

SOLAR POWERED AUTONOMOUS QUADCOPTER

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Abstract: The Solar-Powered Autonomous Quadcopter (SPAQ) is a standalone autonomous surveillance system designed to carry out intelligently the capturing of video data from remote locations. Analytically, the SPAQ comprises four units: the solar power system, the autonomous navigation system, the flight control system and the surveillance system. Appropriate designs were made for the constituent parts of the SPAQ system with full implementation carried out on the surveillance system using a KK 2.0 flight controller. The inclusive hardware segment of the SPAQ was achieved with the modular system design approach. The incorporated on-board solar power system is designed to extend the flight time for the SPAQ in order to suit time-tasking applications.

Index Terms -- autonomous, quadcopter, solar power, surveillance

I. INTRODUCTION

A Quadcopter, also called a Quadrotor helicopter or Quadrotor, is a multi rotor helicopter that is lifted and propelled by four rotors. Quadcopters are classified as rotorcraft, as opposed to fixed-wing aircraft, because their lift is generated by a set of rotors (vertically oriented propellers).

Unlike most helicopters, quadcopters use two sets of identical fixed pitched propellers; two clockwise (CW) and two counter-clockwise (CCW). These use variation of RPM to control lift and torque. Control of vehicle motion is achieved by altering the rotation rate of one or more rotor discs, thereby changing its torque load and thrust/lift characteristics.

Early in the history of flight, quadcopter (referred to as 'quadrotor') configurations were seen as possible solutions to some of the persistent problems in vertical flight; torque-induced control issues (as well as efficiency issues originating from the tail rotor, which generates no useful lift) can be eliminated by counter-rotation and the relatively short blades are much easier to construct.

More recently quadcopter designs have become popular in unmanned aerial vehicle (UAV) research. These vehicles use an electronic control system and electronic sensors to stabilize the aircraft. With their small size and agile maneuverability, these quadcopters can be flown indoors as well as outdoors.

There are several advantages to quadcopters over comparably-scaled helicopters. First, quadcopters do not require mechanical linkages to vary the rotor blade pitch angle as they spin. This simplifies the design and maintenance of the vehicle. Second, the use of four rotors allows each individual rotor to have a smaller diameter than the equivalent helicopter rotor, allowing them to possess less kinetic energy during flight. This reduces the damage caused should the rotor hit anything. For small-scale UAVs, this makes the vehicles safer for close interaction. Some small-scale quadcopters have frames that enclose the rotors, permitting flights through more challenging environments, with lower risk of damaging the vehicle or its surroundings. Due to their ease of both construction and control, quadcopter aircraft are frequently used as amateur model aircraft projects.

II. METHODOLOGY OF THE PRESENT WORK

Insects are chosen as models because their nervous system are simpler than other animal species. Also, complex behaviours can be attributed to just a few neurons and the pathway between sensory input and motor output is relatively shorter. Insects' walking behaviour and neural architecture are used to improve robot locomotion. Alternatively, biologists can use hexapod robots for testing different hypotheses.

Biologically inspired hexapod robots largely depend on the insect species used as a model. The cockroach and the stick insect are the two most commonly used insect species; both have been ethologically and neurophysiologically extensively studied. At present no complete nervous system is known, therefore, models usually combine different insect models, including those of other insects.

Insect gaits are usually obtained by two approaches: the centralized and the decentralized control architectures. Centralized controllers directly specify transitions of all legs, whereas in decentralized architectures, six nodes (legs) are connected in a parallel network; gaits arise by the interaction between neighboring legs.


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Mitigation of Certain Power Quality Issues in Wind Energy Conversion System Using UPQC and IUPQC Devices

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ABSTRACT

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Keywords:

improved unified power quality conditioner, power quality, wind energy conversion system, voltage sag, voltage swell

Due to limited conventional energy sources and to meet the increase of load demand there is a need for utilization of renewable energy sources. Among the all renewable energy sources wind energy is widely used and is highly sustainable as compared to other sources of energy. Many wind energy conversion devices working with doubly fed induction generators and synchronous generators and it is integrated to the grid produces the power quality issues like as voltage sags, swells, harmonics, voltage imbalance and short interruptions etc. Many power electronic based Flexible AC Transmission Systems (FACTS) are designed to solve above problems and facilitate to meet the required power demand. In this paper, UPQC (Unified Power Quality Conditioner) and IUPQC (Improved Unified Power Quality Conditioner) models are designed to mitigate the above power quality issues. In this paper, mainly voltage sags, voltage swells and harmonics are considered as a power quality issues to analyze the UPQC and IUPQC devices. The conventional PID controller is employed in control circuit of both the devices. It also discusses the comparative analysis between UPQC and IUPQC devices. The MATLAB/SIMULINK Software is used for above analysis.

