Bull. Mater. Sci. (2022) 45:68
https://doi.org/10.1007/s12034-021-02649-2

SILAR synthesis of SnO_2–ZnO nanocomposite sensor for selective ethanol gas

K S PAKHARE[1,2], B M SARGAR[1,*], S S POTDAR[3], U M PATIL[4] and R D MANE[5]

[1]DIST-FIST Sponsored Material Research Laboratory, Department of Chemistry, Jaysingpur College, Kolhapur 416101, India

[2]Department of Chemistry, Anandibai Raorane Arts, Commerce and Science College, Sindhudurg 416810, India

[3]Department of Physics, Sanjeevan Engineering and Technology Institute, Kolhapur 416201, India

[4]DST-INSPIRE Faculty, D. Y. Patil University, Kolhapur 416006, India

[5]Department of Physics, Jaysingpur College, Kolhapur 416101, India

*Author for correspondence (sargarbalasaheb@gmail.com)

MS received 30 August 2021; accepted 5 December 2021

Abstract. SnO_2–ZnO nanocomposite is synthesized at room temperature using the successive ionic layer adsorption and reaction (SILAR) method. The X-ray diffraction (XRD) patterns of annealed films confirms the formation of SnO_2–ZnO nanocomposite. Scanning electron microscopy depicts the porous agglomerated nanoparticle network-like structure of the SnO_2–ZnO nanocomposite. On the other hand, ZnO has a cauliflower shape, while SnO_2 has a distributed agglomerated nanoparticle-like morphology. Energy dispersive X-ray spectroscopy (EDS) confirms the elemental compositions of composite films. The reducing gases such as liquefied petroleum gas, ethanol, hydrogen sulphide and ammonia were detected using a SnO_2–ZnO nanocomposite sensor. Ethanol has a maximum sensitivity of 56.93% at a temperature of 275°C and a concentration of 24 ppm. In addition, as compared to a bare sensor, a composite sensor responds quickly. The *n–n* heterojunction at intergrain boundaries is responsible for better composite performance over bare sensors. Even at low gas concentrations, the SnO_2–ZnO nanocomposite sensor is found selective towards ethanol.

Keywords. SILAR method; XRD; TEM; porous network-like structure; ethanol sensor.

1. Introduction

The issue of air quality continues to be a significant concern around the world. Our health and the environment both depend on a reliable supply of air. The human nose is a sophisticated detecting organ that can distinguish between hundreds of different odours. Even yet, it fails to detect absolute gas concentrations of odourless gases. As a result, devices are urgently needed to detect hazardous gases to supplement or replace the human nose. There are numerous gas detection methods in use today [1–4]. High-performance gas sensors with high sensitivity, selectivity and response speed are still required to enhance gas detection levels.

Metal oxide semiconducting materials are the most common sensing materials, giving sensors many benefits such as high sensitivity and low cost. It is usually possible to classify metal oxides into (i) non-transition and (ii) transition oxides. The previous (e.g., Al_2O_3) exhibits elements with only one oxidation state because the formation of other oxidation states takes much more energy, while the latter (e.g., Fe_2O_3) contains more oxidation states [5]. Metal oxide semiconductors such as transition-metal oxides could form various surface oxidation states as compared to non-transition oxides. Transition-metal oxides with electronic configurations $d^{0\text{-}10}$ could be used more precisely [6]. Electronic configuration can find the d^0 structure in transition-metal oxides like V_2O_5, TiO_2, WO_3, and d^{10} occurs in post-transition metal oxides (e.g., SnO_2 and ZnO) [7]. Hence post-transition elements metal oxides ZnO and SnO2 were selected for the preparation of SnO_2–ZnO nanocomposite.

Metal oxides, such as SnO_2, ZnO, CuO, V_2O_5, WO_3, and TiO_2, can be utilized to detect combustible, reducing or oxidizing gases [8]. Recently, many research groups focused on nanocomposite materials such as CdO–ZnO, SnO_2–ZnO, ZnO–In_2O_3 for gas sensing applications [9–11]. Tin dioxide (SnO_2) and zinc oxide (ZnO) are widely valuable gas sensing materials. They both are *n*-type materials, and their electrical conductivity depends on the density on the surface of pre-adsorbed oxygen ions. According to their literature survey, the physical and chemical properties of SnO_2 and ZnO are versatile for gas sensing applications.

The synthesis method is also a crucial parameter. The use of SnO_2–ZnO composite materials is a good choice, since it alters the characteristics of materials to increase the

Published online: 07 April 2022

Impact Factor – 1.898

Indexed in – Scopus / SCI

UGC Care II

IF : scopus/SCI/UGC citation index :

frontiers | Frontiers in Public Health

ORIGINAL RESEARCH
published: 25 April 2022
doi: 10.3389/fpubh.2022.885212

Multichannel DenseNet Architecture for Classification of Mammographic Breast Density for Breast Cancer Detection

Shivaji D. Pawar[1,2], *Kamal K. Sharma*[3]*, *Suhas G. Sapate*[4], *Geetanjali Y. Yadav*[5], *Roobaea Alroobaea*[6], *Sabah M. Alzahrani*[6] *and Mustapha Hedabou*[7]

[1] Department of Computer Science and Engineering, Lovely Professional University, Jalandhar, India, [2] SIES Graduate School of Technology, Navi Mumbai, India, [3] School of Electronics and Electrical Engineering, Lovely Professional University, Jalandhar, India, [4] Department of Computer Science and Engineering, Annasaheb Dange College of Engineering and Technology, Sangli, India, [5] NMC Royal Medical Centre Karama, Abu Dhabi, United Arab Emirates, [6] Department Computer Science, College of Computers and Information Technology, Taif University, Taif, Saudi Arabia, [7] School of Computer Science, Mohammed VI Polytechnic University, Ben Guerir, Morocco

OPEN ACCESS

Edited by:
Thippa Reddy Gadekallu, VIT University, India

Reviewed by:
Clement Nyirenda, University of the Western Cape, South Africa
Xiao-Zhi Gao, University of Eastern Finland, Finland

***Correspondence:**
Kamal K. Sharma
kamal.23342@lpu.co.in

Specialty section:
This article was submitted to Digital Public Health, a section of the journal Frontiers in Public Health

Received: *27 February 2022*
Accepted: *14 March 2022*
Published: *25 April 2022*

Citation:
Pawar SD, Sharma KK, Sapate SG, Yadav GY, Alroobaea R, Alzahrani SM and Hedabou M (2022) Multichannel DenseNet Architecture for Classification of Mammographic Breast Density for Breast Cancer Detection. Front. Public Health 10:885212. doi: 10.3389/fpubh.2022.885212

Percentage mammographic breast density (MBD) is one of the most notable biomarkers. It is assessed visually with the support of radiologists with the four qualitative Breast Imaging Reporting and Data System (BIRADS) categories. It is demanding for radiologists to differentiate between the two variably allocated BIRADS classes, namely, "BIRADS C and BIRADS D." Recently, convolution neural networks have been found superior in classification tasks due to their ability to extract local features with shared weight architecture and space invariance characteristics. The proposed study intends to examine an artificial intelligence (AI)-based MBD classifier toward developing a latent computer-assisted tool for radiologists to distinguish the BIRADS class in modern clinical progress. This article proposes a multichannel DenseNet architecture for MBD classification. The proposed architecture consists of four-channel DenseNet transfer learning architecture to extract significant features from a single patient's two a mediolateral oblique (MLO) and two craniocaudal (CC) views of digital mammograms. The performance of the proposed classifier is evaluated using 200 cases consisting of 800 digital mammograms of the different BIRADS density classes with validated density ground truth. The classifier's performance is assessed with quantitative metrics such as precision, responsiveness, specificity, and the area under the curve (AUC). The concluding preliminary outcomes reveal that this intended multichannel model has delivered good performance with an accuracy of 96.67% during training and 90.06% during testing and an average AUC of 0.9625. Obtained results are also validated qualitatively with the help of a radiologist expert in the field of MBD. Proposed architecture achieved state-of-the-art results with a fewer number of images and with less computation power.

Keywords: breast cancer, BIRADS Density Classification, DenseNet, deep learning, multichannel architecture, mammographic breast density

Novel synthesis of perovskite $Gd_xAl_{1-x}O_3$ semiconductor by combustion route for selective LPG sensing

M C NAIK[1], S R BAMANE[2,*], K S PAKHARE[3] and S S PATIL[4]
[1]Department of Chemistry, Smt. Kasturbai Walchand College of Arts and Sciences, Sangli 416416, India
[2]Department of Chemistry, Sushila Shankarrao Gadhave Mahavidyalaya, Satara 412802, India
[3]Department of Chemistry, Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi 416810, India
[4]Department of Physics, Sanjeevan Engineering and Technology Institute, Panhala, Kolhapur 416201, India
*Author for correspondence (sambhajibamane00@gmail.com)

MS received 12 November 2021; accepted 24 March 2022

Abstract. Perovskite $GdAlO_3$ oxides were prepared by a simple and convenient solution combustion method. In synthesis, nitrates of gadolinium and aluminium were used as a precursor and that of urea and glycine was used as a specific fuel for the synthesis of $GdAlO_3$. Nitrates of Gd, Al and urea were taken in proper stoichiometric proportion to synthesize A1, A2 and A3. The obtained $GdAlO_3$ powder was sintered at 850°C temperature. The X-ray diffractometer patterns of samples confirm the formation of polycrystalline $GdAlO_3$ with an orthorhombic structure. The Williamson–Hall plot analysis confirms that the average particle size varies between 20 and 30 nm. The Fourier transform infrared spectral analysis confirms that the synthesized powder itself is phase pure. The field-emission scanning electron microscopy and transmission electron microscopy study reveals porous lump development over the substrate. The elemental composition of the samples was confirmed by energy-dispersive X-ray spectroscopy analysis. The bandgap energy of $GdAlO_3$ was varied between the ranges 3.80 to 3.90 eV. The gas sensing performance of $GdAlO_3$ was systematically examined for LPG, NO_2, NH_3 and H_2S for different operating temperatures and for various concentrations. The $GdAlO_3$ exhibits maximum sensitivity of 20.04% towards 100 ppm of LPG at temperature of 225°C.

Keywords. Combustion method; perovskite $GdAlO_3$; orthorhombic; porous nanoflakes; LPG sensing.

1. Introduction

In today's modern world, detection and monitoring of many hazardous and explosive gases have become key importance as far as air quality and safety of human being is concerned. The recent sensing technologies used solid-state gas sensors on account of their cost effectiveness and possibility of the extensive range of gases over which they can be applied, resulting in an improved air quality [1]. Recently, more research group focuses on new class of materials such as the perovskite type of materials (ABO_3), which has many technological applications owing to their excellent physical and chemical properties and structural diversity, adaptability, etc. These perovskite class of materials shows excellent chemical and thermal stability and hence used as gas and chemical sensors. The structural variety unlocks their path in a wide range of transport properties [2,3]. Additionally, they show exceptional morphological and structural stability, and hence they are more reliable for long-term performance for high-temperature sensor applications. The different forms of perovskite, such as stannates, titanates, nickelates, cobaltates, ferrites, have also been studied for the detection of environmental pollutants. Aono *et al* [4] synthesized perovskite $LnFeO_3$ (where, Ln = Sm, La, Nd, Gd and Dy) powders by carrying the thermal decomposition of heteronuclear complexes, $Ln[Fe(CN)_6]\cdot nH_2O$. The $SmFeO_3$ shows the highest sensitivity towards NO_2 gas. Huang *et al* [5] prepared rare-earth oxides $LaFe_{1-x}Zn_xO_3$ by utilizing sol–gel method. It was observed that, $LaFe_{0.77}Zn_{0.23}O_3$ is more sensitive towards formaldehyde with maximum sensitivity of 44.5 for 100 ppm concentration. Huang *et al* [6] synthesized Ce-doped $BaTiO_3$ nanoparticles by the co-precipitation method and decorated the $Ba_{0.99}Ce_{0.01}TiO_3$ sensor with α-Fe_2O_3. The Fe_2O_3-$Ba_{0.99}Ce_{0.01}TiO_3$ sensor exhibits enhanced gas response towards H_2S, even at very low concentrations of H_2S (400 ppb or lower), with lower operating temperature (150°C) and quick response and recovery time. The performance of perovskite sensors was also enhanced by doping with metal or metal oxide nanoparticles. Xiaofeng *et al* [7] successfully doped palladium ranging from 1 to 5 wt% with $LaFeO_3$ perovskite and applied for the detection of acetone vapors. However, very little work has been reported for $GdAlO_3$ as gas sensors. Xiao *et al* [8] reported $GdAlO_3$-based sensor for NOx and got the highest response of 20.12 nA ppm^{-1} with excellent response and recovery.

