have lower cost negating traditional economies of scale [42]. In addition to DGs, storage options are also used widely to offset expensive energy purchases from utility or to store energy during off-peak hours for an anticipated price spike. In a typical MG, DERs generally have different owners handle the autonomous operation of the grid with the help of Local Controllers (mc or MGLC) which are joined with each DER and mcc or MGCC (Micro-Grid Central Controller). Moreover, the CCU (Central Control Unit), which is a part of the MGCC, does the optimization process to achieve a robust and optimal plan of action for the smart operation of the MG. The raw input data to this unit includes the amount of load inside the grid and the powers generated by the nonscheduled DGs typically based on RESs (Renewable Energy Sources) and the output information involves the optimal set points for DGs in terms of suitable ON/OFF states and required active and reactive powers for supplying the load while keeping the node voltages within the range specified by Norm EN 50160 [43].

A 129-level Asymmetrical Cascaded H-Bridge Multilevel Inverter with Reduced Switches and Low THD

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Abstract

The multilevel inverter is a power conversion device which is uses multiple dc sources to provide required alternating current level. It is can be used for medium to high power applications. This paper presents a 129 level asymmetrical cascaded H bridge multilevel inverter with reduced switching components and higher THD. The proposed inverter uses multiple dc sources with voltage ratio 1:1:2:4:8:16:32. The proposed inverter uses voltage reference technique to control the switching components of the topology. The comparative analysis of 129 level ASCHBMLI and conventional inverter topologies have been presented. The main advantages of the proposed topology is lower switching components, lower losses, and lower THD without the need of filter. MATLAB/SIMULINK software is used to perform simulation and analyse the performance of the proposed topology.

Keywords: *Multilevel Inverter (MLI), Asymmetrical Cascaded H Bridge Multilevel Inverter (ASCHBMLI), Cascaded H Bridge (CHB), MATLAB, Total Harmonic Distortion (THD).*

1 Introduction

The basic function of Inverters is to convert DC electricity to AC electricity, for uses in either stand-alone systems or to connect dc source to AC grid. The Multilevel inverters are power electronic method to generate multiple level AC voltages from multiple medium voltage, dc sources. The multilevel inverters were first invented in 1979, as a three level MLI. It gained popularity due its high-power capability and lower THD, lower electromagnetic interference. Due its vast applications, including FACTS drives, VAR control, HVDC, renewable systems etc., MLIs are popular. today more commercial products are based on MLIs. Thus, there is increased efforts in developing multilevel inverters by changing its topology to obtain superior performance, decreased switching losses, lower THD, lower components requirement etc. There are several topologies having distinctive features. Fig.1 shows different multilevel topologies.

The Multilevel inverters are classified into 3 basic types:

A. Diode clamped multilevel inverter

B. Flying capacitor multilevel inverter

C. Cascaded multilevel inverter

The diode-clamped multilevel inverter consists of clamping diode to generate multiple voltage levels through different phases to the capacitors which are connected in series. It requires (n-1) main dc link capacitors and (n-1)(n-2) diodes, where 'n' is number of levels required. Some of the advantages of Diode clamped multilevel inverter are that it has high efficiency for fundamental frequency, it can be used for high voltage back-to-back inter-connection or an adjustable speed drive. However, diode clamped MLI suffers from various limitations.

The maximum output voltage obtained is limited to one half of input DC voltage. The number of diodes required is quadratically equal to number of levels, thus it requires a large number of diodes to generate high number of levels, disturbed charge balance for more than three levels etc.

The Flying capacitor (FC) topology uses a large number of capacitors of equal value. The topology requires a total number of (n-1)(n-1)/2 capacitors per phase and (n-1) main bus capacitors. The main advantage of the Flying capacitor topology is that the phase redundancy is achievable for balancing voltage levels of capacitors. The flying capacitor topology suffers from high switching losses, limited output voltage, requirement of large number of capacitors, complex start-up etc.