1. INTRODUCTION

To meet the required load demand and decrease of fossil fuels, the conventional energy sources such as wind energy, solar energy, nuclear energy, fuel cell etc. are used for generation of electrical energy at generating stations. Among the all renewable energy sources the wind energy is one of the fastest development energy sources in worldwide. At present the wind energy is one of the major power suppliers to the distribution stations [1]. The total installed capacity of the wind power in India up to March 31st, 2019 was 36.625 GW. India is the fourth largest wind power capacity in the world. It expands across all the regions in India [2, 3]. Many issues are arises when the wind form is integrated to the power grid due to increase of nonlinear loads [4].

These issues are Capabilities of reactive power, Requirement of Power factor, Frequency and voltage ride-through capabilities, Impacts on base system conditions, Short circuit and stability effects, Voltage instability and Harmonics and flicker effects [5]. Hence, it is very important to mitigate the above issues. There are many power electronic based devices are introduced to reduce the power quality issues. Active Power Filters, Flexible AC Transmission Systems (FACTS) devices and Shunt capacitors etc., are comes under this category [6].

The authors of the paper [7] published the different power quality issues occurred in the distribution system and there corresponding mitigating techniques. In paper [8], the authors explained designing a fuzzy logic control based SSSC device that improves the stability of the system. The mitigation of power quality issues using Static Synchronous Compensator

(STATCOM) is discussed in papers [9, 10]. Jadhao et al. [11] and Pei and Chen [12] explained the enhancement of power quality using UPQC device.

In this paper at first, UPQC model is developed for mitigating the different power quality issues. Later, improved version of UPQC known as IUPQC model is developed for mitigating the above power quality issues. Conventional PID controller is used for designing the control circuit for both the devices. MATLAB/SIMULINK Software is used for designing the models and to analyze the performance of devices.

In this paper, the concept of WECS and the proposed test system are discussed in section II, UPQC and IUPQC models and concept of conventional PID (Proportional Integral Derivative) controller are explained in section III, simulation results of with and without FACTS devices are discussed in section IV and finally in section V the conclusions of this paper is described.

2. DYNAMICS OF PROPOSED SYSTEM

The proposed test system is shown in Figure 1. It consists of two parallel transmission lines and they are connected to the grid. For analyzing the system first, voltage sag, voltage swell and nonlinear disturbances are created in the first transmission line by including the capacitor load, creation of three phase fault and non linear load at different time instants with help of circuit breakers [13]. This results the second transmission line also experiences the sag, swell and nonlinear disturbances at different instants, because both transmission lines are

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Multi Stage Reliability Optimization Usingstochastic Dynamic Programming

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Abstract

A new approach to Reliability is discussed in this paperand it is not the same in each and every product of the same variety of stochastic dynamic programming. Productreliability has tolerance limits of numerical value with certain randomness or with probability. Algorithms used inproblems pertaining to reliability are mainly stochastic or random in nature. To obtain the maximum system reliability different types of components for which reliability follows a random nature, a technique to solve such problem is required. The applicability of the proposed methodology for problems of stochastic nature has been converted into a problem of deterministic nature and the solution is found to be superior.

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Fuzzy Controller Based Buck Boost and Cuk Converter fed BLDC motor drive

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Abstract- An approach of speed control of the BLDC motor by controlling the dc link voltage of the voltage source inverter (VSI) is used with a single voltage sensor. This facilitates the operation of VSI at fundamental frequency switching by using the electronic commutation of the BLDC motor which offers reduced switching losses. A BL configuration of the buck-boost converter is proposed which offers the elimination of the diode bridge rectifier, thus reducing the conduction losses associated with it. A PFC BL buck-boost converter is designed to operate in discontinuous inductor current mode (DICM) to provide an inherent PFC at ac mains. The performance of the proposed drive is evaluated over a wide range of speed control and varying supply voltages (universal ac mains at 90–265 V) with improved power quality at ac mains. A bridgeless single phase ac-dc rectifier based Cuk derived converter topology fed BLDC motor is proposed to improve power factor at the AC mains near to the unity with low THD for PFC applications. It utilizes one control signal over the whole line cycle. In addition, the proposed converter exhibits low inrush current and low magnetic emissions as classical Cuk topology. The partial elimination of diodes in DBR in the bridgeless topology results in lower conduction losses as compared with conventional BUCK-BOOST converter. The proposed method is simulated in MATLAB/Simulink with PID and fuzzy logic controller for precise speed control. Simulation results are presented along with the theoretical analysis. The proposed concept is implemented by buck boost and cuk converter by using Mat lab/Simulink software.