Published online: 02 July 2022

Impact factor – 1.898
Indexed in – Scopus / SCI / UGC Care II

ORIGINAL ARTICLE

A C G publications

Org. Commun. 15:1 (2022) 71-80

organic communications

Potassium ferrocyanide promoted an efficient synthesis of benzoxazoles and benzothiazoles under solvent free condition

Vishal S. Patil[1*], Dhanshri V. Patil[2] and Sachin S. Potdar[3]

[1]*Department of Chemistry, Sanjeevan Engineering and Technology Institute, Panhala, Kolhapur, Maharashtra, India, 416201*
[2]*Department of Chemistry, Krishna Mahavidyalaya, Rethare Bk. Karad, Maharashtra, India, 415108*
[3] *Department of Physics, Sanjeevan Engineering and Technology Institute, Panhala, Kolhapur, Maharashtra, India, 416201*

(Received December 03, 2021; Revised March 20, 2022; Accepted March 21, 2022)

Abstract: In the family of heterocycles that includes benzoxazoles and benzothiazoles, there exist compounds with a wide range of biological activity. Because of this characteristic, we designed a moderate and effective technique for the synthesis of 2-substituted benzoxazole and benzothiazole using condensation of aldehyde and 2-aminophenol or 2-aminothiophenol via oxidation of carbon-nitrogen bond. Potassium ferrocyanide catalyzed one-pot synthesis is efficient and provides for quick reaction times, simple set-up and high yields. As a result, we provide here a technique for the rapid solvent free synthesis of benzoxazoles and benzothiazoles. Some synthesized products were identified by ^{1}H-NMR, ^{13}C-NMR and MASS. The role of potassium ferrocyanide as a catalyst is represented by plausible reaction mechanism.

Keywords: Aldehyde; potassium ferrocyanide; benzoxazoles; benzothiazoles; solvent free.

1. Introduction

Benzoxazoles and benzothiazoles are frequent heterocyclic scaffolds in physiologically active and pharmaceutically relevant chemicals and they belong to a large family of molecules. Benzoxazoles are essential scaffolds in natural compounds[1-2] and drug development[3-5]. Benzoxazole compounds with appropriate substitutions have been shown to exhibit a variety of medicinal properties including antibacterial activity[6], antimicrobial[7-10], antiviral[11], topoisomerase I, II inhibitory[12], antitumor activities[13], anticancer agent[14-15] NSC-693638, L-697,661, antiviral[16] and antibacterial[17] UK-1, AJI9561. According to recent research, substituted 2-benzylbenzoxazoles exhibit antibacterial, antifungal[18], antimicrobial[19-21] and anti-measles virus[22] properties (Figure 1).

The tiny and simple benzothiazole nucleus is found in compounds with intriguing biological properties such as anticonvulsant[23-24], antimalarial[25], antitubercular[26], antimicrobial[27-28],antitumour[29-32], anthelmintic[33], anti-inflammatory, analgesic properties[34]. The benzothiazole ring may be found in a variety of natural substances, both marine and terrestrial, that have significant biological activity. Many natural products, such as epothilone-A, lyngbyabellin A, dolastatin 10 & bleomycin, include thiazole nucleus molecules[35]. The synthesis of these molecules is of significant interest due to their substantial medicinal value. Riluzole is a benzothiazole derivative-containing medication used to treat amyotrophic lateral sclerosis. In certain patients, it may postpone the need for a tracheostomy or a ventilator and it

*Corresponding author: E-Mail: vishalpatil.chem@gmail.com

The article was published by ACG Publications
http://www.acgpubs.org/journal/organic-communications © January-March 2022EISSN:1307-6175
DOI:http://doi.org/10.25135/acg.oc.121.2110.2242
Available online: March 27, 2022

Indexed in Scopus / SCI / UGC Core II
Impact factor — 0.81

Conference Paper

Design and Analysis of a Gearless Multi-Angled Transmission System Employing a Variety of Materials

December 2022

Conference: 2022 IEEE North Karnataka Subsection Flagship International Conference (NKCon) · At: Karnataka

Authors:

Gajanan Koli **Chandrashekhar** **Vidya Sagar Battula**

Gowthaman K S **Raffi Mohammed** **T Vijay Muni**

Venkata Kishore

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:07/July-2022 Impact Factor- 6.752 www.irjmets.com

AC SOLAR GENERATOR WITHOUT INVERTER

Vaishnavi Bhalkar[*1], Vasudha Gurav[*2], Bhakti Valake[*3], Vishwajeet Patil[*4], Abhijit Ghatage[*5], N. S. Jadhav[*6]

[*1,2,3,4,5]Student, Electrical Engineering, Sanjeevan Engineering and Technology Institute, Panhala, Maharashtra

[*6]Professor, Sanjeevan Engineering and Technology Institute, Panhala, Maharashtra

ABSTRACT

Today, a greater part of the world's energy needs are met by petroleum products and as the worldwide energy utilization increments definitely so does the utilization of petroleum products. Be that as it may, petroleum derivatives being a non-sustainable asset is nearly consumption and subsequently emerges the requirement for the utilization of sustainable power assets. The task attempted, advances an inventive method for creating power from sun oriented energy utilizing sun powered chargers by straight forwardly producing AC power, not at all like the regular frameworks which creates DC power which must be further on changed over to AC. This new framework, eliminates the requirement for inverters and stage synchronizers, the misfortunes brought about by the influence electronic converters and need for batteries. Making the framework more savvy, effective and pragmatic. The framework utilize a array of photovoltaic cell pairs which are associated in antiparallel structure to make an AC wave structure. The frequency of the AC output created by these cells as they are on the other hand covered and presented to sun powered rate under a turning plate can be controlled, by just controlling the speed of the motor used to rotate the disc.

Keywords: Solar, AC Power, Disk, Photovoltaic, Frequency

I. INTRODUCTION

The necessity of environmentally friendly power is expanding as the overall environment is changing step by step. Coal and other petroleum derivatives are likewise restricted and they will at last run out. The hydroelectric power can be a restricted wellspring of energy it must be utilized in places with gigantic water assets. Then, at that point, thermal power can likewise be utilized for the generation of electricity yet it can make atomic waste so it isn't ecological cordial. However, the utilization of clean sustainable power as sun oriented energy is conceivable. It is an ordinary asset of clean energy as sun sparkles wherever in the planet. So it is not difficult to change over sun oriented energy into power utilizing a sun based cells. Sun based power is expected to turn into the world's biggest wellspring of power by 2050, with sunlight based photovoltaic and concentrated sun oriented power contributing 16 and 11 percent to the worldwide generally speaking utilization. A Photovoltaic cell is comprised of a semiconductor material like silicon. It retains the daylight and produces power. Electron can stream in a one heading through a solar cell on the grounds that the terminals (positive and negative) of the solar cell are static. That is the reason solar cell can create direct current (DC). The essential issue with sunlight based power age is that, sun powered chargers today produce DC power which must be changed over to AC as a larger part of the electrical gadgets can utilize alternating current (AC). The cost of sun powered chargers joined with the cost of inverters, stage synchronizers, establishment and support has made the cost of sun oriented restrictive. Add to that the deficiency of force from the various parts utilized in the DC to AC transformation cycle and it becomes much more ugly. Today, AC power is created for the power lattice by AC generators. The generators are controlled by mechanical energy given by water turbines or steam turbines, flammable gas or atomic fuel. The mechanical energy turns the curls of the generator in an attractive field to deliver voltage. Since the guide loop of the generator flips heading during revolution in the attractive field the subsequent voltage delivered is sinusoidal or AC. This venture disposes of the issue of switching DC over completely to AC. It utilizes sun powered as its feedback and with the assistance of an motor disc arrangement it changes over the DC force of sun oriented cells straightforwardly to AC without utilization of any transformation gear. The coming about yield voltage is hence sinusoidal or AC. In this manner there is no need of transformation hardware's like inverters, stage synchronizers and so forth. This makes the general idea very basic yet successful and affordable as well. And, these sunlight based AC power generator exhibits can undoubtedly supplant the power establishes today, simultaneously being nature well disposed, they can be found any place like in a playground, school or in any private or in any metropolitan environmental

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:07/July-2022 Impact Factor- 6.752 www.irjmets.com

elements. Enormous scope sun based AC power generator exhibits can without much of a stretch be put in any remote spot.

II. RESEARCH OBJECTIVE

The essential goal is to take out the need of the converter frameworks which incorporate power electronic parts also, consequently failures achieved by this additional instrumentation which at present is vital for change of the DC outout of the solar system to an AC system. The Solar AC Generator can give a similar outcome at lower cost and with even less energy misfortunes by simply creating rotating current straight forwardly from sunlight based cells without utilizing additional hardware. In this manner making sun powered energy a practicable, modest, ecological well disposed for business and homegrown use. Furthermore, making it capable to be used in both the small or large scale by suitable spacing solar ac generator.

III. LITREATURE SURVEY

Head servant David M [1] planned the sun powered convertor for producing the variable plentifulness exchanging current waveforms straightforwardly from the sun based energy. A multi-sided high velocity, turning and light focusing curved reflect framework gives light on and past the weighted sections of the photograph voltaic bank to deliver immediate result which are corresponding to the quantity of cells examined in each fragment. Steward isn't effectively versatile to deliver bigger voltages/amperes nor is it somewhat upkeep free.

Jorge Ford [2] planned a convenient gadget that creates AC electric energy. Sunlight powered chargers are connected to vanes that are mounted on a turning shaft that is impelled by a DC engine. At the point when the boards pivot a fluctuating, or rotating, voltage is created. Gadget need contact brushes and wiring to produce the substituting flow power.

Jason Allen Oliver [3] found a technique to create AC power straightforwardly from the sunlight based charger. He utilize a variety of photovoltaic cell coordinates that are each associated in enemy of lined up with structure a/c intersection. Board uncovered and conceals photovoltaic cell matches to daylight to produce substituting flow power at a/c intersection of the sunlight based cell matches

The current innovation is a framework, gadget and strategy for straightforwardly creating exchanging flow power from photovoltaic cells. The framework, gadget and strategy precisely progressively uncovered and conceals photovoltaic cell pairs associated in antiparallel with daylight to create exchanging flow power at an AC intersection of the sun oriented cell pairs. Progressively and on the other hand uncovering and concealing the two antiparallel connected solar cell of each sun based cell pair causes the adequacy and extremity of the power at the AC intersection to progressively rise and tumble to create exchanging current power. The progressive, exchanging openness and concealing of the two antiparallel solar cells is achieved by precisely covering and uncovering the sun oriented cell pairs. Specifically, while one sun oriented cell of an antiparallel associated sun based cell pair goes through progressive openness to daylight from 0% openness (100 percent concealed) of the sun oriented cell power creating region to 100 percent openness (0% concealed) of the sun oriented cell power producing region, the other sun based cell of the sun powered cell pair goes through continuous concealing from daylight from 0% concealed (100 percent openness) to 100 percent concealed (0% openness). Such progressive, exchanging openness and covering of each sun oriented cell of each antiparallel associated sun based cell match is occasional. The pace of openness and concealing decides recurrence. In one structure, a turning plate arranged over the sun oriented cell pairs has divided separated openings framing covers between each opening to on the other hand uncover and conceal the sun oriented cell pairs during revolution. An direct current engine is used to turn the disc . The motor is ideally controlled by independent sun oriented cells. The current development likewise gives a stage synchronizer to keeping an ideal alternating current frequency. The stage synchronizer controls the motor to control revolution of the disc.