The advantages of this topology is modular design which makes the manufacturing of inverter, quicker and cheaper than other alternatives. The Cascaded H-Bridge inverters (CHB) are further classified into two categories. Symmetrical CHBMLI uses dc sources of equal magnitude (1:1:1:1:1:1:1). Hence it requires more dc sources to get higher levels. Asymmetrical CHBMLI uses dc sources of unequal magnitude in the order of (1:1:2:4:8:16:32).

Monitoring the Microgrid using IoT

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Abstract

The current microgrid power management system is undergoing a significant and drastic overhaul. The integration of existing electrical infrastructure with an information and communication network is an inherent and significant need for microgrid classification and operation in this case. Microgrid technology's most important features: 1) Full duplex communication; 2) Advanced metering infrastructure; 3) Renewable and energy resource integration; 4) Distribution automation and complete monitoring, as well as overall power system control. A microgrid's communication infrastructure is made up of several hierarchical communication networks. Microgrid applications can frequently be found in numerous aspects of energy consumption. Because it provides a spontaneous communicational network, the Internet of Things plays a fundamental and crucial role in Microgrid infrastructure. This paper covers the deployment of a comprehensive energy management system for microgrid communication infrastructure based on the Internet of Things (IoT). This paper discusses microgrid operations and controls using the Internet of Things (IoT) architecture. Microgrids make use of IoT-enabled technologies, in conjunction with power grid equipment, which are enabling local networks to provide additional services on top of the essential supply of electricity to local networks that operate in parallel with or independently of the regional grid. Local balancing, internal blockage management, and request for support marketplace or grid operator activities are examples of auxiliary services provided by the microgrid that can add value to each end-user and other true stakeholders. Different technologies, architectures, and applications that use IoT as a key element with the main purpose of preserving and regulating innovative smart microgrids in accordance with modern optimization features and regulations are designed to update and improve efficiency, resiliency, and economics.

1 Introduction

For the US Department of Energy, the Microgrid Exchange Collection, an ad hoc collection of research and deployment specialists, created the following widely recognized definition: "A microgrid is a collection of interconnected loads and distributed energy resources that operate as a single controllable entity in relation to the grid and are contained within well-defined electrical boundaries. A microgrid may connect to the grid and disconnect from it, allowing it to function in grid-connected and island modes [1] Three prerequisites are included in this description: 1) The microgrid's neighborhood can be separated from the rest of the distribution system; 2) The resources linked to a microgrid are managed by one another rather than by remote resources; 3) The microgrid can operate whether or not it is connected to the larger grid. There is no mention of the scale of distributed energy resources or the technologies that will or should be implemented in the definition [2].

For balancing local loads and achieving economic advantages, microgrids have specific control needs and techniques. According to the agreement, microgrid controllers must have the following functional characteristics: Present the micro grid to the utility grid as a single self-contained entity capable of providing frequency control (similar to a synchronous generator system); avoiding power flow exceeding line ratings; regulating voltage and frequency within acceptable bounds during islanding; dispatching resources to ensure energy balance; islanding smoothly; safely reconnecting and resyncing [3].

Microgrids can be regulated in the same way as the main grid, that is, using a three-level hierarchical control system. Primary and secondary frequency and voltage regulation are typically performed by a Microgrid Central Controller (MGCC) that sends explicit instructions to distributed energy resources, or in a decentralized manner, such as CERTS, where each resource responds to local conditions [4].

Furthermore, microgrids typically include a tertiary control layer to enable economic and optimization operations for the microgrids, which is primarily focused on managing battery storage, distributed generation scheduling and dispatch, and managing electricity import and export between the microgrid and thus the utility grid. In two European microgrids, one on the Greek island of Kythnos and the other in the German "Am Steinweq" project, hierarchical control systems that regulate electricity inside a microgrid and mediate exchanges with the main grid are installed using a "multi-agent system" method. Increasingly, microgrid research and development is that concentrates on adding intelligence to optimize operational controls and market participation [5]

Power Loss Reduction and Voltage Profile Improvement Using Optimal Placement of FACTS Devices

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Abstract

The crucial role of an electric power system is to generate sufficient electricity to meet customer demands with an acceptable level of reliability in an economic manner. In recent years, Flexible AC Transmission Systems (FACTS) devices have been widely used to increase power system operation flexibility and controllability to meet this need. This paper presents an application of Differential Evolution (DE) to optimise the allocation of a Thyristor Controlled Series Capacitor (TCSC), a Static Var Compensator (SVC), and Unified Power Flow Controller (UPFC), as example FACTS devices. The objective of the research was to reduce power losses and improve the voltage profile in an IEEE 30-bus test system. The system performance was assessed with and without each FACTS device under different scenarios of load increase at up to 150% of the base case. The results obtained are encouraging in terms of reassessing electrical restructuring.