Key words -Power Factor Correction (PFC), Bridgeless Cuk converters, Total Harmonic Distortions (THD), Power Quality, BLDC motor drive.

I. INTRODUCTION

BLDC motors are most popular in household appliances over the last few decades. As the name indicates, it has no brushes for commutation thus eliminates the disadvantages of wear and tear in conventional DC motors. The switches are electronically commutated with the help of rotor position detected using hall sensors. Hence the BLDC motor is also known as electronically commutated motor [1-3]. Power quality problems have become important issues in these motors due to the recommended limits of harmonics in supply current by

various international power quality standards such as the International Electro technical Commission (IEC). Combination of motor with inverter is the BLDC motor setup. BLDC motor is powered with two level inverter. The two level inverter composed of 6 switches. Based on rotor position obtained from hall sensors/optical encoders/resolvers, the power electronic switches are commutated [4].

A BLDC motor when fed by a diode bridge rectifier (DBR) has higher conduction losses. The high conduction loss caused by the high forward voltage drop of the bridge diode begins to degrade the overall system efficiency. The heat generated within the bridge rectifier may destroy the individual diodes [5]. Hence, it becomes necessary to utilize a bridge rectifier with higher current handling capability or heat dissipating characteristics. This increases the size and cost of the power supply, which is unacceptable for an efficient design. Bridgeless topologies seem to be the best solution for reducing the conduction and switching losses of the converter. Hence, power factor correction (PFC) converters are used for achieving a unity power factor at AC mains [6]. Such converters draw a sinusoidal supply current in phase with the supply voltage while maintaining the DC link voltage at the reference value over a wide range of load variation and supply voltage fluctuations [9].

Several bridgeless topologies are introduced. Bridgeless boost converter requires an additional converter or an isolation transformer to step down the voltage [10]. Bridgeless buck converter is limited for step down applications. Bridgeless SEPIC converter has large number of semiconductor devices in the current conduction path during each switching cycle and has discontinuous output current resulting in a relatively high output ripple. Bridgeless buck-boost converter operates with high peak current in power components and poor transient response that makes it less efficient [11-13].

This paper presents a BL Cuk converter-fed BLDC motor drive with constant dc link voltage of VSI for improved power quality at ac mains with reduced components. The proposed method is simulated in

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Employer Branding: A New Facet of Health Care Sector

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Abstract:-

*"You attract people by the qualities you display,
You keep them by the qualities you possess". – Shaik Haseena*

The dynamic growth of the today's competitive world has made the organization more competitive. To survive in the cut throat competition of the globalization, an organization has to attain its competitive advantage. It should be proactive to face the changes in the scenario. In this scenario, the drivers of the growth of the organization are its human resources. The organizational success does not only depend on the organizational policy, but also on the quality of work which can be achieved by the workforce. It is the human resource that is the drivers of the organization through their skill, aptitude & attitude by deciding, implanting & controlling the activities. This is the time to move for the organization where they have to stand first than its competitors. In this situation talent management has become an important tool for the organizational growth aligned with the individual growth. Hence, the employer paradigm has shifted in relation to the human capital, in terms of its attraction, development, utilization and retention, which placed a heavy demand on today's HR professionals.

The present research is an attempt to evaluate the employer branding in select Hospitals and Medical Colleges. Particularly, it intends to confirm current employer branding practices and their impact on employee performance and job satisfaction in select Hospitals and Medical Colleges of Kurnool District. However, in this study, 4 most significant areas like; Attraction, Development, Utilization and Retention are chosen for analysis. Moreover, it portrays the diversity in the employees' potential and perceptions in the higher education sector.

Key Words: Employer Branding, Strategy, Talent, Job Performance and Job Satisfaction.