IV. COMPONENT USED

1) Base

We utilized wood sheet as base which is a non-directing material. The sun based cells are organized in a circle on the surface of the base [4]. Furthermore, the motoris at the focal point of base which is turning the turning plate. To help the upper circle a few rollers are likewise fixed on the base.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:07/July-2022 Impact Factor- 6.752 www.irjmets.com

2) Rotating Disc

Fig 4.1: Rotating disc

A non-flexible plate having same or more widths then the sun based cell cluster which covers the entire sun powered cell exhibit and it can uncover and obstruct the daylight. The plate ought to be of a lightweight material with no versatility so it can undoubtedly turn . The plate has 6 openings. The size what's more, state of the openings is same as that of the photovoltaic cell exhibit to control openness of photovoltaic cell to the daylight when the openings are put over the sun oriented cell. Rest of the sheet is utilized to cover a sun oriented cell totally at the point when the opening isn't over the sun based cell.The openings are situated at around 60˚ from one another. The number of openings is 6 with the goal that the quantity of covers is a portion of the quantity of photovoltaic cells. Thus, when the plate is put on the casing over the photovoltaic cell cluster, a big part of the sun powered cell cluster region is uncovered and a big part of the sunlight based cell exhibit region is covered [4]. At the point when the plate pivots over the variety of sunlight based cells, it will gradually and continually covers and uncovered the variety of photovoltaic cells by the patterns and covers. Subsequent to planning the base, pivoting plate and making all the associations, the AC sun based generator seems to be displayed in figure beneath .

3) DC Motor

A DC motor that is upheld by the base pivots the plate over the base comprised of sun powered cell cluster. Pivot can be toward any path clockwise or anticlockwise. Pivot of the plate causes the patterns to cover and uncover the adjoining on the other hand photovoltaic cells. The frequency of the sign depends on the speed of the turning disc. Quicker the photovoltaic cells are covered and uncovered, the higher the frequency of AC power created as well as the other way around .Variable power supply to motor.The variable power supply is utilized to supply the DC voltages to the DC motor which will then pivot the plate to create AC waveform.

V. ARRANGEMENT AND CONNECTION OF PANEL

A couple of sun powered cells A and B is displayed in the Figure (c). To create an AC yield wave the sun oriented cell pair is associated in antiparallel. The adverse terminal of the photovoltaic cell A is associated with positive terminal of the photovoltaic cell B, though the adverse terminal of the sun powered cell B is associated with the positive terminal of the photovoltaic cell A.The sun oriented cell pair ought to be associated as displayed in the figure (c).The AC output terminals are Aout and Bout.To increment the current and keep up with the steady voltage, the sun based cells shown are associated in parallel. To increment voltage and to keep up with steady current, sun based cells would be associated in series

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:07/July-2022 Impact Factor- 6.752 www.irjmets.com

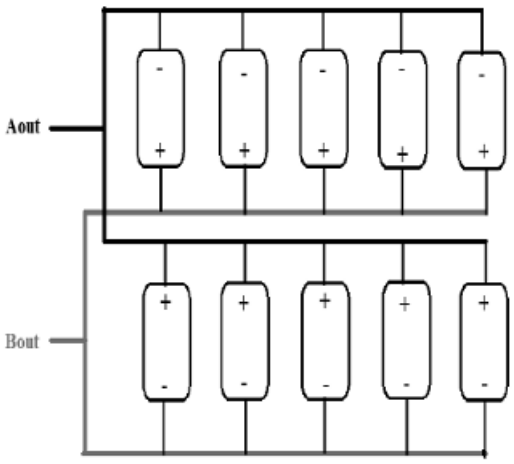


Fig 5.1: Arrangement of solar cells

A array of solar cells is associated for AC sine wave .The sun powered cells on the upper side are addressed by solar cells.A1, A 2, A3, A4, and A5 are coupled to frame the single AC output terminal Aout, while the excess sunlight based cells addressed by sunlight based cells B1, B2, B3, B4, and B5 are coupled so they can frame the single AC output terminal Bout consequently framing a "photovoltaic cell pair". Each sun oriented cell sets of them has the first and second AC output is associated in antiparallel to resemble single AC output. So one result terminal would give the single stage AC power.

VI. WORKING

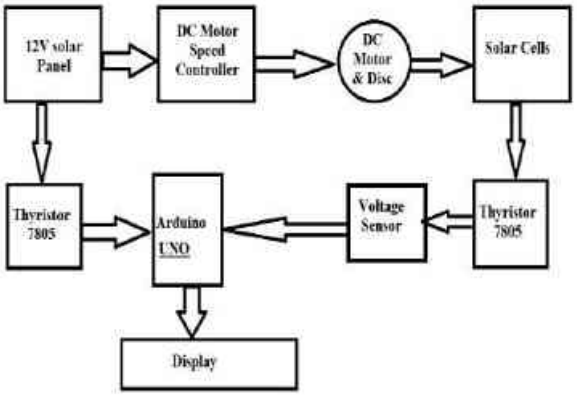


Fig 6.1: Block diagram

In this system, an even number of solar panels connected in anti-parallel are arranged circularly over a base, which is a non-conducting material. Solar cells are placed in a circular form so that the pair of anti-parallel connected photovoltaic cells of each photovoltaic cell pair progressively and alternately get exposed and shaded causing the amplitude and polarity of the waveform at the AC output to slowly and steadily rise and fall to make alternating current. A motor (preferably dc motor) fixed at the center of the base is used for rotating the upper disk. And, the disk can rotate in either direction that is, clockwise or anticlockwise. The direction of rotation of the disk depends on the polarity of the motor. The upper disk consists of slots, the number of slots being half the number of panels. And hence, the pair of photovoltaic cells pair progressively and alternatively get exposed and shaded causing the amplitude and polarity of the waveform at the AC output to slowly and steadily rise and fall to make alternating current.

Existing innovation requires sun powered energy to be changed over from direct current (DC) to exchanging current (AC) before it is viable with the country's power network. This technique for producing AC power straight forwardly sun based energy tries to accomplish a similar outcome at a lower cost and with less energy misfortune by creating rotating current as opposed to depending on extra gear . In this framework, a significantly number of sunlight powered chargers associated in antiparallel are organized in round way over a wooden base, which is a non-leading material. Sunlight based cells are put in around structure so the sets of

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:07/July-2022 Impact Factor- 6.752 www.irjmets.com

antiparallel associated photovoltaic cells of each photovoltaic cell pair dynamically and on the other hand get uncovered and concealed causing the sufficiency and extremity of the waveform at the AC result to gradually and consistently rise and tumble to make alternating current. A motor (ideally dc motor) fixed at the focal point of the base is utilized for turning the upper plate.Furthermore, the circle can turn in either heading that is, clockwise or anticlockwise. The bearing of turn of the plate relies upon the extremity of the engine. The upper plate comprises of spaces, the number of openings being around 50% of the quantity of panels. Furthermore, subsequently, the sets of photovoltaic cell pair logically and on the other hand get uncovered and concealed causing the abundancy and extremity of waveform at the AC output to gradually and consistently rise and tumble to make alternating current.

VII. RESULT

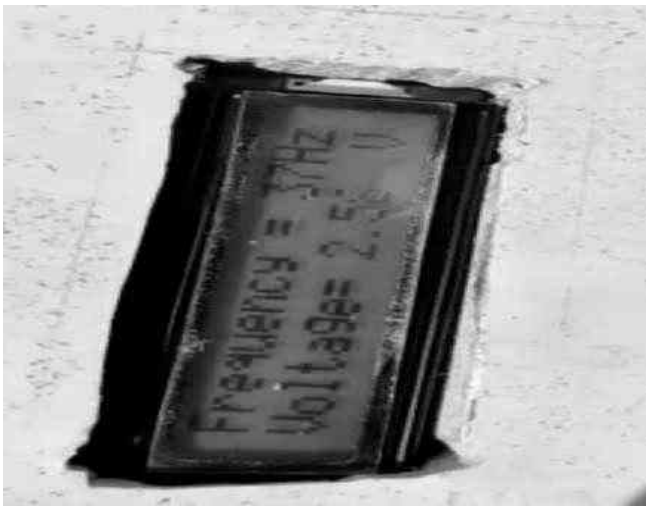


Fig 7.1: output of project

Frequency is impacted by just speed of the rotor. As speed increments, frequency increments as well as the other way around. Frequency of the result power can be estimated either by multimeter or by DSO. Toward the finish of trials, a frequency of 37.00Hz was gotten.

VIII. CONCLUSION

Taking into account the steadily expanding request of power,it has turn into a need of an hour to support the utilization of sustainable well springs of energy. Taking into account their benefits of minimal expense per unit of age, less upkeep, dependability, and so forth these sustainable power sources are the best option for the presently being used non-inexhaustible wellspring of energy for power age which are dreaded of becoming terminated in close future. AC SOLAR GENERATOR gives one such arrangement.

IX. REFERENCES

[1]. Jason Allen Oliver, “Device, System And Method For Directly Generating AlternatingCurrent Electricity From Photovoltaic Cells ”,17 Jul 2012 International Journal of Engineering Research in Electrical and Electronic Engineering (IJEREEE) vol. ED-11, pp. 34-39.

[2]. Muhammad Aziz Ul Haq, Hifsa Iram, Azaz Ul Haq, “Smart Solar AC Genera- tor without Inverter”, 10-11 June 2015, International Standard Book Number (ISBN) ISBN-978-1-4673- 6812-4.

[3]. Rahul B Gaikwad, “AC Power Generation Using Solar Panel ”,International Journal of Engineering Research in Electrical and Electronic Engineering (IJEREEE) Vol. 4, Issue 3,March 2018.

[4]. Parate Anand P,“AC Power Generation Using Solar Panel”, International Journal for Scientific Research & Development—(IJSRD) Vol. 4, Issue 04, 2016 — ISSN (online): 2321- 0613 .

[5]. Bhushan Paraskar, Preheat Gawai, “Practical Model for Solar AC Generation”, Technical Research Paper Competition for Students (TRPCS2K17), 23 March 2017.

[6]. Reference Book:-B. L. Theraja, A. K. Theraja, Textbook of Electrical Technology”, AC and DC Machines, vol. 2, pp. 15471548, Nov. 2011, S. Chand Publications.

International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 07 | July - 2022 Impact Factor: 7.185 ISSN: 2582-3930

Digital Smart Pen

Akshay Vilas Aswale[1], Abhijit Balaso Kumbhar[2], Mayuresh Mohan Desai[3], Aditya Sudhir Shigavkar[4], Abhishek Bhaskar Mane[5], Prof. Y. R. Naik[6]
Student, Electrical Engineering Sanjeevan Engineering & Technology Institute[12345] Professor, Electrical Engineering Sanjeevan Engineering & Technology Institute[6]

Abstract: The purpose of education and learning is often defeated when gadgets developed to assist in the process of learning is not user friendly or ends up becoming a distraction in the classroom due to its size. This work intends to describe a gadget known as smart pen which is a new and evolving technology that does not create distraction due to its portability, that is user friendly and above all its affordable nature. Just like any other pen, it is a writing device developed by the livescribe company. It is a digital and intelligent pen that is fast gaining recognition in synchronizing written notes.

