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CONTENTS		
<i>Message from the Director</i>		iii
<i>Message from the Assistant Director</i>		iv
<i>Message from the Assistant Director</i>		v
<i>Message from the Principal</i>		vi
<i>Message from the Convener</i>		vii
<i>Committees</i>		viii
1	Arduino Based Digital Fuel Gauge and Vehicle Monitoring System	1
2	Power Quality Improvement using UPQC with Distributed Generation	2
3	Performance of Dynamic Modeling And Optimization Technique of Direct Coupled PV Water Pumping System	3
4	Effective Voltage Regulator For Domestic Loads	4
5	Wireless Based LED Dot Matrix Message Display	5
6	Solar-Wind Hybrid Power Generation	6
7	Improving Voltage Stability on Single Phase Grid Connected Photovoltaic System by using Static VAR Generator	7
8	Design of River Waste Collector Machine Using Arduino	8
9	Operation of Solar Based Water Pumping System with Charge Controller	9
10	15 Level Diode Clamped Multilevel Inverter with Reduced Number of Switches	10
11	Design and Analysis of PV Module with Tracking in Simulink	11
12	Power Quality Improvement by Controlling Fault Currents using NSFCL	12
13	Smart Phone Controlled Metal Detector Vehicle with GSM and Arduino Interfacing	13
14	Smart Safety Helmet	14



15	Solar Powered Voice Controlled Vehicle	15
16	Dynamic Voltage Restorer Using Pi & Fuzzy Logic Control	16
17	Design and Simulation of 100kw Hybrid Grid Connected Solar PV System by using Matlab/Simulink	17
18	A Review on Identification & Analysis of Security Issues and Challenges of IoT based Healthcare	18



# OPERATION OF SOLAR BASED WATER PUMPING SYSTEM WITH CHARGE CONTROLLER

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**ABSTRACT :** Agricultural innovation is evolving quickly. Agrarian applications appropriate for photovoltaic (PV) arrangements are various. These applications are a blend of individual establishments and frameworks introduced by service organizations when they have discovered that a PV arrangement is the best answer for remote farming need, for example, water siphoning for yields or animals. A sun based fueled water siphoning framework is comprised of two fundamental parts. These are PV boards and siphons. The littlest component of a PV board is the sun based cell. Each sun oriented cell has at least two extraordinarily arranged layers of semiconductor material that produce direct flow (DC) power when presented to light. This DC current is gathered by the sun based cells in the board. The gathered current is then given to the Boost converter so as to the lift voltage and is given to AC siphon through the Solar Charge Controller. The point of this article is to clarify how sun based fueledwater siphoning framework works

**Keywords – AC pump, Boost converter, Inverter, Photo-voltaic, Solar**

## 1.INTRODUCTION

Usually to utilize hydro, warm, diesel based vitality to run the engines required for various purposes. While these frameworks can give control where required there are some critical disadvantages, including: Fuel must be transported to the generator's area, which might be a significant separation over some difficult streets and scene. Fuel costs include, and spills can debase the land. Generators require a lot of support and, similar to every mechanical framework, they separate and need new parts that are not constantly accessible. Need of Water for hydro and Coal for warm make them less productive when contrasted with Solar because of its bottomless accessibility of vitality asset . For some rural needs, the option is sun powered vitality. Current, very much planned, easy to-keep up heavenly bodies can give the vitality that is required where it is required, and when it is required. These are frameworks that have been verified far and wide to be practical and solid, and they are as of now raising dimensions of farming efficiency around the world.

Our sun is a characteristic atomic reactor. It discharges minor parcels of vitality called photons, which venture to every part of the 93 million miles from the sun to Earth in about 8.5 minutes. Consistently, enough photons sway our planet to create enough sun based vitality to hypothetically full-fill worldwide vitality requirements for a whole year. Presently photovoltaic power represents just five-tenths of one percent of the vitality devoured in the United States. Be that as it may, sun based innovation is enhancing and the expense of going sunlight based is dropping quickly, so our capacity to outfit the sun's plenitude of vitality is on the ascent. A 2017 report from the International Energy Agency demonstrates that sun based has turned into the world's quickest developing force source– denoting the first occasion when that sun based vitality's development has outperformed that of every single other fuel. In the coming years, we will all appreciate the advantages of sun based produced power somehow.

Sun powered vitality may be one of the most straightforward routes for ranchers to create vitality. Undoubtedly, agriculturists more often than not have a few substantial structures whose rooftops are straightforwardly under the sun, without being upset by the shadows of the trees, transforming them into a perfect spot to settle a photovoltaic framework. Thusly, the utilization of sun powered vitality in agribusiness is winding up progressively mainstream and the vitality delivered from this inexhaustible source can be utilized either on the ranch or in the nearby power framework, giving the rancher an extra pay. One of the zones in agribusiness that benefits the most from sun powered vitality is water system, particularly in parched districts. The principle reason is that utilizing the sun for water system speaks to a temperate circle: when the sun sparkles, it encourages the water system framework, well, we realize that crops needs more water when the sun sparkles a great deal. Consequently, a vast amount of vitality is accessible when it is really required.

## 2.SOLAR PV MODULE

A solitary sun based cell can't give required valuable yield. So to expand yield control dimension of a PV framework, it is required to associate number of such PV sun based cells. A sun based module is ordinarily arrangement associated adequate number of sunlight based cells to give required standard yield voltage and power. One sun based module can be evaluated from 3 watts to 300 watts. The sun powered modules or PV modules are monetarily accessible essential building square of a sun based electric power age framework. As a matter of fact a solitary sunlight based PV cell produces extremely modest sum that is around 0.1 watt to 2 watts. Be that as it may, it isn't down to earth to utilize such low power unit as building square of a framework. So required number of such cells are consolidated together to shape a useful monetarily accessible sun based unit which is known as sun powered module or PV module. In a sun based module the sun oriented cells are associated in same design as the battery cell units in a battery bank framework. That implies positive terminals of one cell associated with negative terminal voltage of sun based module is basic whole of the voltage of individual cells associated in the arrangement module. The ordinary yield voltage of a sun based cell is around 0.5 V consequently in the event that 6 such cells are associated in arrangement, at that point the yield voltage of the cell would be  $0.5 \times 6 = 3$  Volt. In a solar module the solar cells are connected in same fashion as the battery cell



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*"A Fire that kindles other fires"*