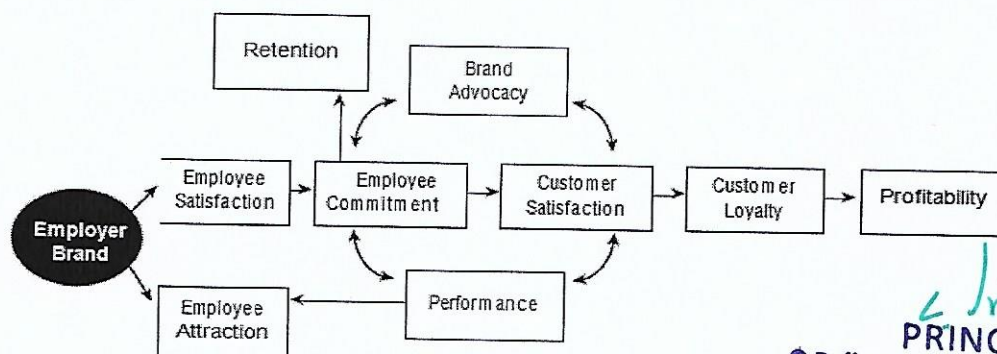
INTRODUCTION:

Employer branding has emerged as a result of the application of the marketing principles to human resource management. This concept was firstly introduced in 1996 in an article presented by Ambler and Barrow.

Ambler and Barrow defined the concept of employer branding as "the package of functional, economic and psychological benefits provided by employment and identified with the employing company". Here Ambler and Barrow have applied the concept of brand to HRM by viewing the employer as the brand and employees as customers.

Employer branding is relatively new approach towards recruiting and retaining the best possible human talent within an employment environment that is becoming increasingly competitive. Sullivan defined employer branding as "a targeted, long-term strategy to manage the awareness and perceptions of employees, potential employees, and related stakeholders with regards to a particular firm". The result of successful employer branding gives the organization an increasing reputation and exposure, coherence among its employees and a high number of applicants as the organization will be described as a great place to work at. Minchington and Estis also define the employer brand as the image of your organization as a great place to work in the minds of current employees and key stakeholders in the external market.

Figure 1 Employer brand model



Source: Gaddam, 2008

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Power-Quality Improvement of a Novel Multilevel Based DSTATCOM

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Abstract-Distribution static compensator (DSTATCOM) is a shunt compensation device that is generally used to solve power quality problems in distribution systems. In an all-electric ship power system, power quality issues arise due to high-energy demand loads such as pulse loads. In this project a new algorithm to generate reference voltage for a distribution static compensator (DSTATCOM) operating in voltage-control mode. Three filter capacitors, one for each phase, are connected in parallel with the DSTATCOM to eliminate high-frequency switching components. The voltage across the filter capacitor is controlled by a dead-beat controller to maintain the AC bus voltage. The magnitude of the bus voltage is chosen as nominal value, i.e., 1.0 p.u., while its phase angle is obtained through a feedback loop that maintains the voltage across the DC storage capacitors. The proposed scheme ensures that unity power factor (UPF) is achieved at the load terminal during nominal operation, which is not possible in the traditional method. Also, the compensator injects lower currents and, therefore, reduces losses in the feeder and voltage-source inverter. Nearly UPF is maintained, while regulating voltage at the load terminal, during load change. The state-space model of DSTATCOM is incorporated with the deadbeat predictive controller for fast load voltage regulation during voltage disturbances. DSTATCOM to tackle power-quality issues by providing power factor correction, harmonic elimination, load balancing, and voltage regulation based on the load requirement and simulation results are presented by using Matlab/Simulink platform.

Index Terms—Current control mode, power quality (PQ), voltage-control mode, voltage-source inverter.

I. INTRODUCTION

Rapid advances in more environmentally-friendly smartgrid technologies are influencing the 21st century leading economies such as the US, China, and Europe to shift from the 20th century electric grid. As these economies become flamboyant and so has the utility of electricity intensified as a catalyst for economic growth among these nations. With transmission and distribution networks still serving as critical link between electric generators and their consumers, the technological sophistication garnered so far does not match the consumer's power quality and reliability demands. Hence, it is about time to transform the current grid (often