I Introduction

Smart pen is a more specific term; it has the same basic characteristics, but also has other features like voice recording or a text scanner. Digital pens typically contain internal electronics and have features such as touch sensitivity, input buttons, memory for storing handwriting data and transmission capabilities. A digital pen is an input device which captures the handwriting or brush strokes of a user and converts handwritten analog information created using "pen and paper" into digital data, enabling the data to be utilized in various applications. This type of pen is usually used in conjunction with a digital notebook, although the data can also be used for different applications or simply as a graphic. we talk about an increasingly common writing technology called Smart pen. Being one of the latest and useful gadgets on the market today, this practical tool's only purpose is to make our life easier. It is small and compact, it is helpful in more than one way and it can be used by just about anyone.

The Live scribe Echo Digital Smart pen is a very ingenious pen that notonly can write but records too. This pen not only writes like any other pen but it also hears and keeps the information we know that is important and do not want to forget. Recording is done by simply tapping the record button in the notebook to start and tapping again to stop. Through the standard cable it is possible to connect the pen to the computer, which passes all the recordings and also turns possible the search to find both verbal and written notes "Digital pens also called smart pens are made of internal electronics with touch sensitivity, input buttons, transmission capabilities, and also memory for storing handwriting data. With such features, it's able to convert handwritten data into digital data . "Digital pens are usually connected to the computer or pads via Bluetooth or USB cables, they offer more functions compared to a stylus. The sensors fit in the digital pens to detect motion and then translate the motion into graphics, art or writing. Mostly used by graphic designers to make drawings and sketches on their computers while for some students they take notes using digital pens." "Digital pens have features like touch sensitivity, memory, input buttons and electronic erasing capability. A digital pen can be used to write on digital paper, and once done, the user can save what has been written. The pen usually vibrates or beeps as a sign of confirmation that the user has finished a page and the work has been saved. Most digital pens save handwritten work as images in the commonly used GIF or JPEG format. Some, however, use a proprietary format. There are various types of digital pens available on the market like the trackball pen (with a sensor attached to detect the motion of the trackball), camera pen (with camera attached), positional pen (to detect the position of the tip) and active pen. All of these have some special features to differentiate them." "Live scribe's Smart pens are also audio recorders so that students can capture the lectures with their notes. By pointing the Smart pen to their writing or drawings on the digital paper, they can play back the lecture they were listening to when they made those entries. " "An electronic ballpoint pen that digitizes, stores and transfers what is written or drawn to the computer. Instead of a mouse, a digital pen

provides a very natural way to hand write and hand draw into the computer. In addition, since it stores everything internally, the data transfer to the computer via wireless or USB can be done at a later time. Digital pens may also include audio recording "

II Literature Survey

People started to use goose feather for writing, then passing through the pen cartridge and reaching the simple ball pen, the way people wrote had passed through a major evolution. It is now possible to have a pen with more features than the simple writing. The company called Live scribe , which was founded by Jim Marggraff, had developed a tool that can be used by any person. For that, it was based on the model of a normal pen, making then a new redesign and adding some electronic features. By this way, it was created a multifunction writing tool called Smart Pen. This innovative pen is considered the most significant evolution that has happened to the regular pen since the advent of the computer.

It contains a small OLED display which shows the user the information about what had been written and what had been stored or collected from an application. This idea came up when Jim Marggraf was still working at the Leapfrog company and after he had developed the Fly Pen, which was technically impressive and with computerized devices. However, this new pen was not commercially attractive, resulting in its failure due to the need of a special paper (Fly Paper) so the pen could read what was being written.

Reading is important in today's life. Printed text is everywhere in the form of receipts, bank documents, reports, books. There are many systems done text to speech conversion, but they can't handle product labeling. But big limitation is use of this is difficult for blind people. This paper proposed camera based text reading to help blind peoples to read the product label. Main prototype of this system is 1) Novel based algorithm to solve aiming problem. 2) Novel algorithm ofautomatic text localization to remove the background of the text image. 3) Camera based framework used for binned people to read text.

S. Neha Vimala, M. Veda Chary and K. Ravi Kiran Having an effective video surveillance system is not only beneficial but also adds a sense of surety and comfort to the user 1 .There maybe no better reassurance than having a visual proof. Video monitoring and surveillance have now become much affordable to an average user, With widespread technologies providing great usability . Modern day technology offers devices which are easy to install and convenient to handle. Hence, managing and monitoring the behavior in spaces like homes, supermarkets, factories, hospitals, hotels, banks, and schools etc. has become much easier for the user, also providing far-flung accessibility. Earlier, video surveillance came with bulky set up which was only confined to larger spaces, and conventional set up involved CCTV cameras. Efficient use of the technology and resources can reduce all this hassle. The main aim of the proposed design is to offer easy surveillance of an area, to a distant user via live video streaming on the VLC media player over LAN/WLAN 3. Raspberry Pialong with a night-vision camera module is used in designimplementation . The code for programming the Raspberry Pi and initiating the live. broadcast to the VLC media player is written using Python programming language. Further, Virtual Network Computing is employed to establish remote connections between Raspberry Pi set up and the host device, for remote accessibility over a Local-Area Network .

Aditi Shrikant Jadhav 1 , Prof. Sudarshan R. Diwate Embedded Real-time video monitoring system is designed, in which the embedded chip and the programming techniques are used. The central monitor which adopts Raspberry pi is the core of the whole system. Real time video transmission is widely used in surveillance, conferencing, media broadcasting and applications that include remote assistance. Network video capture system using Raspberry pi is presented.

Dr. G. G Sivasankari Nowadays, closed circuit television for security and peace purpose for people. The traditional system has the several disadvantages such as inconvenient to carry, anomalies cannot be detected, storage space needed is more, and cost remains high. This paper provide the design and implementation of the technology called

Live video streaming using Raspberry Pi in IOT devices, with a single board computer which computes the Motion Detection Algorithm written in python as programming environment. The system uses the algorithm to significantly decrease the storage space and to save the cost. The algorithm is implemented on the Raspberry Pi, which provide the live streaming with motion detection. The live steaming can be viewed from any web browser or even from mobile in the real time.

III Proposed system

It has been employed for video broadcasting. Pi No IR camera V2 module is night vision camera module custom designed add-on for Raspberry Pi8. It is connected to the Raspberry Pi's camera port through a CSI bus which is the Camera Serial Interface; its designated use is to interface the cameras. Key features include: Night vision. (does not employ an infrared filter), Fixed-focus lens for high-quality imaging, 8-megapixel native resolution sensor capable of 3280 x 2464 pixel static images, and Supports 1080p30, 720p60 and 640x480p90 video. The Pi camera is connected to the Raspberry Pi 3 board and powered up. It is then enabled on Raspberry Pi GUI. Once this is done, the Pi camera delivers high-quality imaging when commanded. And being a night vision camera, it is also perfect for low light photography.

Raspberry Pi is a series of small single-board computers (SBCs) developed in the United Kingdom by the Raspberry Pi Foundation in association with Broadcom. The Raspberry Pi project originally leaned towards the promotion of teaching basic computer science in schools and in developing countries. The original model became more popular than anticipated selling outside its target market for uses such as robotics. Itis widely used in many areas, such as for weather monitoring, because of its low cost, modularity, and open design. It is typically used by computer and electronic hobbyists, due to its adoption of HDMI and USB devices.

Raspberry Pi 4 Model B was released in June 2019 with a 1.5 GHz 64-bit quad core ARM Cortex-A72 processor, on-board 802.11ac Wi-Fi, Bluetooth 5, full gigabit Ethernet (throughput not limited), two USB 2.0 ports, two USB 3.0 ports, 2-8 GB of RAM, and dual-monitor support via a pair of micro HDMI (HDMI Type D) ports for up to 4K resolution. The version with 1 GB RAM has been abandoned and the prices of the 2 GB version have been reduced. The 8 GB version has a revised circuit board. The Pi 4 is also powered via a USB-C port, enabling additional power to be provided to downstream peripherals, when used with an appropriate PSU. But the Pi can only be operated with 5 volts and not 9 or 12 volts like other mini computers of this class. The initial Raspberry Pi 4 board has a design flaw where third-party e-marked USB cables, such as those used on Apple MacBooks, incorrectly identify it and refuse to provide power. Tom's Hardware tested 14different cables and found that 11 of them turned on and powered the Pi without issue. The design flaw was fixed in revision 1.2 of the board, released in late 2019. In mid-2021, Pi 4 B models appeared with the improved Broadcom BCM2711C0. The manufacturer is now using this chip for the Pi 4 B and Pi 400. However, the tack frequency of the Pi 4 B was not increased in the factory.

It can contain the following components: it is the controlling peripherals.

- Power supply – It is an electrical device that cans supplies the electrical power.5v supply isused in that.
- Ethernet – It is used to access the e-dictionary website.
- camera –This is used for capture the image
-

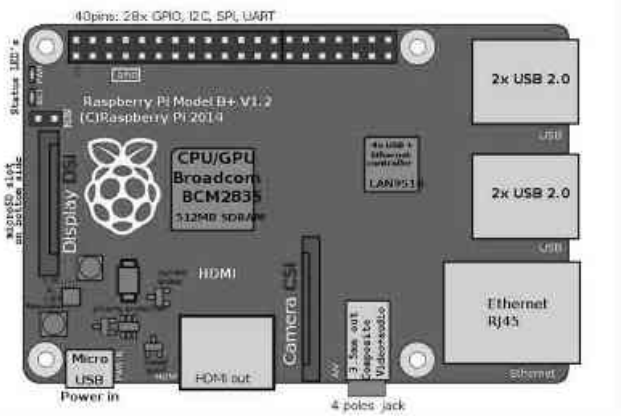


Fig.1 Raspberry Pi Circuit

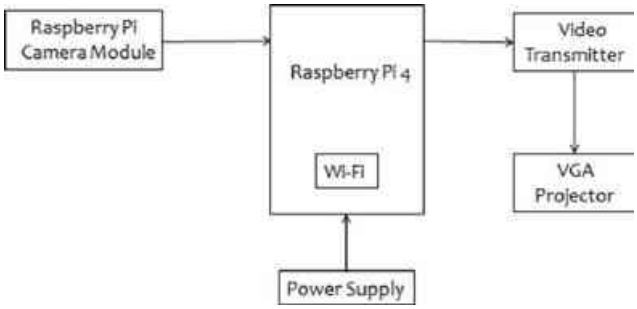


Fig.2 Block Diagram

- Raspberry pi –This project has been built around Raspberry pi B+ processor board.
- Speaker –It is used to listen the text on the image.

The Motion Detection algorithm works on principle of the frame differencing, Comparing that change of pixels' value from one frame to another and also for object change in image. The Problem with this detection algorithm is it neither detect the slow moving object, because of sensitivity in the threshold, if it is too low and it detect like shadow and the image change in thesunlight. This algorithm is not able to handle rotating object.

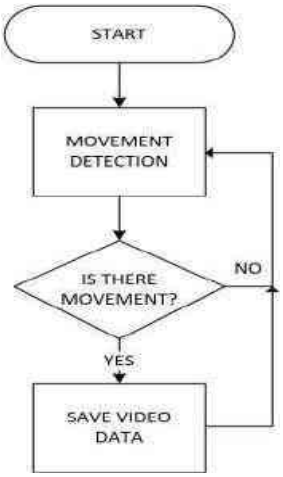


Fig.3 Flow chart

IV Experimental results

The proposed design uses Raspberry Pi 3 board and Raspberry Pi NoIR camera V2 module as primary components in system execution. Raspberry Pi uses Raspbian operating system and is programmed in Python, which is a powerful yet

easy-to-use programming language that allows connecting the system to the realworld. Execution process begins with initially booting up the Raspberry Pi. A 16GB micro SD card is given a proper format using SD Formatter and setup with latest Raspbian OS. To do so, the Raspbian OS is

downloaded from Raspberry Pi's official website in Zip file format. The downloaded files are then extracted to the micro SD card, after which it is inserted into the SD card slot on the Raspberry Pi. The Raspberry Pi is now plugged into a monitor via HDMI adaptor cable; input connections like

keyboard and mouse are properly established and powered up using a2.5A micro.