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<b>CONTENTS</b>		
<i>Message from the Director</i>		iii
<i>Message from the Assistant Director</i>		iv
<i>Message from the Assistant Director</i>		v
<i>Message from the Principal</i>		vi
<i>Message from the Convener</i>		vii
<i>Committees</i>		viii
1	<b>Fully Automatic Solar Grass Cutter Using Arduino.</b> <i>P. Abhinav Deep, Ch. Akash Babu and M. Siva Kumar</i>	1
2	<b>SVPWM Based Open Loop And Closed Loop V/f Control of Induction Motor</b> <i>K.Rajesh Babu, G.Anvesh Kumar, M.Naresh and B.Praveen kumar</i>	2
3	<b>Outline OF Energy Framework STABILIZER Utilizing ANFIS</b> <i>M. Vinod Kumar, B.M.V.Gowtham, N.Venkat Reddy and M.Ramakrishna</i>	3
4	<b>Stability Enhancement of Wind Power System with UPFC and Energy storage system</b> <i>B.Manohar, M.Hari Prasad and K.Mahesh</i>	4
5	<b>Under Ground Cable Fault Detection By Using Arduino</b> <i>V.Pranay Chowdary, CH.T.V.N.Manikanta, G.Anil Kumar and L.Karunakar</i>	5
6	<b>DFIG Wind Turbines With Super Capacitor Energy Storage for Constant Power Control</b> <i>L.Naresh, K.Avinash, P.Satya sravan and M.M.Karunakar</i>	6
7	<b>Power Transformer Protection using Fuzzy Logic based Differential Relay</b> <i>K.Shiney, N.Manaswini, V.Lakshmi keerthi, K.Nalini prasanna and A.Sai Sunil</i>	7
8	<b>Low frequency Oscillations Damping in SMIB System using Fuzzy based SSSC Controller</b> <i>S.Ramarao, K.Parasuram, M.Venkata vinay, G.Anjibabu and T.Krishna Mohan</i>	8
9	<b>Three Phase Boost Converter for Solar Battery Charging System by Using MPPT Technique</b> <i>Y.C.Ashok Kumar, A.Naga Phaneendra Kumar, P.malli Krishna Reddy and R.Anjaneyulu</i>	9
10	<b>Development of DC-DC Buck Converter Using Arduino</b> <i>A Sekhar Sai Sunil, R Naga Surya Teja, M Anjaneya Reddy and P V N D Sumanth</i>	10
11	<b>Arduino Based Sophisticated Home Automation System for Electrical Appliances Using GSM</b> <i>K Ganesh, M Ravi Chandra, P Raj Kamal, Y Leela Venkatesh and K Rajesh Babu</i>	11
12	<b>Grid Interconnection of Distributed Generation System with Power-Quality Improvement by using STATCOM</b> <i>Greeshma.Lanke, Revathi.Maddirala and Brahma Teja.Saketi</i>	12
13	<b>Distributed Power Flow Controller Based Stabilizer To Damp Power System Oscillations</b> <i>S.Siva Kumari, M.Shekinah and G.Sirisha</i>	13
14	<b>Control of Hybrid Micro Grid In Grid Tied Mode Using Z-Source Converter</b> <i>P.Jhansi, S.Jayasree, B.Ramya, J.Lakshimi Triveni and P.Swathi Mastan</i>	14
15	<b>Line Follower Based Smart Car</b> <i>K.L.N.Satish, T.Teja Sai, S.K.Sai Krishna, G,Naveen Kumar, L.Karunakar</i>	15



16	<b>GSM Based Load Monitoring with Programmable Meter for Energy Audit.</b> <i>T.Krishna mohan, K.Saivarun Teja, B.Anil Kumar, K.Naveen Kumar and G.Praveen</i>	16
17	<b>Visual Accelerometer</b> <i>J Dheeraj Nagarjuna and K Sai Teja</i>	17
18	<b>Hybrid Viterbi's-Johnson's Algorithm for protecting multiple utility grids interfaced microgrid</b> <i>Seebani Mahapatra</i>	18
19	<b>Tool Insert Vibration Measurement</b> <i>A.Kaushika, Y.Nirmal and K.Venkatesh</i>	19
20	<b>Automatic Parking Counter and Parking Slot Status Detection System</b> <i>Vikram, Jay Baswani and Graceson Jeriel Frederick</i>	20
21	<b>A Comparative Analysis of DC-DC Converter For Renewable Energy System</b> <i>P. Venugopal Reddy, V. Venkata Narayana, N. Srikanth, SD. Ameer Sohail and G. Venkatesh</i>	21
22	<b>Arduino Based Obstacle Avoiding Robot controlled by Bluetooth</b> <i>Y. Chiranjeevi Ashok Kumar, K.Pavan Kumar, K.P.M.Y.V. Dathu and M.Revanth Babu</i>	22
23	<b>GSM Based Rewritable Digital Notice Board</b> <i>M.Rama Krishna, N.Ravishankar, P.Venkata Brahmam and I.Vijay Sekhar</i>	23

# DFIG Wind Turbines with Super Capacitor Energy Storage for Constant Power Control

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## ABSTRACT

Wind control is the quickest developing wellspring of electrical vitality on the planet today because of the expanding attention to the ecological issues together with the fast increment in the fuel cost and the power request. Wind fluctuations change utilizing doubly Fed Induction Generator (DFIG) is a standout amongst the most critical kinds of renewable power resources. The wind cultivate control yield has substantial variances because of sudden wind speed changes. Unstable power can frequently cause the infringement of voltage and recurrence constrains in the feeble framework. It can be extreme issue for the framework soundness too. The control framework in the proposed plan of DFIG can diminish control fluctuation with the assistance of Energy Storage System (ESS). Keeping in mind the end goal to decouple the active and reactive powers generated by the machine, field arranged control is connected. Therefore, elite control of energy can be accomplished. The created technique has been tried through displaying a DFIG based breeze vitality framework with ESS utilizing Sim Power System apparatuses of MATLAB and recreated for task as a network associated framework. The execution of DFIG based breeze vitality framework shows agreeable execution under various breeze speed conditions

**KEYWORDS:** wind power, DFIG, Energy Storage System (ESS).

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## I. INTRODUCTION

There has been a tendency towards renewable energy sources due to the rising cost and limited use of fossil fuels in recent years. One of the most important renewable energy sources is wind energy. Grid-connected wind farms are adversely affected by transient states in converting wind energy to electrical energy.

In practice, short-term wind power prediction is carried out to help WTG provide these functions. However, even using the state-of-the-art methods prediction errors are present. Under these conditions, the replacement power is supported by

reserves, which, however, can be more expensive than base electricity prices.