1 Introduction

Electric power production and distribution companies are constantly looking for new industrial technologies to contribute to improving energy supplies to consumers that can overcome the problems of increased demand for electric power and the disruption of recent fuel price increases. In recent years, many of these companies have increased their interest in the use of FACTS device technologies, which offer an effective way to improve the stability, reliability and capability of electric power transmission systems in traditional networks without the need to establish new transmission lines [1]. FACTS devices make power flow in transmission systems more flexible by controlling the active and reactive power flows in the transmission lines. The flow of electrical energy in AC transmission lines depends on the size of the wire, the line's intrinsic resistance, and the phase angle between the transmitting and receiving ends of the transmission line [2]. However, although the addition of FACTS devices generally improves the performance of electric power transmission networks, it also adds several technological and economic complications in terms of control, maintenance, and costs [3]. Identifying the optimal location and sizing of FACTS devices may, however, help address these issues, and thus a significant amount of research has been conducted to identify the best use of FACTS devices.

In [4], modelling of the best location for the installation of FACTS devices in an electric power transmission network was discussed, while in [5], FACTS devices were added to power systems suffering from congestion due to overloads; in that case, the locations and sizing of the FACTS devices were determined based on those factors considered to be most sensitive based on the nature of the load. In [6], an adaptive genetic algorithm was used to determine the best allocation of various types of FACTS devices, with the aim of that study being to reduce costs by reducing system losses. Researchers in [7] addressed increasing power transmission capacity by applying PSO technology to reducing system losses and improving line voltage, while in [8], the researchers sought to reduce system losses by adding various types of FACTS devices to power transmission systems. it was thus deduced that the economic cost of adding these devices was offset by a reasonable percentage reduction in total energy losses. In [9], the performance of a power transmission system without the use of FACTS devices and with several types of such device was compared. An artificial intelligence technique was used to determine the best location and size for the relevant FACTS devices, which reduced losses and improved the voltage profile; in addition, the economic costs were calculated in each case and compared with those for the system without FACTS devices.

The current work is divided into several parts as follows: in section 2, a brief overview of FACTS technologies and types is presented, while in section 3, the basic principles of the DE improvement method are reviewed. The methodology used in this study is presented in section 4 and the results of the stud are reported in section 5. Finally, these results are discussed in section 6.

A Novel Circuit for Battery Charging and Motor Control of Electric Vehicle

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Abstract

A new method of battery charging and motor controlling of an electric vehicle (EV) is disclosed in this paper. The entire system consists of two major divisions, those are, EV charger and motor controller, which determine the arrangement of the battery, acting as load or source, and the motor that comes into action during the driving mode. Both the charging and motor control can be performed by two separate highly efficient DC-DC converters named as TA converter which is a Buck-Boost by its nature. While charging a battery it is necessary to make the charging process effective. Microcontroller employs to control all parameter of EV in all conditions. When the motor draws over current, the invented circuit will be tripped through the microcontroller. The supply for the charger will be either from the renewable source or rectified output from the grid.