USB power supply or an equivalent battery pack. Once the Raspbian operating system is installed, the initial boot completes. The Raspberry Pi is then connected to the internet over LAN/WLAN and Pi's IP address is fetched; camera interface, as wellas VNC server, is

Fig.4 Initiating the live stream

enabled. In order to establish the remote connections over VNC server, the user needs to sign up for the service by providing working email address and a secure password for authentication. Now that the VNC server is setup. VNC viewer is downloaded on the host device for accessing the Raspberry Pi's desktop remotely. The VNC server creates a virtual desktop onto the VNC viewer which only exists in Raspberry Pi's memory.

Fig.5 Connections and Setup for Initial Boot.

The below presents the screenshots of the system. Here the control panel with control option to save the file which is used for capture of picture some change in video resolution. When some movement occur it analyses the incoming image and store important items, and here we can view the JPEG images and video will be played smoothly even we can watch on mobile with good reliable performance. While remotely can view in the 640x360 MJPEG image, the Raspberry Pi reports 67%CPU without overlocking.

Fig.6 Projector Setup

V Conclusion

An approach for the video surveillance monitoring system with the Motion Detection algorithm to decrease the cost as well as the storage using a raspberry pi as single board computer was propose in paper. But it is far from the final version and need to improve a lot. In Future we can improve with the threshold value which can be used in the Motion Detection Algorithm. The performance can be enhanced to certain condition .If we have the some good threshold value and algorithm can detect the object whichare moving and include slow or tiny object. Through this paper, the design and implementation of a simple yet powerful live video surveillance system are illustrated. Ease-of-access to modern-day gadgets increased user's dexterity with technology. Prioritizing the need for easily programmable, cost-effective piece of technology; this design employs Raspberry Pias the primary module for the job. Python programming language makes it viable for connecting this system to the real world. On the whole, this system reduces the intricacies of setting up a standard real-time

monitoring system over an online network.

References

[1] http://downloads.raspberrypi.org/raspbian_latest

[2] http://sourceforge.net/projects/win32diskimager/files/latest/download

[3] D.Velmurugan, M.S.Sonam, S.Umamaheswari, S.Parthasarathy, K.R.Arun [2016]. ASmart Reader for Visually Impaired People Using Raspberry PI. International Journal of Engineering Science and Computing IJESC Volume 6 Issue No. 3.

[4] Yong-ik Yoon, Jee-ae Chun, Tracking System for mobile user Based on CCTV. Information Networking(ICOIN),2014 International Conference on, Phuket, 10-12 Feb. 2014, pp. 374-378.

[5] Viren Pereira, Vandyk Amsdem Fernandes, Junieta Sequeira, Low Cost Object Sorting Robotic Arm using Raspberry Pi. Global Humanitarian2014 IEEE TechnologyConference - South Asia Satellite.

[6] New Raspberry Pi 3 (2016) Review-Unboxing and Tutorial.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

SOLAR-WIND HYBRID ENERGY SYSTEM FOR DC LIGHTNING

Shubham Narke[*1], Kunal Gavali[*2], Pradip Kadam[*3], Aditya Bhosale[*4], Pradeep Dange[*5], Yogesh R. Naik[*6]

[*1,2,3,4,5]Students, Sanjeevan Engineering & Technology Institute, Panhala, Maharashtra, Sanjeevan Engineering & Technology Institute, Panhala, Maharashtra, India.

[*6]Professor, Sanjeevan Engineering & Technology Institute, Panhala, Maharashtra, Sanjeevan Engineering & Technology Institute, Panhala, Maharashtra, India.

ABSTRACT

Now days energy demand is continuous Increasing because of population growth, Advancement in technology. The conventional Sources are available in limited manner & they Have adverse effect on the environment. Whereas non-conventional sources available Naturally with free of cost & does not have any Adverse effect on the environment. In proposed system we have implemented "Solar Wind Hybrid Energy System for DC Lightning." This system is mainly applicable for residential or commercial application, in the remote areas, in hilly areas where electricity is not available.

I. INTRODUCTION

Hybrid system means electricity generation by using two or more sources. The generation of electrical energy by using solar and wind energy called solar wind hybrid system. As we know availability of energy changes as Seasons changes. In summer Seasons there are maximum availability of sun rays and in a rainy or winter Seasons there are maximum availability of wind energy. The availability of energy also changes with day, means at the day time maximum availability of sun energy and at the time of evening maximum availability of wind energy. The generation of electrical energy by using only one system either through solar energy or through wind energy does not provides that much reliability. As if we use hybrid system it provides reliable system. In Proposed system in summer seasons maximum energy generated through solar system whereas in rainy or winter Seasons maximum energy generated through wind system. In such way this system provides reliable supply throughout the year. Now a days energy demand is continuously increasing because of a population and advancement in the technology. now a days most of energy generated through the conventional energy sources. But their availability Limited in nature and they are at the exhausting phase they produce pollution and having adverse effect on the environment. Whereas renewable energy available in abundant manner with free of cost in the environment, they are eco -friendly and does not produce any pollution and don't have any adverse effect on the environment. So Renewable Energy Sources are best choice for the generation of electrical energy.

II. METHODOLOGY

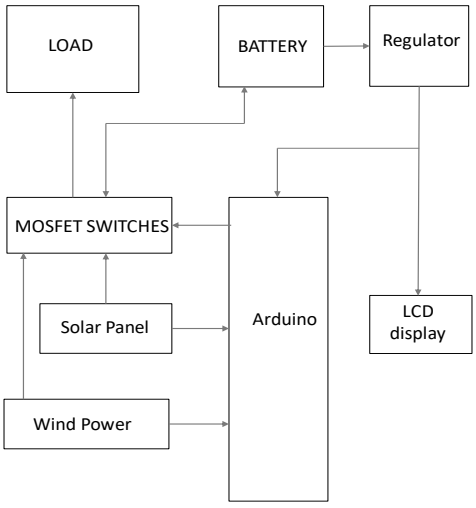


Fig 1: Block Diagram of Selector Circuit Hybrid system.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

In proposed system we have Arduino based selector circuit which select source of electrical power generation. The Arduino of at mega 168 has both a physical programmable circuit board & integrated development environment that runs your computer with the help of this we can write the computer code to physical board. Arduino Uno has total 28 pins, 14 digital input /output pins out of that 6 can be used for PWM output and it has 6 analog inputs. And 16 MHz crystal oscillator, with USB connection, power jack and reset button.

HARDWARE IMPLEMENTATION

Solar: Solar Panel has specifications as follow

Table: configuration of solar panel

Rated maximum power	Pmpp	50W
Open circuit voltage	Vac	21.77V
Short circuit current	Isc	3.04A
Rated voltage	Vmpp	17.89V
Rated current	Impp	2.8A

Wind Mill: Wind Mill has following specifications

Table: configuration of wind mill

Rotation Axis	Vertical
Model	3 phase BLDC Motor
Wattage	350 watts
Height of wind mill	6ft
No. of Blades	3
Blade Height	22 inches
Max Output voltage	24V
Max speed	28 Km/hr

Charge Controller:

Charge controller has current rating of 10 A and constant output voltages of 12 V or 24 V. charge controller perform the function of extract maximum energy from solar panel & avoid over charging and discharging of battery, because at night time panel voltage is less than battery voltage. in that case there is possibility of flow of current from battery to solar panel in order to avoid this we have used charger controller. Charge controller also maintains the constant output DC voltage.

Battery:

Battery specification-Battery has 12-volt and 12-amp hour rating

Arduino UNO:

Arduino Uno has total 28 pins, 14 digital input /output pins out of that 6 can be used for PWM output and it has 6 analog inputs. And 16 MHz crystal oscillator, with USB connection, power jack and reset button

Transistor :

Transistor is electronic component used to amplify or switch electronic signal.

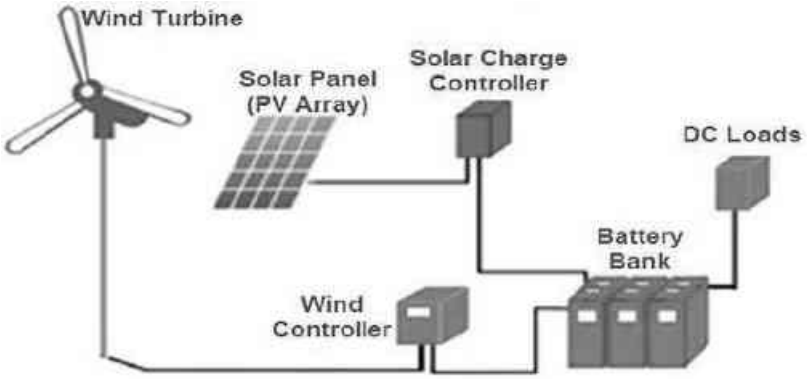
Voltage Regulator :

The 7805 IC is used as voltage regulator because circuit may have fluctuations and don't have fixed voltage. 7805 IC is used to provide constant DC voltage.

III. MODELING AND ANALYSIS

By performing the experiment on Hybrid system consisting of vertical structure wind mill and solar panel. win d mill consists of BLDC motor of output 12 v at 500 rpm and solar panel of 50 w. we get constant output voltage and parameters such as voltage, current and power.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com



IV. RESULTS AND DISCUSSION

Result of wind mill

Table: Result of Wind mill

Wind Mill Speed	Output voltage
500 rpm	12 v
455 rpm	10 v
400 rpm	8 v
200 rpm	4v

Result of Solar panel

Table: Result of Solar Panel

Solar radiation	Output voltage
1000W/M^2	21.2 v
500W/M^2	11 v
400W/M^2	9 v
200 W/M^2	5v

V. CONCLUSION

In the proposed system the solar wind hybrid system is used to give supply to the laboratory with de lighting. implementation solar wind hybrid system in hilly areas normally plenty amount of availability of the wind energy & remote areas application. the proposed system can be used. generation of electrical energy from solar wind hybrid system is very efficient and cost effective

VI. REFERENCES

[1] Solar-Wind Hybrid Energy System Using MPPT (IEEE Paper)
[2] Hybrid MPPT Controlled Solar/Wind Power System for Pumping System (IEEE Paper)
[3] Optimization of Solar-Wind Energy System Power for Battery Charging using MPPT (IEEE Paper)
[4] https://www.hindawi.com/journals/ijp/2016/1728398/
[5] https://www.google.com/search?client=opera&q=appli

[6] https://www.solarbyluminous.com/solar-basics
[7] https://energyswaraj.org/watch-training-videos.php
[8] https://justenergy.com/blog/introduction-to-solarpower/#:~:text=Solar%20power%20is%20a%20form,%E2%80%9Cgreen%E2%80%9D%20source%20of%20energy
[9] https://www.jagranjosh.com/general-knowledge/explained-rooftop-solar-scheme-objectiveuses-and-benefits-1611153985-1

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 6 June 2022, pp: 2119-2122 www.ijaem.net ISSN: 2395-5252

Smart Irrigation System

Vaishnavi Gavali[1] , Rutuja Pawar[2], Neha Nikam[3], Sushant Patil[4], Prof. V.T. Metakari[5]

[1,2,3,4] *Department of Electrical Engineering, Sanjeevan Engineering Technology & Institute, Panhala, Maharashtra, India.*

Submitted: 15-06-2022 Revised: 25-06-2022 Accepted: 27-06-2022

ABSTRACT
This paper deals with innovative technology in various ways to irrigate agricultural land using solar power. By using this system we can find suitability/humidity in the soil. And also we find the surrounding Temperature & humidity in air by using sensor. The main purpose of this paper provides irrigation by knowing the soil moisture. This system saves the energy and power and it is very important in future. We will use this project in countries where there is of water seems be in short for agriculture.

Keywords: Soil, Moisture sensor, Humidity sensor, Temperature, Arduino, Solar Panel.