Wind generator (WTG) are usually controlled to generate maximum electrical power from wind under normal wind conditions. However, because of the variations of the wind speed, the generated electrical power of a WTG is usually fluctuated. The generator of wind farm should be selected to compensate grid disturbances within certain limits. Therefore, DFIG is preferred as it provides active power and torque control. Various methods have been developed with a view to reducing the effects of transient states on DFIG. One of these methods is referred to as low voltage ride through



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CONTENTS		
<i>Message from the Director</i>		iii
<i>Message from the Assistant Director</i>		iv
<i>Message from the Assistant Director</i>		v
<i>Message from the Principal</i>		vi
<i>Message from the Convener</i>		vii
<i>Committees</i>		viii
1	Arduino Based Digital Fuel Gauge and Vehicle Monitoring System	1
2	Power Quality Improvement using UPQC with Distributed Generation	2
3	Performance of Dynamic Modeling And Optimization Technique of Direct Coupled PV Water Pumping System	3
4	Effective Voltage Regulator For Domestic Loads	4
5	Wireless Based LED Dot Matrix Message Display	5
6	Solar-Wind Hybrid Power Generation	6
7	Improving Voltage Stability on Single Phase Grid Connected Photovoltaic System by using Static VAR Generator	7
8	Design of River Waste Collector Machine Using Arduino	8
9	Operation of Solar Based Water Pumping System with Charge Controller	9
10	15 Level Diode Clamped Multilevel Inverter with Reduced Number of Switches	10
11	Design and Analysis of PV Module with Tracking in Simulink	11
12	Power Quality Improvement by Controlling Fault Currents using NSFCL	12
13	Smart Phone Controlled Metal Detector Vehicle with GSM and Arduino Interfacing	13
14	Smart Safety Helmet	14

15	Solar Powered Voice Controlled Vehicle	15
16	Dynamic Voltage Restorer Using Pi & Fuzzy Logic Control	16
17	Design and Simulation of 100kw Hybrid Grid Connected Solar PV System by using Matlab/Simulink	17
18	A Review on Identification & Analysis of Security Issues and Challenges of IoT based Healthcare	18

# IMPROVING VOLTAGE STABILITY ON SINGLE PHASE GRID CONNECTED PHOTOVOLTAIC SYSTEM BY USING STATIC VAR GENERATOR.

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**Abstract:** This paper investigate to solve the issues in the system using a shunt controller ,in order to improve the voltage quality in case of small voltage drops and in unbalanced load conditions. The maximum power is obtained from the PV panel by using the incremental conductance algorithm (MPPT) technique . In this paper a repetitive controller is used to reduce the selected harmonics. This paper consists of single phase PV system which is connected to the grid which reduces the harmonic distortions and provides voltage support in the system . The designed PV system provides grid voltage support at fundamental frequency and compensation of harmonic distortion at the point of common coupling. An inductance is added on the grid side in order to make the grid mainly inductive. In this paper ,the PV converter not only supplies the power produced by the panel but also improves the voltage stability.

**IndexTerms** - Maximum Power Point Tracking(MPPT),Distributed power generation system(DPGS),phase-locked loops(PLL).

## I.INTRODUCTION

Among the renewable energy sources ,a noticeable growth of small photovoltaic(PV) power plants connected to low-voltage distribution network is expected in the future. As a consequence, research has been focusing on the integration of extra functionalities such as active power filtering into the PV inverter operation. Distribution networks are less robust than transmission networks, and their reliability, because of the radial configuration, decreases as the voltage level decreases. Hence, usually, it is recommended to disconnect low-power systems when the voltage is lower than 0.85 pu or higher than 1.1pu . For this reason, PV systems connected to low-voltage grids should be designed to comply with these requirements but can also be designed to enhance the electrical system, offering “ancillary services”. Hence, they can contribute to reinforce the distribution grid, maintaining proper quality of supply that avoids additional investments. However, low-voltage distribution lines have a mainly resistive nature, and when a distributed power generation system (DPGS) is connected to a low-voltage grid, the grid frequency and grid voltage cannot be controlled by independently adjusting the active and reactive powers. This problem, together with the need of limiting the cost and size of DPGS, which should remain economically competitive even when ancillary services are added, makes the design problem particularly challenging .This paper proposes to solve this issue using a voltage controlled converter that behaves as a shunt controller, improving the voltage quality in case of small voltage dips and in the presence of nonlinear loads. Shunt controllers can be used as a static var generator for stabilizing and improving the voltage profile in power systems and to compensate current harmonics and unbalanced load current .In this paper, the PV inverter not only supplies the power produced by the PV panels but also improves the voltage profile, as already pointed out. The presented topology adopts a repetitive controller that is able to compensate the selected harmonics. Among the most recent Maximum Power Point Tracking (MPPT) algorithms, an algorithm based on the incremental conductance method has been chosen. It has been modified in order to take into account power oscillations on the PV side, and it controls the phase of the PV inverter voltage .This paper is organized as follows. Section II discusses the possible voltage and frequency support provided by a DPGS converter connected to the grid. Section III discusses the simulation results. Section IV discusses the experimental results. Section V discusses the conclusion. Section VI refers to the reference papers.

## II. PV SYSTEM WITH SHUNT-CONNECTED MULTIFUNCTIONAL CONVERTER

In case of low-power applications, it can be advantageous to use the converter that is parallel connected to the grid for the compensation of small voltage sags. This feature can be viewed as an ancillary service that the system can provide to its local loads. The proposed PV converter operates by supplying active and reactive powers when the sun is available. At low irradiation, the PV converter only operates as a harmonic and reactive power compensator. As explained in Section III, it is difficult to improve the voltage quality with a shunt controller since it cannot provide simultaneous control of the output voltage and current. In addition, a large-rated converter is necessary in order to compensate voltage sags. However, this topology is acceptable in PV applications since the PV shunt converter must be rated for the peak power produced by the panels. In the proposed system, the PV converter



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CONTENTS		
<i>Message from the Director</i>		iii
<i>Message from the Assistant Director</i>		iv
<i>Message from the Assistant Director</i>		v
<i>Message from the Principal</i>		vi
<i>Message from the Convener</i>		vii
<i>Committees</i>		viii
1	Arduino Based Digital Fuel Gauge and Vehicle Monitoring System	1
2	Power Quality Improvement using UPQC with Distributed Generation	2
3	Performance of Dynamic Modeling And Optimization Technique of Direct Coupled PV Water Pumping System	3
4	Effective Voltage Regulator For Domestic Loads	4
5	Wireless Based LED Dot Matrix Message Display	5
6	Solar-Wind Hybrid Power Generation	6
7	Improving Voltage Stability on Single Phase Grid Connected Photovoltaic System by using Static VAR Generator	7
8	Design of River Waste Collector Machine Using Arduino	8
9	Operation of Solar Based Water Pumping System with Charge Controller	9
10	15 Level Diode Clamped Multilevel Inverter with Reduced Number of Switches	10
11	Design and Analysis of PV Module with Tracking in Simulink	11
12	Power Quality Improvement by Controlling Fault Currents using NSFCL	12
13	Smart Phone Controlled Metal Detector Vehicle with GSM and Arduino Interfacing	13
14	Smart Safety Helmet	14



15	Solar Powered Voice Controlled Vehicle	15
16	Dynamic Voltage Restorer Using Pi & Fuzzy Logic Control	16
17	Design and Simulation of 100kw Hybrid Grid Connected Solar PV System by using Matlab/Simulink	17
18	A Review on Identification & Analysis of Security Issues and Challenges of IoT based Healthcare	18

# Solar-Wind Hybrid Power Generation

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**Abstract:** The aim of this paper is to present an idea of pollution free power generation. This paper covers realization of hybrid energy system for multiple applications. Hybrid energy system is the combination of two or more non-renewable or renewable or either combination both renewable and non-renewable energy sources respectively. In this paper, we discussed about realization of hybrid energy system by using solar and vertical axis wind turbine.