referred to as "dumb-grid"). The distribution system is relatively perceived as an interface between the bulk and the custom powers, whose control objective is to strike a balance between the two for maintaining continuous healthy operation of the system. A good distribution control system is therefore expected to enhance the overall system efficiency through loss reduction and power quality control. Presently, distribution system equipment such as the tap changing transformers, synchronous machines, capacitor banks, static voltampere-reactive compensators (SVCs), and many other flexible ac transmission systems (FACTS) controllers at device level, including DSTATCOM are being applied for such control. However, there are numerous challenges facing the area at the moment in terms of the smart-grid de-centralizing functionality which include: voltage and reactive power compensation (now known as Volt-VAR optimisation); distribution system automation (DSA); power factor correction (PF); phase current balancing; integrate-able low loss transformers (to improve efficiency), distributed resources (typically, between 1kW - 50MW), and dispersed energy storage facilities (normally sited at consumer loads), which call for radical change in the type of controllers designed in these equipment for general system power quality improvement. Power quality issues, causes, effects and analysis have become an important aspect of research work in recent days. As the power is generated in power stations which are generally far away from load centers, the huge amount of power generated from a generating station is transported to the consumer through transmission lines. The transmission of power from the generating point to the point of consumption is combined with variations of weather, variations in loads, variations in demands etc. which compromises the quality of power. Industrial and commercial consumers of electrical power are becoming increasingly sensitive to power quality problems. Reliability and quality are two important parameters in the field of power engineering. Combining today's utility power with the ever increasing quantity of electrical sensitive load yields one of the major contributors to downtime in business and industries today.



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Generalized Shear Force and Bending Diagrams Via Singularity Functions by using Matlab and GNU Octave

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Abstract

In 21st century, computers have been playing vital role in engineering and science. Many engineers and scientists utilize computers to solve the complex engineering problems such as C, C++, Java, Fortran, Python, Scilab, MATLAB, etc. Even though these languages are easy to implement in civil engineering discipline such as finite element analysis and mechanics problems, design of reinforced concrete structures, steel structures etc., the students are not comfortable with these languages. Generally in Civil Engineering design are very important. To solve these problems best suitable languages are MATLAB, Scilab, Python, GNU OCTAVE and FORTRAN. Therefore it is necessary to introduce engineering discipline to aid students to solve complex problems by their tutors. In this paper by using singularity functions, the generalized shear force and bending moment loading conditions via medium MATLAB and GNU OCTAVE have been drawn.

Keywords

MATLAB, Singularity Functions and GNU OCTAVE.

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ADD TO CART

Cyber Forensics

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Abstract

The Internet is developing violently, as the number of wrongdoings submitted against or utilizing PCs. As a reaction to the development of PC wrongdoing, the field of digital legal sciences has risen. This cyber forensics is also called as computer forensics. It includes cautiously gathering and inspecting electronic proof that not just surveys the harm to a PC because of an electronic assault, yet in addition to recuperate lost data from such a framework to indict a crook. Here we discuss need for the cyber forensics to be practiced an effective and legal way. PC crime scene investigation is a part of science, managing examination, proof assortment and figuring out in order to decide how the PC was undermined. Various devices and techniques are accessible to assist any procedure with working all the more precisely and to assist agents with gathering, validate and investigate the proof. In any case, most recent innovation is offering a wide range of approaches to conceal those confirmations from the analysts and from the criminological devices they utilize.

Keywords: Computer, Crime, Security, Investigation

1. Introduction

PC legal sciences is the use of examination and investigation frameworks to amass and spare confirmation from a particular enlisting device in a way that is sensible for presentation in an official court. The goal of PC wrongdoing scene examination is to play out a sorted out assessment while keeping up a reported chain of verification to find precisely what occurred on a preparing device and who was liable for it. Measurable agents normally observe a standard arrangement of methodology. After physically isolating the contraption being alluded to guarantee it can't be coincidentally dirtied, specialists make a modernized copy of the device's accumulating media. Exactly when the primary media has been replicated, it is checked a guaranteed or other secure office to keep up its immaculate condition. All assessment is done on the modernized copy. Experts use an arrangement of methodologies and prohibitive programming criminological applications to take a gander at the copy, glancing through covered coordinators and unallocated plate space for copies of deleted, mixed, or hurt records. Any confirmation found on the propelled copy is carefully recorded in a "finding report" and affirmed with the first fully expecting legal methodology that incorporate exposure, sworn statements, or genuine case. PC wrongdoing scene examination has become its own exceptional district of authentic position, with going coursework and insistence.

2. Importance

PC criminology is the way toward using the latest information on science and development with PC sciences to collect, investigate what's more, present affirmations to the evildoer or basic courts. Framework official and security group coordinate and manage

frameworks and information systems should have absolute data on PC lawful sciences. The significance of "crime scene examination" is "to bring to the court". Wrongdoing scene examination is the method which deals in finding verification and recovering the data. The evidence joins various structures, for instance, fingerprints, DNA test or finish records on PC hard drives, etc. The consistency and standardization of PC wrongdoing scene examination across courts isn't seen insistently considering the way that it is new context.