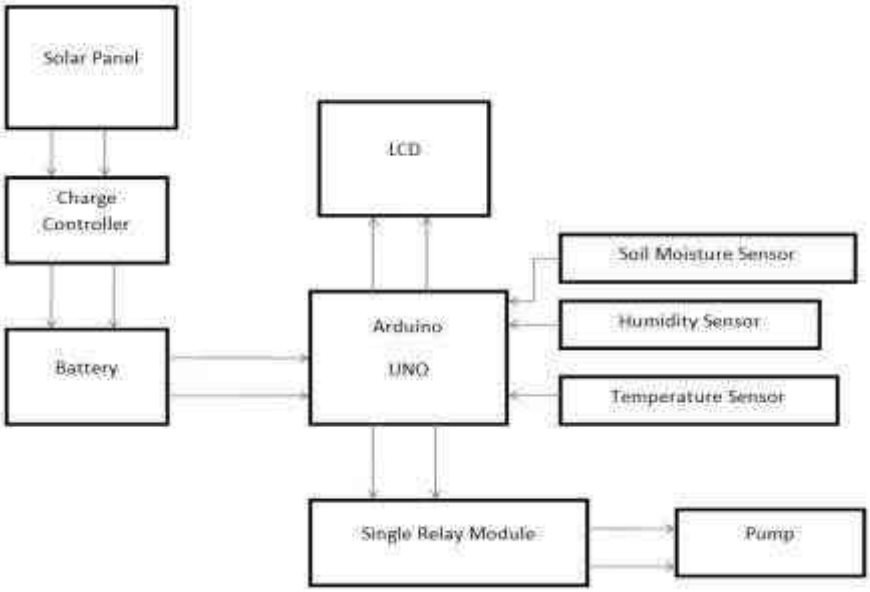
I. INTRODUCTION

The contribution of agriculture sector to the Indian economy is huge. The Use of manpower should not be excessive and these techniques need to be used to maximize profits over time. Nowadays the demand for energy is increasing and there is a constant flow of fuel into existing sources. And Sources and pollution is on the rise and forcing mankind to take up new, unconventional energy resources like solar energy, wind energy. Development of these new technologies is achieving our goal of sustainable development.

1] Photovoltaic pumping can be installed anywhere. And they can take care of five to ten years. Because they need less maintenance so it also reduces costs. 2] In the past irrigation method is major reason for this old method to imitate the crop in a traditional way without knowing the right Crop ratio, thus destroying some crops.3] We use this project to solve the problem. Due to the growth of the world's population, the growth of agriculture needs to be increased and on the other hand, due to the increasing demand for food due to the population, Farmers are facing many problems. 4] It can control the pump using Arduino based on an Arduino UNO based Automatic irrigation system in this project we have added soil moisture sensor, humidity sensor & Temperature sensor. To the input voltage signal of the input sense the moisture in the soil as well as sense the air& temperature of surrounding area. 5]You can also use the GSM model in this project. Using of this model we can do your motors off at home. 6] This project provides information by Arduino using sensors, when the soil is dry then motor is on when soil is wet then motor is automatically off it is displayed on LCD. 7] Solar Panels are generally known photovoltaic or PV panels. In solar conversion of sunlight in electricity & this electricity stored by battery. It is used to operate electrical equipment and power equipment.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 6 June 2022, pp: 2119-2122 www.ijaem.net ISSN: 2395-5252

II. BLOCK DIAGRAM AND WORKING



Above Fig show Arduino based irrigation system. Arduino is a brain of our project. In this project we connect solar panel, charge controller, battery, LCD, Single Relay Module. In this system we used three types of sensors soil moisture sensor, humidity sensor& temperature sensor. This sensor connected to the Arduino. We use nonconventional energy source. Solar converts sunlight into electricity, this electricity stored in battery through charge controller. In our project we used a one code and this code properly set in Arduino. On this code three sensors are worked automatically. Soil moisture sensor is work when the soil is dry then pumps get automatically on and soil is wet then pump is not working automatically. Humidity sensor senses the surrounding air and Temperature sensor measure the temperature. We connect relay to input of the Arduino these relay control the operation of the water pump.

III. COMPONENTS

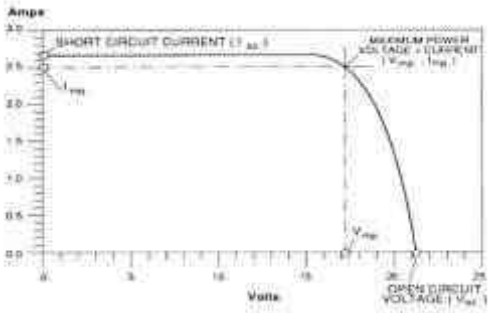
1. Solar Panel

Fig 3.1 Solar Panel

Solar energy is the most abundant source of energy in t device used to into we electricity world. It is Convert sunlight in this project used 20 solar polycrystalline solar panel that consist of several crystals of silicon in a single pv cell. This solar panels made up of multiple photovoltaic cell each cell contains silicon crystals which makes it function as a semiconductor device.

$$I=I_0[\exp(qV/nkT)-1]-I_l$$

Power=20watt
Voltage=12v
Short circuit current=1.66amp



2. Arduino Uno

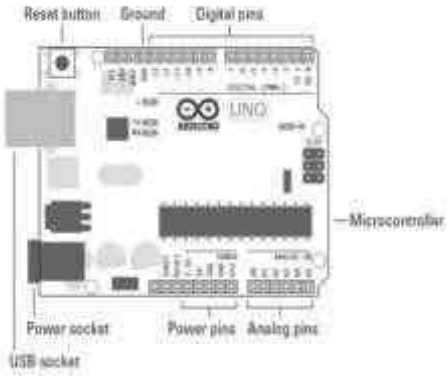


Fig3.3 Arduino Uno

This project we use UNO Arduino board. It is Open Source electronic platform with

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 6 June 2022, pp: 2119-2122 www.ijaem.net ISSN: 2395-5252

microcontroller ATmeaga328P. It has 14 digital input /output Pins. It is developed by Arduino.cc. It is used for variety of electronic project. Arduino is a 16MHZ ceramic resonator. Arduino operation at 5V and maximum current 40mA.The Arduino Uno is programmed using the Arduino Software (IDE), our Integrated Development Environment common to all our boards and running both online and offline.

3. Soil Moisture Sensor

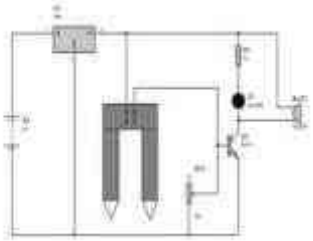


Fig3.3 Soil Moisture sensor

Soil moisture sensor usually refers to sensor that estimates volumetric water content. Soil moisture measure the water content in the soil. This device used to convert Physical Parameter into electrical signal. Soil moisture removing, drying and weighing of a sample. Soil moisture depending on environment. Operating voltage in this sensor 3.3to 5v.

4. Temperature sensor

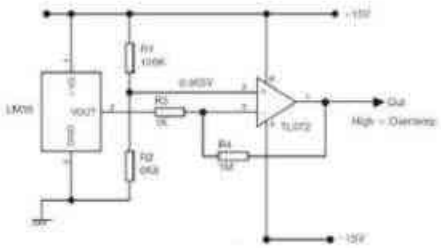


Fig3.4 Temperature Sensor

Temperature sensor basically measure the heat generated by an object to which is connected. In this project we use LM35 Temperature sensor. It is semiconductor based sensor LM means linear monolithic. LM35 is that outputs are analogue signal. In LM35 have three pins.

5. Humidity Sensor

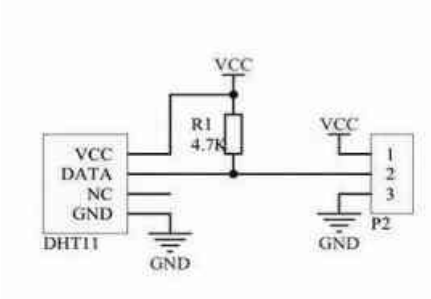


Fig3.5 Humidity Sensor

This sensor measure surrounding air. Humidity range of this sensor is 20 to 80% with 5% accuracy. The rate of this sensor is 1Hz. It is measured water vapour present in air. DHT11 is a digital temperature & humidity sensor. It is operating at 3 to 5volt. Maximum current is 2.5mA.

6. Relay

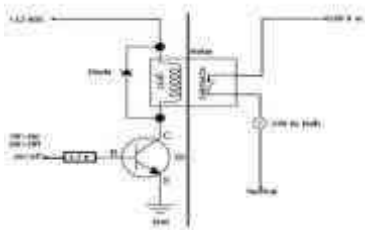


Fig3.6 Relay

This is single opt coupler isolated relay .It is a 5v relay. It is used for control the operation of water pump. This is a programmable electrical switch can be controlled by Arduino. It is use by control on/off the device.

4. Specification of the system

Sr No	Components	Specification
1	Solar panel	20W
2	Water pump	12V DC
3	Arduino	5V
4	Soil moisture sensor	3.3V To 5V
5	Relay	5V
6	LCD	4.7V To5.3V

5. Future scope:

1] Rain gun sensor can be added so that when it rains there won't be floods & this shield the field. & evades floods.

2] Irrigation is process of providing the desire amounts of water to the agricultural land. This

process is beneficial in minimizing runoffs or drought situations for the croup cultivation

IV. RESULT & ANALYSIS

Irrigation can be completed in farmer, garden, & greenhouse etc. This system can be automatically. It can be concluded that Photovoltaic systems are designed to supply water and irrigation in areas where there is scarcity of electricity. Also since sun is used as the energy source output coincides with the amount of solar radiation. The selected irrigation system should be such that it minimizes the water losses without putting additional pressure on the water head. The system was able to achieve the temperature before and after operation of the system. This system able to communicate with the moisture to make sure it fulfils the required meant of irrigation The farmers, agriculturist, nursery will be highly benefited with system because it is easy to operate and user friendly.

Soil Testing

Types of soil	Temperature	Humidity	Dryness in soil	Wetness in soil
Red Soil	25	80	667	387
Black Soil	25	80	672	395

V. CONCLUSION.

The aim of this project saves power, energy & time. The Automatic irrigation system based on soil moisture using Arduino has been tested successful. Display the humidity data provide by the Sensor in LCD Screen. Moisture sensor measure moisture level in the soil. When Soil dry then motor goes on. When soil is sufficiently waited then pump goes on. The energy needed to the water Pump & controlling system is given by solar panel. By using solar energy save the electricity & reduce pollution.