Keywords : *Electric Vehicle, DC-DC Converter, PI &Hysteresis Controller*

1 Introduction

In the current world the technologies and equipment's are improving in a fast-accelerating speed. However, the wasteful emission from these equipment's is a humongous problem towards the society and Environment. Also, nowadays fuel consumption is at its peak. Time will come when the natural resources will be exhausted. Many vehicle manufacturing companies have already started working on hybrid electric vehicles to avoid the foreseeable future to some extent. An EV is a gift to the nature observing the rate of increase in pollution caused due to various human activities. Several new topologies were designed with different gain and variation in voltage range. LUO converter provides complex model with a high gain converter [8]. Some other non-isolated converters such as CUK, SEPIC can provide multiple drawbacks to buck-boost converters and can't provide positive output voltage as well [9, 4]. Maksimovik and Cuk suggested a converter having a gain of $\frac{D^2}{(1-D)^2}$, which is able to operate only in buck mode because of the clamping diodes D1 and D2 [9]. P. N. Ekemezie suggested that Compared to conventional dc-dc converters, two-switch buck-boost converter is more efficient because of low voltage stress across the switches [5]. A transformer less buck-boost converter with a voltage gain square time of conventional Buck-boost converter has been purposed by Shan Miao which has a drawback that it carries negative inductor current [7]. Markel and Simpson addressed with various operational approaches the battery capacity and energy needs for grid powered parallel Hybrid Electric Vehicles (HEVs) [10]. Bauml and Simic developed a sequence of hybrid simulations of electric vehicles using the language of simulation Modelica [11]. Divya and Jacob purposed a possible potential scenario in the sense of power device systems for the battery developments and the electric hybrid vehicles [12]. A two switch non isolated Buck-Boost converter which has a better performance than the conventional Buck-Boost Converter also known as TA converter has been purposed by Tapas Kumar Mohapatra and Asim Kumar Dey [2, 3]

Here the authors are attempting to use an efficient Buck-Boost Converter (BBC) i.e. the TA converter which is a new topology of BBC, for the purpose of charging the batteries and controlling the motor current of an EV, which has a gain $\frac{D^2}{(1-D)^2}$ [1, 2 and 3]. This BBC also provides a positive output voltage and positive inductor current that is not generated by other BBCs. This converter can provide the required output voltage for any range of input voltage variation. As most of the EVs are designed using 12 volt rated batteries and the voltage rating of available

Solar plates fluctuating between 6 to 30 volts, a Buck-boost converter is suitable to use as a charger for the EV batteries. As TA converter overcomes almost all the drawbacks of other buck boost converters and charging the batteries of EV with motor current controller to control the output current to PMDC motor. Hysteresis current control technique is one of the robust control techniques and also provides several benefits as suggested by [6]. So, hysteresis current control is implemented as current control technique. Hardware testing of both the

Wireless Power Transmission System

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Abstract

This wireless power transfer (WPT) system with repeater coils for multiple loads. Every two repeater coils form a repeater unit where one is used to receive power from its preceding unit and other transmits power to subsequent unit. Each load is connected to a repeater unit and multiple loads can be powered with several repeater units. The two coils in the same repeater unit or both bipolar ones, which are placed perpendicularly so that the magnetic coupling between them can be eliminated. In order to obtain independent power control of all the loads, the series –parallel – series (SPS) compensation method is adopted for each repeater unit . With a proper resonant condition proposed in this paper, the constant load current can be obtained for all the loads when neglecting the coils parasitic resistances. Also we utilize the solar power in our project. An experimental setup has been constructed and the effectiveness of the proposed multiload WPT system is validated by the experimental.

Keywords: *wireless power transmission; resonance; efficient power transmission; high frequency; design of winding; coupling factor.*

1 Introduction

In the early 20th century, the great scientist Nikola Tesla dedicated to transport the power without wire. On the other hand, specific embodiments implicated unfortunately large electric fields [1]. Subsequently the wireless power transmission concept has become the most trending topic throughout the world. There are many applications using the wireless power technology. Many sensor networks and cellular networks also use the same principle as of wireless transmission. There are many approaches to adopt this. On the application of wireless power transmission some issues and initiatives are noticed in Japan although specific forum imitated in ordered to concentrate achievements in the new business area [2]. The overview of recent development in this field like Electrodynamic induction, Electrostatic induction and Evanescent wave coupling clearly discussed [3]-[6]. At the same time the review highlighted the merits, demerits and cost. The performance of induction resonance principle compared with inductive coupling principle for wireless transmission systems. After noticing the problems with old techniques a few more new methodologies are invented [7].