It is important for arrange overseer and safety crew of masterminded affiliations to rehearse PC legal sciences and should know about laws since pace of digital violations is growing remarkably. It is intriguing for troughs and work power who need to know how PC wrongdoing scene examination can transform into a key segment of their affiliation security. Personnel, safety crew and system chairman should understand all of the issues related to PC wrongdoing scene examination PC masters use pushed devices and techniques to recover deleted, hurt or ruffian data and confirmation against ambushes and interferences. These affirmations are assembled to follow cases in criminal and normal courts against those blameworthy gatherings who completed PC infringement.

3. Role of Cyber Forensics in Crime

As advanced wrongdoing increments exponentially, the requirement for PC criminological mastery in law authorization develops with it. There are numerous law implementation offices, for example, your nearby police power, the FBI and endless different substances, who depend on PC legal sciences to get lawbreakers.

PC criminology is rapidly getting utilized for a wide range of zones of criminal examinations and there is currently a technique that is utilized. PCs have been broadly known for being utilized in carrying out a wrongdoing yet now the tables have turned and legal sciences has the edge utilizing PC legal sciences to get hoodlums who accept they don't leave an engraving while perpetrating certain violations.

The job of PC criminology in wrongdoing has progressed to evidentiary confirmation in an official courtroom. This is significant in how the proof is kept up and gathered and it has become a serious exact procedure in law requirement. Request is high for skill in PC legal sciences. The FBI utilizes IT experts to increase genuine proof in their examinations and these violations can be basic or hacking, espionage and even bank extortion. The FBI currently utilizes PC legal sciences as a standard device to examine a wrongdoing. Utilizing gadgets, for example, cell

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An Improved Perturb and Observe based MPPT Algorithm for PV System

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Abstract: Renewable energies have become the major priority in the recent times. They are the most available and exploitable forms of energy that are present in the nature. From the various renewable energy sources photovoltaic energy has transpired to be the most feasible source of electric power and is economically competitive with conventional sources. As the demand keeps on increasing on electricity and rising prices of conventional sources, photovoltaic energy is a promising alternative; it is freely available and less operational and requires low maintenance. Photo Voltaic (PV) systems are equipped with Maximum power point tracking techniques (MPPT) to maximize the PV array output power by tracking continuously. Out of the different techniques Perturb and Observe (P&O) technique is most widely used in commercial MPPT systems because it is less complicated and low cost to implement.

I. INTRODUCTION

Energy is the foremost and most universal measure of all kinds of work by human beings and nature. In this world, every single thing that happens is the expression of flow of energy in one of its forms. Electrical energy is one of the most important forms of energy among all special types of energy that people require every day. Due to the increase of the energy demand and shortage of the non-renewable energy sources the demand for the renewable energy sources has increased. Out of all the renewable energy sources the photovoltaic systems (PV) are getting more significance due to their ease of installation, low maintenance. In isolated mode of power generation these are proven as the effective solution for feeding energy demand in rural areas. A photovoltaic system with Maximum power point tracking (MPPT) algorithm has been presented which increases the system efficiency.

A solar cell in the PV system exhibits the non-linear characteristics. The output power of the PV system mainly depends on irradiance and temperature. Hence the PV system due to these non linear characteristics produces less efficiency in the output power. To increase the efficiency of the PV system, maximum power point tracking techniques are introduced. Various MPPT techniques are used in the recent times to produce high tracking efficiency and good performance of the PV system. Most commonly used MPPT techniques used for

PV system to track maximum power are open-circuit voltage technique, curve fitting technique, short-circuit current technique, Incremental conductance technique, perturbation and observation technique and other techniques. Perturbation and observation technique is most commonly used technique among all these techniques

In this paper PV modeling with MATLAB/SIMULINK maximum power point tracking is done by using P&O technique. The results are compared and the performance of the PV system is evaluated.

II. SYSTEM CONFIGURATION

The system consists of a PV module, DC/DC converter, P&O MPPT block and load. Let us see the

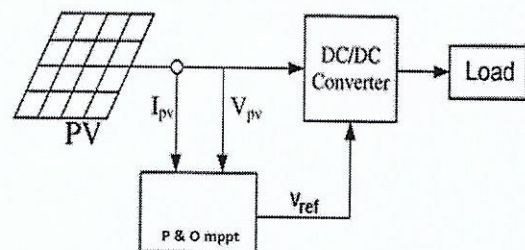


Fig.1. Block diagram of proposed system configuration

Fig.1. shows that PV module consists of multi solar cells. The characteristic of a PV module is same as that of a solar cell expect with the change in the magnitude of current and voltages. A solar module generally consists of 36 or 72 individual cells. A collective PV modules connected in series and or parallel to form an array.