REFERANCE

[1]. Aliyu A.G and Sambo A.S ,Study of photovoltaic solar water pumping system in various clientcondition
[2]. Ghonim A.A ,Design optimization of photovoltaic power water pumping system
[3]. Shamma Ali, Hamad Saif, Hasa Rashed and ammarNatsheh, Photovoltaic energy Conversion
[4]. Cuihong Liu Wentao Ren Benhua Zhang Changyi lv, The application of soil temperature measurement by LM35 temperture sensor.
[5]. Abhaysharma loveprit singh,Harpritkaurchanni, Design of smart irrigation system using Arduino.
[6]. 6.SalehElkelaniBabaa,MneerAhmed,SalimAhmed ,Shahid ali khan ,Design of Arduino
[7]. Geoffrey,G.,Dieu,m.,pierre,N.AndAmable ,T.Design of automaticirrigation system for small farmers in agriculture.
[8]. Venkata Naga Rohit Gunturi, "Micro Controller Based Automatic Plant Irrigation Systems" International.
[9]. Kshitij Shinghal, Arti Noor, Neelam Srivastava, Raghuvir Singh; "intelligent humidity sensor for wireless sensor network agricultural application"; International Journal of Wireless & Mobile Networks(IJWMN) Vol.3, No.1, February 2011.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 7 July 2022, pp: 310-313 www.ijaem.net ISSN: 2395-5252

Reverse Recovery of Motor Shubham Mane, Shivraj Mali, Niral Dand

1flat No 1 Anant Plaza Kagal
2grampanchayat Chouk Unchgaon
3shahupuri 1st Lane Kolhapur
PROF. P. B. GURAV,
ELECTRICAL ENGG DEPARTMENT, SETI PANHALA

Submitted: 01-07-2022 Revised: 04-07-2022 Accepted: 08-07-2022

ABSTRACT - In today's world industrialization is growing very fast, there are many types of industries particularly manufacturing and process industries need three phase induction motor for their process work. Three phase induction motor plays very important role in industries. Reversal of motor is a crucial problem in the industries, normally VFD method is used to control reversal of motor but it is very expensive. By use of few electronic components, we can solve this problem. The use of this project is to to avoid the damages of driven equipment due to rotation in reverse direction. To find optimum and cos effective solution for reverse rotation detector instead of bigger and costly panel, To demonstrate the solution of reverse rotation which we can use for any type of motor or rotating equipment.
Keywords- motor, reverse rotation, control

I. INTRODUCTION

If driven equipment is rotate in reverse direction, then it may cause the damage of driven equipment or the damage the output of the driven equipment. To avoid this we may use this reverse rotation device which is avoid the reverse rotation of 3Ph induction motor which is majorly used in industry by using microcontroller & proximity sensors. This is cost effective solution instead of bigger control panel & we can use same for any type & rating of motor. Electric motor is an electrical machine that converts electrical energy into mechanical energy. Most electric motors operate through the interaction between the motor's magnetic field and electric current in a wire winding to generate force in the form of torque applied on the motor's shaft. Electric motors can be powered by direct current (DC) sources, such as from batteries, or rectifiers, or by alternating current (AC) sources, such as a power grid, inverters or electrical generators. An electric generator is mechanically identical to an electric motor, but operates with a reversed flow of power, converting mechanical energy into electrical energy

1.1 OBJECTIVES

The objective of the project reverse recovery of motor has 'to protect the motor from rotate in opposite direction'. Main purpose of this project will be to stop motor to rotate in reverse direction. In present time to overcome this situation VFD are used, which are very high priced. In our project we are doing this work in very cost-effective price and easy to operate

II. LITERATURE SURVEY

Author yen-chuan chang and ying-yu tzou presents a new sensor less starting method for brushless DC motors without reversing rotation for unidirectional applications. The method can detect the rotor position at standstill and a specific start-up method is then used to accelerate the motor up to a middle-speed where conventional sensor less control algorithms based on the back- EMF can work properly. The proposed scheme employs only one current sensor at DC-link side of the inverter, and can be applied to a motor without knowing its parameters and additional position sensors. As compared with previous approaches, the presented technique can simplify the sensor less position detection procedure and lower the cost. The proposed initial rotor position detection technique has a resolution of 30 electrical degrees, and does not cause any rotor vibration during the detection process. The sensor less starting scheme has been implemented on a single-chip DSP controller (TMS320LF2407A) and experimental results reveal that the starting procedure can work smoothly without temporarily reversing rotation

Ching-Tai Chiang discusses the influence of reverse rotating field on the vibration of separated phase

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 7 July 2022, pp: 310-313 www.ijaem.net ISSN: 2395-5252

induction motor. The sequence circuit model of the separated phase induction motor will be established. In the separated phase induction motor, the series capacitor of auxiliary winding is used to reduce the reverse rotating field. The torsional vibration problem will be solved following the reverse rotating field is eliminated. This paper uses the practical measurement to prove the theory

The Farhan Malik Shaikh use method of proximity sensor (limit switch) and outcome of this study is Boolean logic used has been successfully completed by using this method for dc motor

III. CONSTRUCTION AND WORKING

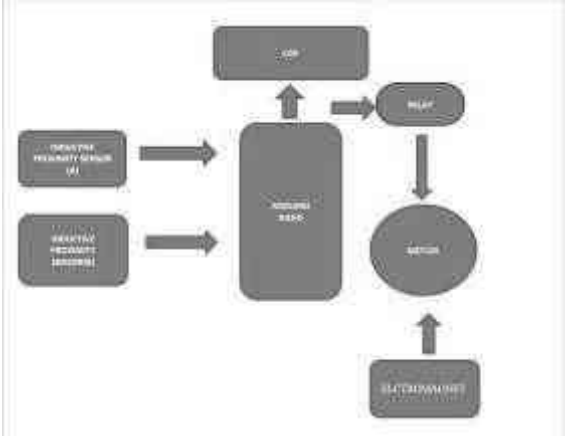


FIG 1. BLOCK DIAGRAM

In this system we will use two inductive proximity sensors they will be placed very close to the motor shaft. The proximity sensor detects the shaft rotation. The output of proximity sensors is given to interspines of the Arduino that is pin no.2 and 3. We will detect the time period between these two interrupts. If the motor moves in clockwise direction interrupt 1 will occurs first and then interrupt 2 will occur after few milliseconds. In case of motor reversal this time will be greater by differentiating this two time differences we can easily find out the direction of rotation of motor. All the calculations will be done by the Arduino microcontroller. We will use Arduino nano for this purpose Arduino uno has six analog input pins and fourteen digital input output pins. We can use the digital input output pins for interfacing a LCD display, the LCD display will show a exact time difference between the two interrupts and it will also show the direction of rotation. If the rotation is in the reverse direction, it will switch off the motor through the relay and the contactors. Otherwise, the motor will remain ON. This will prevent the motor from rotating in the reverse manner and hence the further damage can be minimized. In this study, a method that stops motor to rotate in reverse direction has been developed. While performing the ARDUINO NANO which acts as a brain of setup gives all commands to each components to perform.

LCD display will show a exact time difference between the two interrupts and it will also show the direction of rotation furthermore arduino gives command to relay for on and off the electric motor in requried conditions. that means if in prossesing the motor in reverse direction then relay will turn off the motor if its in required direction then motor will remian in on condition.formost LCD also provide information about system is in well being condition or not.

Two Inductive Proximity sensor are situated in shaft section of electric motor for sensing the electric motor motion Inductive Proximity sensor A have contineous eye on motor rotating is required direction.Moreover Inductive Proximity Sensor B is placed for to sense,due to any issues if the motor moves in reverse direction then sensor will forwards the information to the arduino nano.On the other hand Electromagnet is implemented to act as a breaking system in reverse direction of electric motor. By locating electromagnet the time is minimised to stop the motor.

3.1 Forwad rotating condition

Under normal operating condition motor starts rotate in forward direction where the LCD display shows motor speed in rpm. In forward operating condition A7 pin of port A of arduino nano connected to relay 1 which operates in clockwise direction of shaft. Furthermore, relay 1 performs mainly to control and ON AND OFF the electric motor.

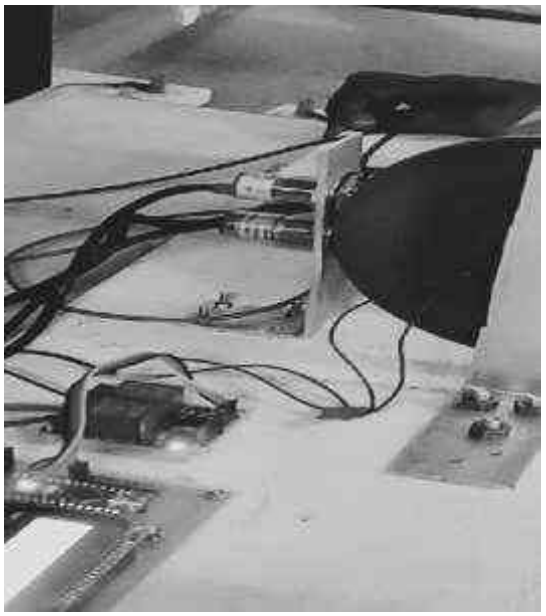


FIG 2. RELAY 1 WORKING CONDITON

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 7 July 2022, pp: 310-313 www.ijaem.net ISSN: 2395-5252

3.2 Reverse rotating condition

The conditon where motor rotates in reverse direction then ardunio nano commands to relay2 which is connected to A6 pin of port A in arduino nano.Furthermore, relay2 is connected with electromagnet which is used to stop the motor. While performing we placed electromagnet to minimize time to stop the motor we situated electromagnet and motor in between 8mm distance . despite from this relay2 and electromagnet works only in reverse conditon to stop the motor

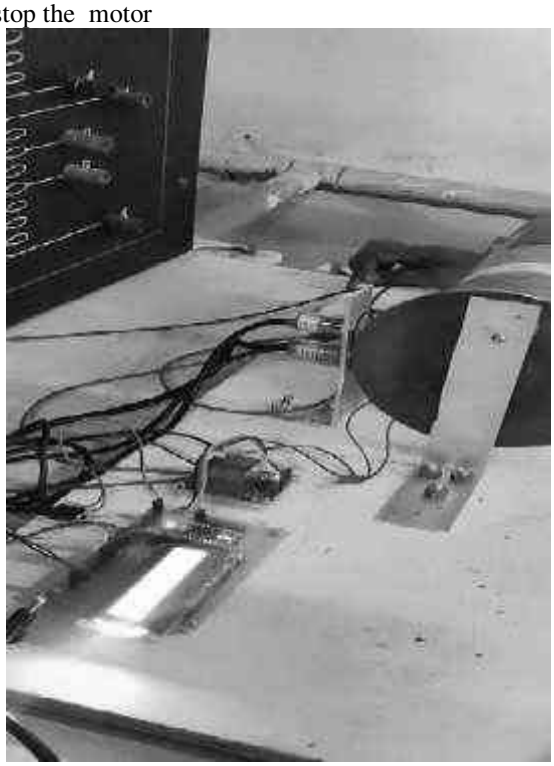


FIG 3. RELAY 2 WORKING CONDITON

3.3 Proximity sensor A and B

All the sensing performance is held by inductive proximity sensors . moreover, proximity sensor 1 is connected to pin D3 of port D of ardunio nano as well as proximity sensor 2 is linked with pin D4 of port D of ardunio nano. Furthermore proximity sensor 1 and 2 senses the speed and the direction of motor . moreover, is shows the rpm on the LCD display as well as it also detect the rotating contion of motor

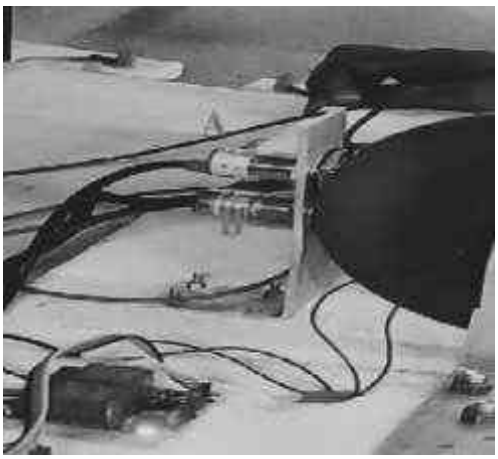


FIG 4. INDUCTIVE PROXIMITY SENSOR A AND B

IV. FINAL SETUP

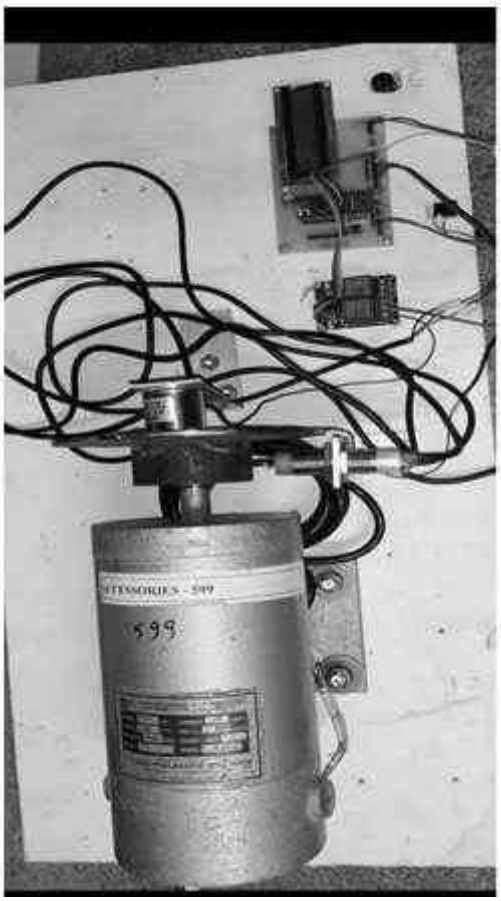


FIG 4. FINAL WORKING SETUP

V. CONCLUSION

Hence this reverse rotation controller useful to avoid the damages of driven equipment due to rotation in reverse direction. Hence, we have found optimum and cost-effective solution for reverse rotation detector instead of bigger and costly panel. Hence, we have

proposed the solution of reverse rotation which we can use for any type of motor or rotating equipment.