In the wireless power transfer system coupled magnetic resonance plays a vital role because it has lot of advantages compared other methods. But its efficiency drastically decreases in the point of distance. To overcome this problem frequency tracking methods introduced [8]. Every method has its own advantages and disadvantages, after analyzing the all approaches one of the researchers introducing the wireless power transfer system based on inductive coupling technology for electric car battery charger. From the experiment they observed that to transfer wireless power resonant inductive coupling method is more efficient as compared to other methods [9]. Author T.Imura introducing maximizing air gap technique with help of electromagnetic induction principle to improve the efficiency. Here they are introducing Neumann formula with equivalent circuits and performance are found to be good [10]-[13].

In this paper, a new high frequency resonant inductive coupling method is proposed. Design of the HFWPT system is to be operated at resonance frequency of 50 kHz. It can be expected that the high frequency resonance coupling will improve the efficiency of transmission allowing one to transmit at lesser frequency which is nearly in a range of few kHz range. The performance of HFWPT is observed satisfactory to maintain the output voltage as required by changing the coupling coefficient.

2 Design of Wireless Power Transmission System

2.1 Designing

This design includes two sections

- Sending end

Design of Efficient Electric Motorcycle Using Brushless DC Motor

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Abstract

Transportation is a tool that human needs from the past until now; it is an essential device in human life. Along with the development of transportation in this world, more and more energy used to come from fossil energy, which is limited, and the number of its availability decreases over time. Therefore, we must preserve the environment and limit the use of fossil energy. The solution to overcome the use of fossil energy is to replace the consumption of energy, mainly used by vehicles, by consuming electrical energy in the means of transportation. Electric vehicles are an excellent solution to keep the environment, aside from reducing the use of fossil energy. Electric vehicles do not produce waste substances or, in other words, emissions that are not produced so that the surrounding air is not contaminated with pollution like waste substances generated by vehicles using fossil energy. Also, electric vehicles can be categorized as energy-saving vehicles. It is our purpose in this study to design an efficient electrical motorcycle prototype, which can be accelerated up to 40 km/h and operational cost ten times less than the usual petrol vehicle with more efficiency.

Keywords — *Electric Motorcycle, BLDC, Controller PWM*

1 Introduction

At this time humans rely heavily on fossil fuels that provide at least three severe threats: (1) depletion of known petroleum reserves, (2) instability/price increases due to higher demand rate of production the oil itself, and (3) greenhouse gas (mainly CO2) pollution caused by the burning of fossil fuels. The development of an environmentally friendly renewable fuel implementation needs to get serious attention worldwide. One way to reduce the use of fossil fuels is to use electricity stored in batteries for vehicles including electric motorcycles [1]. This way, a motorcycle can be enhanced for security [2,3] and automation like IoT [4].

Here in this study, electrical energy in the battery is used as a source of electrical energy in electric motors. The purpose of this study is to design an electric motorbike with 5 kW BLDC motor (7 HP) is expected to drive up 130 km/h with cruises up to 230 km and then use Li-ion batteries or Sodium Silicate. We studied the

amount of the cost needed in one trip and also to analyze the battery power that can be stored and how long the motor can work.

2 Material and Methods

A. Electric Current Direction

An electric current is a flow of electricity that flows. through a conductor or conductor in a closed circuit. The electric current flows from the positive pole to the negative pole within a closed circuit. The direction of the electric current is opposite to the electron current from the negative pole to the positive pole on a closed circuit. When an electric current flows in a particular direction; at the same time, the electron flows in the opposite direction.

B. Ohm's Law

Ohm law is used because the electric current flowing through a conductor always directly proportional to the potential difference applied. A conductor follows the ohms law said that if the resistance value is not depending on the magnitude and polarity of the potential difference applied to it.

C. Definition of System

A system built is a comprehensive system to design an efficient motorcycle. A whole system is a collection of all the components in which each component interacts with each other, where each component to another component has a reciprocal interaction [5]. The power used in electric motorcycles is the electric motor, which is reduced to the roller chain through the gears. This reduction is made to transfer the power that is on the electric motor to the gears to roller chain that can drive the motorcycle.