In general PV cells shows nonlinear I-V and P-V characteristics which differ with irradiation and temperature. The classic I-V and P-V characteristics of PV cell are shown in Fig.2

An Alternate Aggregate & Metakaolin Blend In Concrete to Assess Compressive Strength

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Abstract— The current experimental investigation focuses on the influence of Quarry residues and Metakaolin on the compressive strength of concrete. Sand is partially replaced with Quarry dust and cement by Metakaolin in M25 grade of concrete. The present experimentations reveal that Metakaolin can replace cement, and quarry dust can substitute fine sand in concrete to some extent. At 30% replacement of fine sand with Quarry dust, increase in compressive strength was noticed. Simultaneously, 8% replacement of cement with Metakaolin, displayed better compressive strength. The test results were found to be satisfactory with the individual replacements but the combination of Quarry dust and Metakaolin did not yield positive results with respect to compression of concrete.

Keywords: Metakaolin, Quarry dust, Compressive strength, Partial Replacement

I. INTRODUCTION

One of the major achievements of cement and concrete industry during the last few years is the combined use of mineral admixtures and recycled or waste materials. Cement manufacture causes environmental impacts at all stages of the process. These incorporate discharge of airborne contamination as residue and gases, commotion and vibration while operating machinery during blasting operations in the quarries. Concrete generation contributes ozone harming substances straightforwardly through the creation of carbon dioxide when calcium carbonate is warmed and in a roundabout way using energy especially if the energy is sourced from petroleum derivatives. Concrete industry delivers about 5% of worldwide man made carbon dioxide emanations of which half is from synthetic procedure and 40% is from consuming fuel.

High reactive Metakaolin is made through the calcination of a highly pure kaolinite and grinding the products to a fine particle size. Metakaolin presents various advantages in concrete, such as increased strength, increased resistance to chemical attack, enhanced concrete finishes, reduced shrinkage, and reduced permeability. Due to these advantages, Metakaolin is widely used in producing high performance and high strength concrete [11].

Stream sand is most generally utilized fine total in cement yet because of intense deficiency in numerous zones; accessibility, cost and natural effect are the real concern. By substitution of quarry dust, the necessity of land fill region can be decreased and can likewise take care of the issue of common sand shortage. To defeat from this emergency, fractional supplanting of sand with quarry residue can be a financial option. Quarry dust fulfills the purpose for the elective material as a substitute for sand with ease. Concrete shows higher compression quality in the wake of supplanting fine total by stone residue. Stone

residue can be utilized as an added substance in concrete preparation [7].

The main objective of the present experimental investigation is to obtain the influence of the combined application of Quarry dust and Metakaolin on compressive strength of M25 grade concrete. Utilizing distinctive extents of Quarry residue and Metakaolin, compressive quality tests were performed on 150 mm x 150 mm x 150 mm cubes and the outcomes were contrasted with conventional concrete.

II. LITERATURE REVIEW

D V Prasada Rao et.al performed a test examination on the utilization of Metakaolin and Nano-Silica on different properties of concrete. Metakaolin and Nano-Silica are utilized as halfway swap of cement for the preparing of concrete. In light of the test outcomes, it was seen that concrete arranged with a blend of 5% MK and 2% NS demonstrated expanded quality contrasted with the controlled concrete.

C K Kankam et al distributed aftereffects of concentrate on concrete utilizing quarry residue to supplant sand at dimensions of 0%, 25%, and 100% by weight. It was seen that the stress strain bends were comparable for all sand supplanting levels and that concrete with 100% quarry dust had the greatest strain esteems.

Xiao-Yong Wang examined and introduced an incorporated hydration-mechanical-toughness show for assessing different properties of Metakaolin mixed concrete. The proposed coordinated hydration-mechanical-toughness demonstrates was important for the material plan of Metakaolin mixed concrete.

Suzan S Ibrahim et.al carried out studies on blended pastes of partially replaced ordinary Portland cement with different Metakaolin proportions of 5%, 10% and 15%. Scanning electron microscopy micrographs showed the arrangement of denser microstructure for the solidified OPC-MK10 paste when contrasted with flawless OPC pastes after 28 days period of hydration.