**Index Terms** – Charge controller, Domestic loads, Inverter, Solar cell, Storage unit, Vertical axis wind turbine.

## I. INTRODUCTION

Solar-wind hybrid energy systems are used to generate electrical power. Renewable energy experts will explain that a small hybrid system that combines wind and solar power technologies offers several advantages to home appliances because they are available everywhere and anytime throughout the world, with free of cost and maintenance.

The idea of the combined power generation is to get continuous power during day time and night time. This system can be achieved by using vertical axis wind turbine which is called H-Rotor wind turbine, solar panel, Charge controller, Battery, Inverter, Domestic loads.

The energy which is generated by the wind turbine and the solar panel is supplied to battery through charge controller and store in battery. At the same time it is supplied to inverter for domestic use. When there is no enough power available the energy stored in battery will be used by the domestic loads.

## II. IDEA OF WORKING MODEL:

This model gives 230v supply at the output by using inverter which takes the energy from the solar panel and from the wind turbine through charge controller and storage unit.

## III. TECHNOLOGY USED:

1. SOLAR PANEL
2. WIND TURBINE
3. CHARGE CONTROLLER
4. STORAGE UNIT
5. INVERTER
6. LOAD

### 1. SOLAR PANEL:

Here what we used is 40W solar panel to generate electricity. Solar cells are also called as Photo Voltaic cells. PV (Photo-voltaic) cells are made up of semiconductor structures. Sun rays are absorbed by this material and electrons are emitted from the atoms. This release activates a current. Solar power is converted into the electric power by a common principle called photo electric effect. The solar panel consists of an appropriate number of solar cell modules connected in series or parallel based on the required current and voltage generator. Here we require 12v so we used series connected solar cell modules.

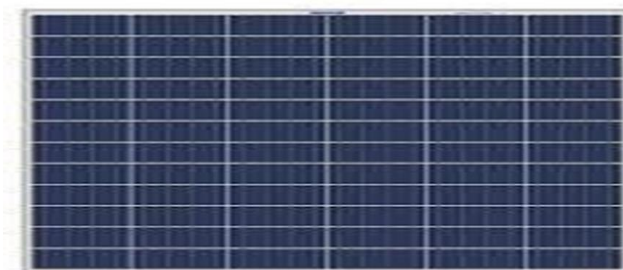


Fig 1. 40W SOLAR PANEL



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CONTENTS		
<i>Message from the Director</i>		iii
<i>Message from the Assistant Director</i>		iv
<i>Message from the Assistant Director</i>		v
<i>Message from the Principal</i>		vi
<i>Message from the Convener</i>		vii
<i>Committees</i>		viii
1	Arduino Based Digital Fuel Gauge and Vehicle Monitoring System	1
2	Power Quality Improvement using UPQC with Distributed Generation	2
3	Performance of Dynamic Modeling And Optimization Technique of Direct Coupled PV Water Pumping System	3
4	Effective Voltage Regulator For Domestic Loads	4
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7	Improving Voltage Stability on Single Phase Grid Connected Photovoltaic System by using Static VAR Generator	7
8	Design of River Waste Collector Machine Using Arduino	8
9	Operation of Solar Based Water Pumping System with Charge Controller	9
10	15 Level Diode Clamped Multilevel Inverter with Reduced Number of Switches	10
11	Design and Analysis of PV Module with Tracking in Simulink	11
12	Power Quality Improvement by Controlling Fault Currents using NSFCL	12
13	Smart Phone Controlled Metal Detector Vehicle with GSM and Arduino Interfacing	13
14	Smart Safety Helmet	14



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# Wireless Based LED Dot Matrix Message Display

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**Abstract:** The information sharing aspect of information technology is playing a prominent role in all kinds of business either it's non-profit organization or profit organization. Now a days, all types of business requires and adopts the facility of advertisement to promote their services and products. Digital advertisement is the current requirement of the modern businesses sand information world. Scrolling led dot matrix displays are used at international airports, stock exchanges, metro railway stations, shopping complex, bus stations etc. led display is an effective mode on displaying information but the complicated task is to make the message dynamic as the users have to change the message content according to this specific requirements. In case of changing the message content the user have to connect the led display with the computer, so that the display board cannot be placed any where because of dedicated and complex wiring pattern. Wireless based dot matrix display makes the wireless connection between user mobile and led display. It provides the facility of real time message displaying means the user can change the message content that is to be display. A mobile is used to send the message to the led display and the microcontroller does all processing of displaying the message content on the led display in scrolling pattern. The aim of the project is to develop a wireless scrolling message board that facility the user to change the message content without connecting the display board with the computer or laptop through a cable. The user can update the message content through Bluetooth or Wi-Fi.

**Index Terms:** LED, Dot-matrix display, Arduinio uno, Bluetooth, Wi-Fi LED Controller

## I. Introduction

This project is based on the idea of designing a led display system for wireless communication between mobile and led display. In this, wireless communication is done by Wi-Fi or Bluetooth. Now a day every mobile consist of Wi-Fi and Bluetooth features. The users having mobile hand set can send message to the display to flash or to display message content in scrolling pattern. Bluetooth module is used to receive the message in circuit. The message content sent by the user is stored in Bluetooth module in case, the user can sent message by using wifi then led controller was received the message and stored in it. The led dot matrix display consist 8\*8 matrix with a distance between the rows or pins is 10mm. a preprogrammed microcontroller is used to supply with the standard format of character set containing character and alphabets with the possibility of generating and displaying punctuation marks, numbers, special characters, simple graphics. Each character is display in the pattern based on hexadecimal values that are stored in the microcontroller that is termed as look up or match table. The microcontroller looks or matches from pattern and sent out the data bits serially and clock signal. Shift registers are used to shift dada between the pins connected to each led. Persistence of vision is the based of the fast scanning of data that is set on rows and column, which allows the pattern to be display because of persistence of vision. Decode counter is used to control the rows on the bases of pulses that is connected to the clock input of the microcontroller the design involves both hardware and software. The wireless system of communication requires the following hardware components

- LED dot matrix Display
- HC-05 Bluetooth module
- Arduino Uno
- Power Supply (5V)
- WIFI Led controller