D. Basic Forms Electric Motorcycles

The shape of the electric motorcycle will be designed and built using the basic framework of CB100 Motorcycle. It is because spare parts that are used are not too many that it reduces the weight of the motorcycle and make it more efficient in use. It is also accessible to a raft and secure release of electronic devices in pairs. At the time of the assembly process of the electric motorcycle, there is not too much change required to keep the authenticity of the components and maintain the motorcycle model CB100.

E. Brushless DC Motor (BLDC)

Electrical Motor Topologies for Aircraft Propulsion

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Abstract

This paper provides the state-of-the art in aircraft electrical propulsion (AEP). Initially, the limitations of on-board energy storage devices are highlighted and contextualised. The definitions of useful measures for determining the suitability of motor design, namely specific power and motor torque per unit rotor volume (TRW), are discussed and relevant examples are provided. The classifications of motors used for terrestrial vehicle applications are reviewed and their limitations highlighted regarding their suitability to AEP applications. A discussion on motor configurations for aerospace applications is provided which includes: synchronous motor stator winding configurations; axial flux motor configurations and the causes of energy losses. Additionally, the topologies and performance characteristics of existing aerospace motor technologies are examined. It was concluded that electrical motors provide an ideal means for achieving aircraft propulsion and that higher motor speeds are likely to be required for future commercial aircraft motor designs.

Keywords : *aircraft electrical propulsion, BLDC, unmanned aircraft, rim driven fan, RDF, specific power, TRV, slotless windings*

1 Introduction

The comparatively low energy storage capacity of electrical aircraft is the only serious obstacle to the development of successful zero-emission flight. Although it is not the aim of this paper to discuss on-board electrical energy storage; it is first considered important to offer a contextual reference to the present feasibility of electrical propulsion for aircraft.

Various methods of electrical energy supply already exist to provide on-board power for propulsion. Fig. 1 provids an indication of power and energy densities of state -of-the-art electrical storage technologies. In [1] existing battery, solar cell, ultra-capacitor and fuel cell technologies are described alongside operational hybrid aircraft and future High-Temperature Superconducting (HTS) systems. HTS technology is becoming increasingly feasible with recent advances in material sciences [2],[3]. Likewise, high -powered metal-air battery technologies, such as lithiumair, offer the potential to equal and surpass the energy release capabilities of hydro-carbon fuels.

Fig. 1 provides an overview of theoretical specific energies of batteries compared with gasoline. Fig. 2. Shows Ragone chart comparing specific energy and power values for electrical storage technologies. At the time of writing, the energy density of practical Lithium-Ion batteries is about 200 Wh/kg whereas Jet-A1 (AvTur) kerosene has an energy density of 11.95 kWh/kg [2]. This is some sixty times greater than is achievable for electrical flight. Thus, it is restricting present aircraft applications to light weight, low speed and short duration flights such as light aircraft, paragliders, unmanned (autonomous) aircraft and model aircraft. Regardless of the means of on-board electrical energy supply, Aircraft Electrical Propulsion (AEP) is likely to bring about the most significant change to the topology of the electric motor for over a century. This paper presents a review of existing motor technologies for aircraft propulsion.

Two useful measures for determining the suitability of a motor design for a particular application are its Specific

Power (kW/kg) and its Torque per unit Rotor Volume (TRV: kNm/m3). The former provides an indication of performance regarding power to weight and allows a comparison to be made between electric motor performance and that of Internal Combustion Engines (ICE). Table I provides an approximate comparison of Specific Power

values for traditional forms of vehicle engines. The latter, TRV (refer to Table II), is a useful guide for designers in sizing an electrical machine as it provides an indication of the effectiveness of the electromechanical energy conversion of motor design. It can be calculated as follows [4]:

$$TRV = \frac{T}{V_{rotor}} = \frac{\pi}{\sqrt{2}} \times k_{w1} \times A \times B = 2\sigma_{mean}$$

$$T = \frac{\pi^2}{4\sqrt{2}} \times k_{w1} \times A \times B \times D^2 \times L_{stk}$$

$$V_{rotor} = \frac{\pi D^2 L_{stk}}{4}$$

$$\sigma_{mean} = \frac{F_{tangential}}{Area} = B \times A$$

Enhanced Internal Quantum Efficiency of Organic Light-Emitting Diodes: A Synergistic Effect