P. Dinakar et.al published the effect of incorporating Metakaolin on the mechanical and durability properties of high strength concrete for a steady water/binder ratio of 0.3.

Metakaolin blends with cement substitution of 5, 10 and 15% were intended for target quality and slump of 90 MPa and 100 ± 25 mm. This examination has demonstrated that the Metakaolin can possibly deliver high quality and elite concretes.

J M Khatib et.al decided the compressive quality, density and ultrasonic pulse velocity of mortar containing high volume of Metakaolin as fractional substitution of cement. The results indicated that the maximum strength of mortar occurs at around 20% MK. Compressive strength

Brain Tumour Detection by Morphological Operations

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Abstract—In understanding and gathering information from the images, the technique of image processing is of utmost importance which is the process of modifying or interpreting existing pictures. Medical imaging is the technique and process of creating visual representations of interior of a body for clinical analysis and medical intervention. A tumour develops due to abnormal growth of tissue in any part of the body and is an exceptionally harmful. As tumours develop in any part of the body, it is very difficult to detect and analyse for the better diagnosis. Among those brain tumours detection is a complex process as it is the most sensitive part of human body. Imaging tumours with more accuracy plays a crucial role in diagnosis of tumours. Many medical image processing techniques are available like ultrasound, CT, PET, SPECT, MRI etc. MRI offers contrast concern of different delicate tissues of human body and it does not expose to radiation. Hence, hazards of conventional method are well controlled and provide better outcomes. For analysis and extraction of clear information, processing of samples will be implemented which are taken from the patient. The foremost step of image processing is filtering. Filtering is used to remove unwanted noise for better perception of image. In the proposal tumour will be detected with the help of morphological operations.

(I) INTRODUCTION

Brain is the center of human Central Nervous System (CNS), it has the most complex anatomy of human body. For early detection of abnormalities Magnetic Resonance Imaging techniques is used. In order to understand the tumor detection methods a basic knowledge about the brain tumor, MRI and its types is required. So, in this section we have tried to give a brief introduction about them. A) Brain Tumor: The word brain tumor is a synonym for a word neoplasm which is formed by an abnormal growth of cells. Early detection and correct treatment based on accurate diagnosis are necessary. There are three common types of tumors:

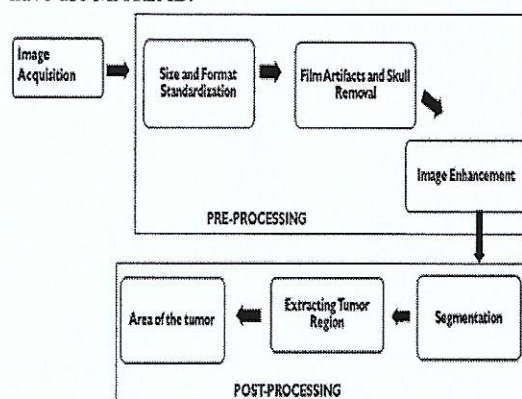
- Benign Tumor: This type of tumors does not expand in an abrupt way; it does not affect its neighboring healthy tissues and also does not expand to non-adjacent tissues.
- Pre-Malignant Tumor: These are precancerous stage, considered as a disease. They may lead to cancer if no proper treatment is there.

c) Malignant Tumor: These are the type of tumors that grows worse with the passage of time and ultimately results in the death of a person.

(B)Magnetic Resonance Imaging: Clinical development of Magnetic Resonance Imaging (MRI) is in the early 1980s. Since then, it has evolved into a routine diagnostic method. It uses a magnetic field and pulse of radio wave energy to take pictures of human soft body tissues. It has a good contrast in comparison to Computed Tomography (CT) Scan. Based on different contrast level MRI can be categorized into various types i.e., T1 weighted, T2 weighted, PD (Proton Density), FLAIR (Fluid Attenuated Inversion Recovery).

(II) PROPOSED WORK

The proposed work can be divided into three sections. First, preprocessing of the input image is done. Secondly, segmentation of the image and finally extraction of the tumor and its area is calculated. The diagrammatic representation is shown in figure 1. For implementation we have use MATLAB.



A. **Image acquisition:** All the obtained images are converted from RGB format to gray level image in 512 × 512 dimensions and in JPEG format

B. **Pre-processing:** In this phase first, we have tried to remove the unwanted portions from the input image like personal information of patients which may present in MRI and also the skull portion. Removing the skull portion is very important in brain MRI as presents of this may lead to misclassifications. Some earlier works on pre-processing is available in the literature [1–3].