## II .BLOCK DIAGRAM:

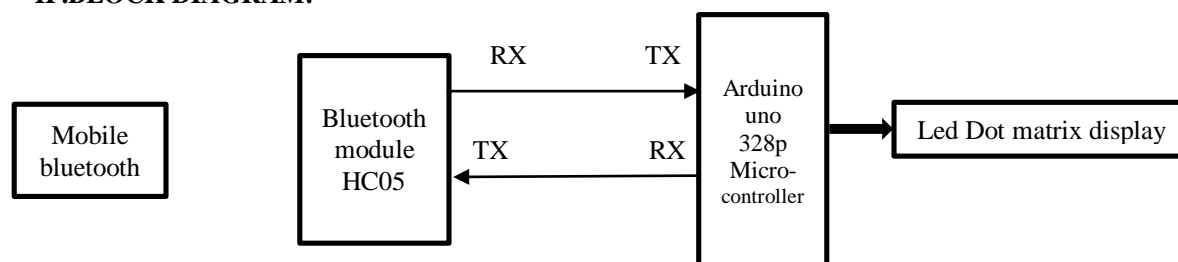


fig.1 block diagram of bluetooth based led dot matrix display



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CONTENTS		
<i>Message from the Director</i>		iii
<i>Message from the Assistant Director</i>		iv
<i>Message from the Assistant Director</i>		v
<i>Message from the Principal</i>		vi
<i>Message from the Convener</i>		vii
<i>Committees</i>		viii
1	Arduino Based Digital Fuel Gauge and Vehicle Monitoring System	1
2	Power Quality Improvement using UPQC with Distributed Generation	2
3	Performance of Dynamic Modeling And Optimization Technique of Direct Coupled PV Water Pumping System	3
4	Effective Voltage Regulator For Domestic Loads	4
5	Wireless Based LED Dot Matrix Message Display	5
6	Solar-Wind Hybrid Power Generation	6
7	Improving Voltage Stability on Single Phase Grid Connected Photovoltaic System by using Static VAR Generator	7
8	Design of River Waste Collector Machine Using Arduino	8
9	Operation of Solar Based Water Pumping System with Charge Controller	9
10	15 Level Diode Clamped Multilevel Inverter with Reduced Number of Switches	10
11	Design and Analysis of PV Module with Tracking in Simulink	11
12	Power Quality Improvement by Controlling Fault Currents using NSFCL	12
13	Smart Phone Controlled Metal Detector Vehicle with GSM and Arduino Interfacing	13
14	Smart Safety Helmet	14



15	Solar Powered Voice Controlled Vehicle	15
16	Dynamic Voltage Restorer Using Pi & Fuzzy Logic Control	16
17	Design and Simulation of 100kw Hybrid Grid Connected Solar PV System by using Matlab/Simulink	17
18	A Review on Identification & Analysis of Security Issues and Challenges of IoT based Healthcare	18

# Effective Voltage Regulator For Domestic Loads

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**Abstract:** This paper presents an effective voltage regulator which possess hardness, less cost and subsistence in a way to avoid power electronic devices the above features make it suitable for domestic loads. So, that operational cost in power quality improvement is reduced. The proposed voltage regulator consists of multi winding transformer, Circuit Breakers which acts as switches. Distinct Voltage Compensation steps are attained by modifying the connections and changing polarity between primary and secondary windings. The multi winding transformer has been optimized to attain a greater efficiency and low cost voltage regulator. A controller unit monitors the output voltage and sets the minimal compensation step. Simulation and programming results are represented to exhibit the voltage regulator operation.

**IndexTerms** – Polarity switching, Serial voltage Compensation, domestic loads, voltage regulation, multi winding transformer

## I. INTRODUCTION

In the present scenario domestic loads are mostly effected to long duration voltage variations. The voltage variations here refer to over voltage and under voltage and these are the major drawbacks in the distribution network. In India, the standard voltage limits are  $230 \pm 7\%$ . The voltage range should be maintained within the permissible limits. The major drawback of the distribution network is occurring of over voltage and under voltage due to long distance because of this voltage fluctuations the domestic loads are mostly effected. Domestic loads refer to house hold appliances which consume electrical energy. The devices are designed with reference to the standard limits. Otherwise the appliances may get damaged.

Long duration over and under voltages will occur in rural areas as compared to the urban areas because customers are in scattered configuration to the distribution. So that length of the transmission line is more. If the length is more copper losses are more due to which the efficiency is reduced.

Now a days the existing voltage regulators are designed by using power electronic devices. In order to run them we need external devices like firing angle control equipment and the switching sequence of the SCR's we're facing commutation issues, overheating, malfunctioning of devices and harmonics are produced which disturbs the entire operation. It results in increase in the operational cost of the regulator.

To avoid the power electronic device losses and distribution losses we need to place a compensating equipment in between the load and the distribution system. Here we preferred voltage regulators. Now we are proposing the voltage regulator without any power electronic devices and it has characteristics like hardness, less cost and high efficient. These characteristics can satisfy the domestic load needs. Losses are also very less as compared to the conventional voltage regulators.

## II. OPERATING PRINCIPLE OF VOLTAGE REGULATOR

The effective voltage regulator contributes serial voltage compensation. In this paper, voltage is compensated using two regulating principles namely voltage ratio regulation and polarity selection. The voltage regulator consists of a shell type transformer with multi windings which comprises two primary windings which are connected across the supply. The secondary winding acts as a compensating winding which is connected in to the input.

Discrete values of compensation can be achieved by changing the connection between the primary and secondary windings with three power contactors. A controller unit will compare the input voltage which has supplied to the domestic loads. This controller will compare input voltage value with the reference voltage. If compensation is necessary due to voltage fluctuations then controller will send a signal to the contactor. The contactors work in accordance with the controller unit.

The feature of the effective voltage regulator make it aptable for the needs of the long distance loads.

### 2.1 Step Voltage Regulation:

By using the technique of step voltage regulation, the voltage is to maintain the minimum input voltage at the consumer end. This process is done by using an auto transformer mechanism.

### 2.2 Sturdiness:

As the proposed voltage regulator design will be placed outdoor, at remote locations. So, the voltage regulator should be sturdy in nature, reliable and maintenance. Power contactors are used than power electronic devices to get high efficiency.



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CONTENTS		
<i>Message from the Director</i>		iii
<i>Message from the Assistant Director</i>		iv
<i>Message from the Assistant Director</i>		v
<i>Message from the Principal</i>		vi
<i>Message from the Convener</i>		vii
<i>Committees</i>		viii
1	Arduino Based Digital Fuel Gauge and Vehicle Monitoring System	1
2	Power Quality Improvement using UPQC with Distributed Generation	2
3	Performance of Dynamic Modeling And Optimization Technique of Direct Coupled PV Water Pumping System	3
4	Effective Voltage Regulator For Domestic Loads	4
5	Wireless Based LED Dot Matrix Message Display	5
6	Solar-Wind Hybrid Power Generation	6
7	Improving Voltage Stability on Single Phase Grid Connected Photovoltaic System by using Static VAR Generator	7
8	Design of River Waste Collector Machine Using Arduino	8
9	Operation of Solar Based Water Pumping System with Charge Controller	9
10	15 Level Diode Clamped Multilevel Inverter with Reduced Number of Switches	10
11	Design and Analysis of PV Module with Tracking in Simulink	11
12	Power Quality Improvement by Controlling Fault Currents using NSFCL	12
13	Smart Phone Controlled Metal Detector Vehicle with GSM and Arduino Interfacing	13
14	Smart Safety Helmet	14