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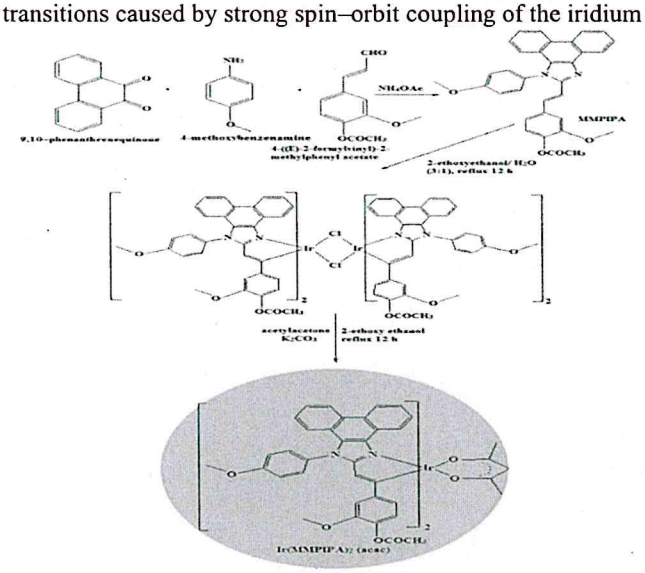
Abstract

The size effect of copper, gold and silver nanoparticles on green OLEDs with MNP-PEDOT: PSS as hole injection layer (HIL) and 4,4'-bis(9-carbazolyl)-biphenyl(CBP): Ir (MMPIPA)$_2$ (acac) as emissive material were analysed. The OLEDs performance was enhanced by copper, gold and silver NPs with 21, 20 and 55 nm, respectively. The external quantum efficiency (η_{ex}) of green OLEDs with Au (20 nm: III) and Ag (55 nm: IV) has been enhanced by 60% and 64%: power efficiency (η_p) enhanced by 46.9% and 38.7% and current efficiency (η_p) enhanced by 50.0% and 72.2%, when compared with control device (I) respectively. In addition higher efficiencies was harvested from OLEDs with co-doped NPs [Au (20nm) -Ag (55nm), L - 51262 cd/m^2; η_{ex} - 9.8%; η_c- 35.3 cd A^{-1} and η_p- 8.2 lm W^{-1} and Cu (21nm) - Ag (55nm), L - 49856 cd/m^2; η_{ex} - 8.3 %; η_c- 32.1 cd A^{-}1 and η_p- 7.5 lm W^{-1}]. The η_{ex}, η_p and η_c of co-doped green OLEDs with Au-Ag NPs was improved by 96.0, 67.3 and 96.1 %, respectively, compared to control device. The size-controlled NPs can synergistically enhanced OLEDs performances by improving the internal quantum efficiency.

Keywords: *Phosphorescence spectrum, plasmon resonance, external quantum efficiency (η_{ex}), MLCT transitions.*

1. Characterization of green emissive material [Ir(MMPIPA)$_2$(acac)

For the heteroleptic iridium complex (Ir(MMPIPA)$_2$ (acac) in (**scheme 1**) the absorption band at 248 nm is assigned to spin-allowed ligand-centered transition of imidazole fragment and absorptions at 304 and 345 nm attributed to MLCT transitions to singlet excited state [^{1}MLCT ← S_0] and triplet excited state [^{3}MLCT ← S_0], respectively (**Fig.1**), both originated from ligand interaction with iridium center of Ir(MMPIPA)$_2$(acac))*i.e.,* effective mixing of these transitions caused by strong spin–orbit coupling of the iridium ion.[1-8]



Scheme 1: Synthesis of iridium (III)bis-2-methoxy-4-((*E*)-2-(1-(4-methoxyphenyl)-1H-phenanthro[9,10-d]-imidazolato-N,C2) (acetylacetonate) [Ir(MMPIPA)$_2$ (acac):]