15	Solar Powered Voice Controlled Vehicle	15
16	Dynamic Voltage Restorer Using Pi & Fuzzy Logic Control	16
17	Design and Simulation of 100kw Hybrid Grid Connected Solar PV System by using Matlab/Simulink	17
18	A Review on Identification & Analysis of Security Issues and Challenges of IoT based Healthcare	18

# Performance of Dynamic Modeling And Optimization Technique of Direct Coupled PV Water Pumping System

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**Abstract:** Due to insufficient of electricity and escalate diesel costs, the solar energy based water pumping system has emerged as a promising alternative to the conventional electricity. The diesel based water pumping systems used in urban, rural and remote regions to pump water for irrigation purpose and community water supplies. Solar PV water pumping system can provide drinking water without a need for any kind of fuel or extensive maintenance as required by the diesel pumps. Permanent Magnet (PM) Brushless DC (BLDC) motors have been widely used in industrial drives due to their high performance, high torque density and low acoustic noise. The aim of this paper is to develop a dynamic modeling for the design of a PV water pumping system by combining the models of the water demand, the solar PV power and the water pumping system. . Solar water pumping is found to be economically viable in comparison with diesel or electricity based systems for the purpose of irrigation needs and water supplies in urban, rural and remote regions. The complete model is simulated using MATLAB/SIMULINK and HARDWARE. The simulated results emphasize the significance of the proposed method to attain the maximum power from PV with minimum motor losses. This paper explains how solar powered water pumping system works and what the differences with the other energy sources.

**KEYWORDS** – SOLAR PV PANEL, DC-DC BOOST CONVERTER, PMBLDC MOTOR AND WATER SOURCE.

## I. INTRODUCTION

A solar-powered pump is a pump that should be running on the electricity generated by the PV panels or the radiated thermal energy available from using solar energy as a power source, such solar water pumps are basically consist of collected sunlight as opposed to grid electricity.

A solar energy-powered water pump is a water pump that will run on the electricity that is generated by the solar photovoltaic modules.

Using solar energy as power source, the solar water pumps are basically consists of three main components:

- 1) The water pump
- 2) Solar photovoltaic modules
- 3) DC-DC boost converter

A water pump basically is an electro-mechanical device that moves water by mechanical action and powered by an electricity generating source, which can be manifold, such as diesel engines, wind power or solar energy. According to water table level, distance to move from the water and the pumping quantity requirements, different type sizes of water pumps should be apply.

The most common and the different types of pumps we use are basically surface-mounted pumps and submersible (deep-well) pumps – as shallow-well water pumping requirements are different from those for deep-well water pumping. In latter situations of wells deep in the ground, it makes much more sense to put the water pump near to the well source in order to basically push up the water.

The water pumping amount requirements, electricity supply and sun irradiance conditions determine the overall size of the PV system and thus the output power and quantity of solar photovoltaic modules needed.

The pump controller is the most important component of the system. It matches the input and output power of the pump and solar panels and it also provides the voltage protection. With the pump controller the operator adjusts the pump pressure, frequency, flow, operational times etc. According to the end user requirements, there are various categories of pump controllers to choose from, depending on the solar pump motors (AC or DC).



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CONTENTS		
<i>Message from the Director</i>		iii
<i>Message from the Assistant Director</i>		iv
<i>Message from the Assistant Director</i>		v
<i>Message from the Principal</i>		vi
<i>Message from the Convener</i>		vii
<i>Committees</i>		viii
1	Arduino Based Digital Fuel Gauge and Vehicle Monitoring System	1
2	Power Quality Improvement using UPQC with Distributed Generation	2
3	Performance of Dynamic Modeling And Optimization Technique of Direct Coupled PV Water Pumping System	3
4	Effective Voltage Regulator For Domestic Loads	4
5	Wireless Based LED Dot Matrix Message Display	5
6	Solar-Wind Hybrid Power Generation	6
7	Improving Voltage Stability on Single Phase Grid Connected Photovoltaic System by using Static VAR Generator	7
8	Design of River Waste Collector Machine Using Arduino	8
9	Operation of Solar Based Water Pumping System with Charge Controller	9
10	15 Level Diode Clamped Multilevel Inverter with Reduced Number of Switches	10
11	Design and Analysis of PV Module with Tracking in Simulink	11
12	Power Quality Improvement by Controlling Fault Currents using NSFCL	12
13	Smart Phone Controlled Metal Detector Vehicle with GSM and Arduino Interfacing	13
14	Smart Safety Helmet	14



15	Solar Powered Voice Controlled Vehicle	15
16	Dynamic Voltage Restorer Using Pi & Fuzzy Logic Control	16
17	Design and Simulation of 100kw Hybrid Grid Connected Solar PV System by using Matlab/Simulink	17
18	A Review on Identification & Analysis of Security Issues and Challenges of IoT based Healthcare	18



# Power Quality Improvement using UPQC with Distributed Generation

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**Abstract:** In recent year, for electrical energy production, renewable energy sources played the main role in the system. Power quality has become a more important issue. The power electronics based conditioning devices can be an effective solution for improving power quality in the power system network. This paper deals with design, modeling, and simulation of the Unified Power Quality Conditioner (UPQC) with Distribution Generation (DG). Unified power quality conditioner is a combination of combined series and shunts active power filters for simultaneous compensation of current and voltage problems. This system integrated with solar energy is able to compensate voltage problems like voltage sag /swell, load current disturbances. This proposed system was also able to compensate the voltage interruptions and active power transfer to load and source in both islanding and interconnected mode operation and help to improve the power quality. The working of UPQC with DG has been analyzed and presented through simulation studies using MATLAB/SIMULINK software.

**Index Terms** – Power Quality (PQ), Unified Power Quality Conditioner (UPQC), Active Power Filters (APF), Phase Locked Loop (PLL), Distributed Generation (DG), Voltage Source Inverter (VSI), Distribution Static Compensator (DSTATCOM), Dynamic Voltage Restorer (DVR), Fast Fourier Transform (FFT).

## I. INTRODUCTION

UNIFIED POWER QUALITY CONDITIONER [UPQC] system was widely studied by many of the researchers as an eventual method for improving the PQ in electrical distribution system. The term “power quality” (PQ) has gained a significant attention in the past few years. The advancement in power electronics devices plays an important role. Nowadays modern semiconductor switching devices such as controlled rectifiers, Uninterruptible Power Supplies (UPS), an arc furnace etc. are widely used particularly in industrial and domestically loads.

Loads which are commonly used are non-linear in nature and thus create power quality problems like voltage sag, voltage swell, voltage interruption, voltage flickers, voltage spikes, harmonics etc. Such poor power quality causes an increase in power losses and other abnormalities in distribution sides. Therefore, it was very important to maintain the high standard of power quality. In past, passive filters were used to solve power quality problems. However, because of some limitations of passive filters, nowadays custom power devices are used to solve power quality problems in the distribution side.

The compensating custom power devices are used for load balancing, active filtering, power factor improvement and voltage regulating (sag/swell). Reactive power compensation is one of the common and very important issues for power system engineers at transmission as well as at the distribution level. Generally, the load-reactive power demand level is mainly affected by the different type of loads present on the network. The capacitor banks are commonly used to compensate for the load-reactive power demand. It is the simplest and under certain conditions, is a very effective way to compensate for the load-reactive power demand.

Apart from these, the DG system can minimize feeder loading and improves the power transfer capability of the distribution system. To obtain the utmost utilization of the DG system a smart integration of all renewable energy resources and loads are required. This smart way is accomplished using a common bus and operates at the same frequency. The UPQC with DG helps to compensate current and voltage related power quality problems and have given additional benefit by providing the power to load whenever voltage interruption occurs with source side [1].

This paper was discussed with combined operation of UPQC with DG and this system is integrated with solar energy. The proposed system will compensate voltage swell/swag, load current disturbances. In addition to this, it is able to compensate voltage interruption and active power transfer to load and source in both interconnected and islanding mode and help to improve power quality. This paper proposes a new configuration of UPQC that has a DG connected to the dc link through the rectifier as shown in Fig. 4. The UPQC will compensate the voltage interruption in the source, while the DG supplies power to the source and load or the load only. There are two modes of operation in the proposed system. One is called the interconnected mode, in which the DG provides power to the source and the load. The other one is called the islanding mode, in which the DG provides power to the load only within its power rating. The operation of DG with UPQC has been evaluated through simulation studies using MATLAB/SIMULINK software [2].

## II. UNIFIED POWER-QUALITY CONDITIONER (UPQC)

Unified Power Quality Conditioner (UPQC) is one of the most common used custom power devices, which can solve voltage and current related problem simultaneously. This is connected before load to make load voltage free from distortion and at the same time reactive current drawn from source should be compensated at source side and would be in phase with supply voltage.



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CONTENTS		
<i>Message from the Director</i>		iii
<i>Message from the Assistant Director</i>		iv
<i>Message from the Assistant Director</i>		v
<i>Message from the Principal</i>		vi
<i>Message from the Convener</i>		vii
<i>Committees</i>		viii
1	Arduino Based Digital Fuel Gauge and Vehicle Monitoring System	1
2	Power Quality Improvement using UPQC with Distributed Generation	2
3	Performance of Dynamic Modeling And Optimization Technique of Direct Coupled PV Water Pumping System	3
4	Effective Voltage Regulator For Domestic Loads	4
5	Wireless Based LED Dot Matrix Message Display	5
6	Solar-Wind Hybrid Power Generation	6
7	Improving Voltage Stability on Single Phase Grid Connected Photovoltaic System by using Static VAR Generator	7
8	Design of River Waste Collector Machine Using Arduino	8
9	Operation of Solar Based Water Pumping System with Charge Controller	9
10	15 Level Diode Clamped Multilevel Inverter with Reduced Number of Switches	10
11	Design and Analysis of PV Module with Tracking in Simulink	11
12	Power Quality Improvement by Controlling Fault Currents using NSFCL	12
13	Smart Phone Controlled Metal Detector Vehicle with GSM and Arduino Interfacing	13
14	Smart Safety Helmet	14



15	Solar Powered Voice Controlled Vehicle	15
16	Dynamic Voltage Restorer Using Pi & Fuzzy Logic Control	16
17	Design and Simulation of 100kw Hybrid Grid Connected Solar PV System by using Matlab/Simulink	17
18	A Review on Identification & Analysis of Security Issues and Challenges of IoT based Healthcare	18

# ARDUINO BASED DIGITAL FUEL GAUGE AND VEHICLE MONITORING SYSTEM

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**Abstract:**Design and execution of advanced fuel check which estimates the precise dimension of fuel including while fuel filling process. Presently a-days all fuel bunks having sorts of computerized presentations unit so as to show the estimation of fuel adding to the vehicle. In any case, we don't know whether they including exact esteem or not. By settling the weight sensor beneath the fuel tank, anytime of time it will consistently measures the dimension of fuel with the assistance of processor and presentations the incentive in the computerized numeric structure in the showcase unit. Thus, the deliberate qualities and area of fuel added is sent to the proprietor portable through GPS and GSM and vehicle proprietor knows about the fuel utilization through SMS administrations.

**Index terms:** Ultrasonic sensor, Arduino UNO, LCD Display, GPS, GSM.

## I.Introduction:

A fuel level indicator (fuel check) is a gadget within a vehicle that estimates the measure of fuel still in the vehicle. This sort of framework can be utilized to gauge the measure of gas or some other kind of fluid. It will regularly comprise of a detecting or sending unit that estimates the measure of fuel in reality left and a check or pointer that transfers this data outside the fuel compartment. A fuel measure can be planned in various distinctive ways and numerous checks have a few defects that can make the readings not exactly precise. The two sections of a fuel check are the detecting or sending unit and the marker or measure. A detecting unit is the piece of a fuel check found inside or associated with the real fuel stockpiling compartment on a vehicle. On a vehicle nowadays, for instance, the detecting unit will comprises of a buoy inside the fuel tank, which is associated with a metal pole that hurries to a little circuit. The buoy raises or brings down contingent upon the Amount of fuel in the fuel tank.

The fuel level indicator exhibited here carefully shows the dimension of fluid inside the tanks utilizing weight sensor and can be utilized for estimating the dimension of some other kind of fluid. The fuel (fluid) level is naturally recognized by the gauging Mass of the fluid by weight sensor and showing the yield on a Display gadget (LCD). The contribution of the framework is the load connected on the weight sensor. Weight sensor produces electrical flag relating to the load and the yield flag is intensified by the speaker. The enhanced flag given to the ADC which create computerized yield given to the microcontroller

## II.COMPONENTS :

The fundamental parts required for the working of the above proposed arrangement are explained beneath.

### A .Arduino UNO:

The Arduino UNO is an open-source microcontroller board dependent on the Microchip ATmega328A microcontroller and created by Arduino. The board is furnished with sets of advanced and simple info/yield (I/O) sticks that might be interfaced to different extension sheets (shields) and different circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) by means of a sort B USB link. It very well may be controlled by a USB link or by an outer 9 volt battery, however it acknowledges voltages somewhere in the range of 7 and 20 volts. It is additionally like the Arduino Nano and Leonardo.

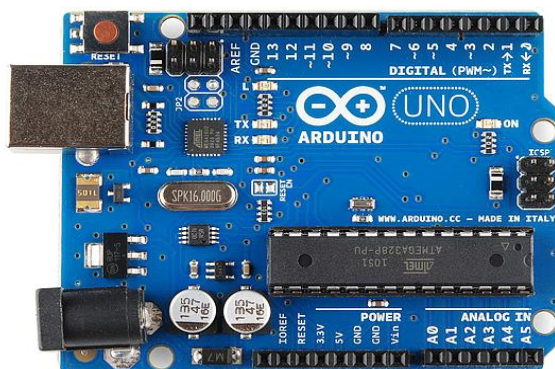


fig.1.arduinouno



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**Table of Contents**

<b>S.No</b>	<b>Title</b>	<b>Page. No</b>
1	Review on Design & Testing of CCD Detector Data Generation & Acquisition System Ankit Dhulekar, Bharat Tank	1
2	GDI Logic Based Design of Hamming-Code Encoder and Decoder for Error Free Data Communication Sucharitha D, Prudhvi Raj N, Sravya Reddy B, Sudheer Raja V	5
3	A New Approach of Digital Signature Verification based on BioGamal Algorithm Rashmi Kasodhan, Neetesh Gupta	10
4	A new approach to ROI based image compression using Simple Sliding Window Spatial Filter Rajasekhar Reddy M , Ravichandran K.S., Anashwara.P, Aishwarya.S, Venkatraman	16
5	A Novel Optimized Classifier For the Loan Repayment Capability Prediction System Soni P M , Varghese Paul	23
6	Voice and Gesture Controlled Wheelchair Ms. Cynthia Joseph, Aswin S, Sanjeev Prasad J	29
7	A Study on Single and Multi-layer Perceptron Neural Network Jaswinder Singh, Rajdeep Banerjee	35
8	Dynamic Source ACO algorithm for energy-aware cloudlet-based mobile cloud computing architecture Anjaria Kushal, Patel Raj, Prajapati Naitik, Prajapati Tapan, Thakkar Anjali	41
9	Wearable Exoskeleton Assisted Rehabilitation in Multiple Sclerosis by Using Conventional Control Methods G.S. Sreehari, M. Vijay, A.V. Pavan Kumar	49
10	A Survey on Recommendation System for Bigdata using MapReduce Technology Maulik Dhamecha, Krupa Dobaria, Dr. Tejas Patalia,	54
11	Design and Analysis of A Photovoltaic System with a DC-DC Boost Converter A.Chandramouli, V.Sivachiadambaranathan	59
12	Exploring Pain Insensitivity by 'ZFHX2' Point Mutation –An Alternative Analgesic Strategy – A Deep-Pharmacogenomic Approach Akshayaa S, Vidhya R, Hima vyshnavi A M, Krishnan Namboori P K	68
13	An Optimized LDAE Approach over CTM-SVM for Analyzing Prediction of Violence on Cyber Post Suhrid Singh, Neetesh Kumar Gupta	73
14	Low Cost Eye Gaze Tracker Using Web Camera M. Sai Mounica, M. Manvita, C. Jyotsna, Amudha J.	79
15	A Systematic Review of the Third Party Auditing in Cloud Security: Security Analysis, Computation Overhead and Performance Evaluation T. Kishore Babu, Guruprakash C D	86

# A Systematic Review of the Third Party Auditing in Cloud Security: Security Analysis, Computation Overhead and Performance Evaluation

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**Abstract**—Cloud storage offers a considerable efficiency and security to the user's data and provide high flexibility to the user. The hackers make attempt of several attacks to steal the data that increase the concern of data security in cloud. The Third Party Auditing (TPA) method is introduced to check the data integrity. There are several TPA methods developed to improve the privacy and efficiency of the data integrity checking method. Various methods involve in TPA, analyzed in this review in terms of function, security and performances. Merkel Hash Tree (MHT) method provides efficiency and security in checking the integrity of data. The computational overhead of the proof verify is also analyzed in this review. The communication cost of the most TPA methods observed as low and there is a need of improvement in security of the public auditing.

**Keywords**—Cloud security, Cloud storage, Communication cost, Third Party Auditing, Merkel Hash Tree.

## I. INTRODUCTION

There are large number of different types of data are store in the cloud. These amounts of data require strong computation resources and greater storage space [1]. Cloud computing provides an effective way to manage, store and compute large amounts of data and it is beneficial compared to the traditional computing. In the cloud, security and performance are considered as the important factors. The cloud auditing is the major concern in the cloud and integrity of the data in the cloud cannot be effectively guaranteed [2]. Data outsourcing in the Cloud Service Provider (CSP) involves in the series of data security challenges. The biggest challenges of TPA is to guarantee the data integrity in the untrusted cloud [3]. The signature is need to be generated in data blocks before uploading data into the cloud and these signature are later used to check the security of the cloud data blocks. This method is used by the remote data auditing [4].

The efficiency of the traditional methods for checking integrity on the cloud is high and the data present in the cloud is usually larger in size. These methods involve in downloading the entire cloud data to check the integrity and this cost more time and computation, especially when the data is corrupted in the cloud [5], [6]. However, tradition data integrity checking method is not applicable for the cloud because it requires higher cost to store the local data [7], [8]. To protect against the different attacks on the cloud, the researchers proposed a different method from the different aspects. These methods use the non-control data that is difficult to manipulate or difficult to identify in the kernel

[9], [10]. In this paper, different kinds of method involve in the cloud auditing is investigated in the different parameters. The different key update techniques are used for the cloud auditing technique to improve the effectiveness and privacy of the model. The Merkel Hash Tree method provides the considerable efficiency in the integrity check.

The organization of this paper follows, the overview of the cloud auditing is presented in section II, analysis of the different method in cloud auditing presented in section III, a comparative performance analysis is explained in the section IV. The conclusion of this paper is made in section V.

## II. CLOUD AUDITING

Cloud auditing is the important method in the cloud security and there are many techniques available to check the data integrity in the cloud and to improve the security and efficiency. The user needs to generate the signature for the data that are stored in the cloud and the signature is used to authenticate the file blocks. These authenticators are used to verify the data integrity in the cloud [11]. The general function of the cloud auditing is shown in the Fig. 1.

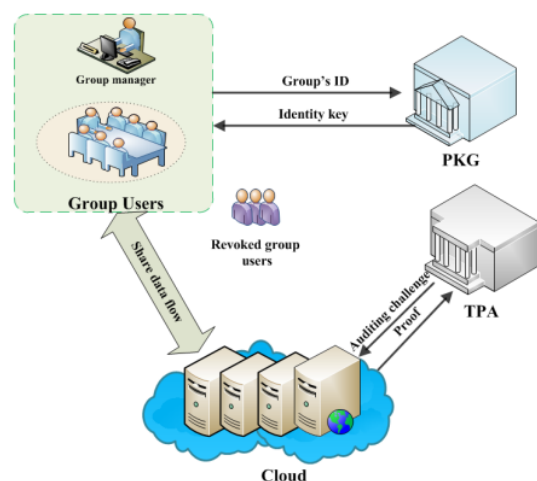


Fig 1. The architecture of cloud auditing in share data [11]

### A Third Party Auditing

The TPA is a fully-trusted party and this helps to verify the integrity of the data in the cloud. The resource storage and computation capacity of the TPA can be considered as unconstrained. Sometimes, the government officials use the TPA to ensure the fairness and impartiality of the TPA [12].