REFERENCES

[1]. W. Shepherd and G.R. Slemon, "Rotor Impedance Control of the Wound-Rotor Induction Motor," AIEE Transactions, R. III, vol. 78, pp. 807-814, Oct. 1959.
[2]. B.K. Bose, Power Electronics and AC Drives. Prentice Hall, New Jersey, 1986.
[3]. G.M.J. Parsley, "Controlling the Speed of an Induction Motor by Resonating the Rotor," Electron, vol. 7, no. 5, pp. 22-25, May 1990.
[4]. Etten Maier, T.M., Novotny, D.W., Lipo, T.A, "Single phase induction motor with an electronically controlled capacitor", Conference Record of the 1988 IEEE,2-7, vol.1, pp. 169 - 174, 1988J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp. 68-73.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

SMART BLIND STICK

Sneha Patil[*1], Uday Patil[*2], Pratik Patil[*3], Najim Mullani[*4],
Sangram Bhosale[*5], Prof. N.S Jadhav[*6]

[*1,2,3,4,5]Students, Department of Electrical Engineering, Sanjeevan Engineering and Technology Institute Panhala (Maharashtra, India).

[*6]Assistant Professor, Department of Electrical Engineering, Sanjeevan Engineering and Technology Institute Panhala (Maharashtra, India).

ABSTRACT

Nowadays, there is a need for a Private Mentor for a blind person. This project presents a smart stick for a blind person. Most of us, who are normal and healthy can reach the destination easily but visually impaired people who cannot Walk independently face problems in their daily lives. They will be in need of continuous help and companionship till they reach their desired destination. This System is designed to detect the obstacle and provides the live location of a person in case a person goes out of the desired location. Whenever an obstacle is found in the path of a blind person, it alerts him through a buzzer, and in case of an emergency, the exact location of the person is tracked by GPS and sent to the caretaker through the GSM module. There is a continuous ongoing interaction between the microcontroller and these modules. So, when the switch is pressed, the GPS module tracks the latitude and longitude of the location where the blind person is standing and sends it to the microcontroller which converts it to a form of Google map link and sends it to the predefined mobile number of the caretaker with the help of the GSM module. The Ultrasonic sensor frequently senses the obstacles within the corresponding range which is set in the Arduino. If any obstacles are found, create a buzzer sound with the vibration of the blind stick so that it can alert the blind person about his surroundings. This system cost is less, gives a fast response, is easy to handle, and is affordable to blind persons.

Keywords: GSM, GPS, Microcontroller, Sensors.

I. INTRODUCTION

A survey by WHO (World Health Organization) carried out in 2011 estimates that in the world, about 1% of the human population is visually impaired (about 70 million people) and amongst them, about 10% are fully blind (about 7 million people) and 90% (about 63 million people) with low vision. The main problem with blind people is how to navigate their way to wherever they want to go. Such people need assistance from others with good eyesight.

These days, visually impaired people deteriorate from serious visual impairments preventing them from traveling individually. In like manner, they need to use a wide range of tools and techniques to help them in their mobility. One of these techniques is orientation and mobility specialist which helps the visually impaired and blind people and trains them to move on their own independently and safely depending on their other remaining senses. Recently, many techniques have been developed to enhance the mobility of blind people that rely on signal processing and sensor technology.

We are providing a solution to this by presenting the “Smart Blind Stick”. This stick consists of various sensors like an ultrasonic sensor, a water sensor with a GPS-GSM module, and with Arduino board with an integrated Atmega 328 microcontroller. The sensor senses the obstacle and gives a signal to Arduino and notifies the user through a buzzer. GPS gives the location of the blind person in case the person goes out of the convenient location. In this system, GSM will help to track the location of the person handling the stick.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

II. SYSTEM ARCHITECTURE

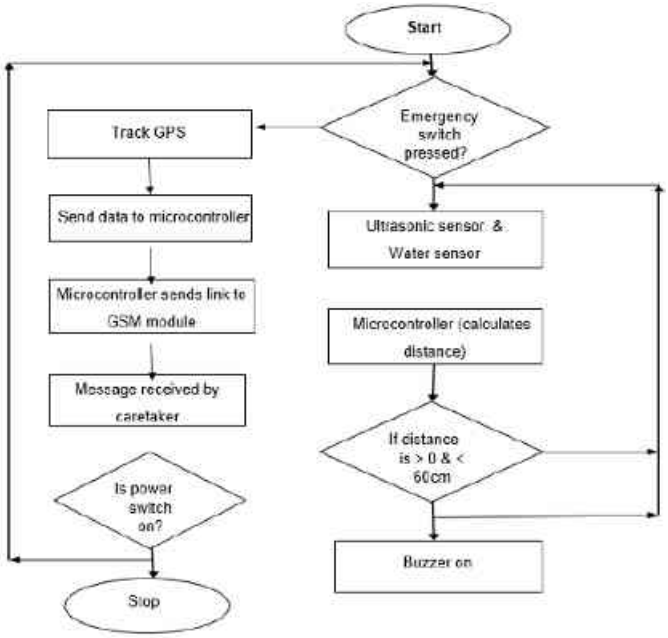


Figure -1: System Architecture

The basic modules in the system are the GPS, GSM, ultrasonic sensor, and water sensor. There is continuous ongoing communication between the Arduino and these Sensors.

First of all, the ultrasonic sensor continuously monitors the surrounding of the blind stick to alert the blind person about obstacles. Whenever an obstacle is found in the path of a blind person, it cautions him with a buzzer sound which gives him a more straightforward comprehension of the visually impaired individual about his environmental factors. The water sensor is utilized here to identify the presence of water in the way of a visually impaired individual and give caution to him with a buzzer sound. At the point when a client got panics when he presses the panic switch this switch is introduced on the highest point of the stick, then the GPS calculates the latitude and longitude of the location where the blind person is standing and coveys a signal to the microcontroller. The microcontroller converts it into the form of a Google map link and sends it to the provided mobile number of the caretaker with the help of the GSM module.

III. HARDWARE DESCRIPTION

Arduino UNO

Figure -2: Arduino UNO

Arduino is an open-source, prototyping platform that is widely used in the digital world owing to its simplicity and ease of configuration. The Arduino UNO R3 utilized in this undertaking is a microcontroller board in light of the ATmega328. The microcontroller is displayed in the Figurer it has a 16 MHz gem oscillator, and 14 advanced input/yield pins of which 6 can be utilized as PWM outputs.

Arduino has 6 analog inputs, a USB association that works as the power source and correspondence channel, a power jack, an ICSP header, and a reset button. In contrast with another Arduino, it has a more powerful CPU. easy and simple programming language of Arduino. In this task, Arduino is the intellect of the undertaking. It controls all things and enterprise.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

Ultrasonic Sensor

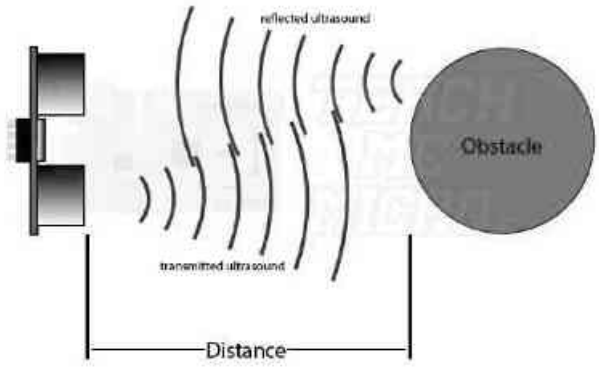


Figure -3: Ultrasonic Sensor

An ultrasonic sensor is an electronic gadget that actions the distance of an objective item by producing ultrasonic sound waves and converting the reflected sound into an electrical signal. Ultrasonic waves travel quicker than the speed of discernible sound (for example the sound that people can hear). Ultrasonic sensors have two fundamental parts: the transmitter (which produces the sound utilizing piezoelectric gems) and the recipient (which experiences the sound after it has ventured out to and from the objective). We are involving this sensor in our stick to identify hindrances like vehicles, pits, and posts.

One ultrasonic sensor is placed on the stick in order to identify the greatest region around the stick.

Water Sensor

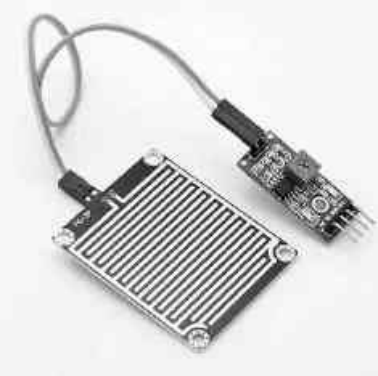


Figure -4: Water Sensor

A water sensor is arranged for water detection, which can be generally used in detecting precipitation, water level, and, surprisingly fluid spillage. Interfacing a water sensor to an Arduino is an amazing method for distinguishing a hole, spill, flood, downpour, and so on. It can be utilized to identify the presence, the level, the volume, or potentially the shortfall of water.

A water sensor is utilized to recognize the presence of water in the way of visually impaired individuals and give a caution so as to stay away from chances of slipping.

Global Positioning System

Figure -5: GPS Module

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

A GPS System used for the purpose of navigation and detection of objects and places typically works on the fundamental standard of trade of radio waves between the ground stations, satellites, and the recipients. This transmission and reception of data prefer a trilateration mechanism of operation.

We are using a GPS module in our stick to get the real-time location of blind people. A GPS module discovers the actual location of the person. In the case of a visually impaired individual got panicked. that time he can take help by sharing his live location.

Global System for Mobile Communications

Figure -6: GSM Module

GSM is used 850MHz, 900MHz, 1800MHz, and 1900MHz frequency bands for transmitting mobile voice and data.it is also open and digital cellular technology. GSM innovation was created as a computerized framework utilizing the time-division numerous entrance (TDMA) method for communication purposes.

In order to share the location information of the Blind person here, we used SIM800 GSM Module which is connected to the Controller.

IV. RESULTS

Ultrasonic Sensor Working Results

When the user walks with Smart Blind Stick that time if any hurdle is detected through an ultrasonic sensor buzzer gives a particular rhythm. This rhythm changes as per the distance between stick and obstacle. So, users can easily identify the distance of obstacles. This Rhythm is useful for easily avoiding hurdles. Rhythm changes results are shown in the following table.

Table -1: Ultrasonic Sensor Results

Sr. No	Distance between stick and obstacle	ON Time	OFF Time
1	Below 10 cm	2 sec	0.2 sec
2	10 cm to 25 cm	0.3 sec	0.3 sec
3	25 cm to 45 cm	0.3 sec	0.4 sec
4	45 cm to 60 cm	0.3 sec	0.7 sec

Water Sensor Working Results

When the user walks with Smart Blind Stick that time if water or rain is detected through the water sensor buzzer gives a particular rhythm. The water sensor rhythm result is shown in the following table.

Table -2: Water Sensor Results

Sr. No	ON Time	OFF Time
1	0.4 sec	0.2 sec

GPS and GSM Module Working Results

When a user unknowingly goes to an unfamiliar place and when the user got panics. After the user panics user presses the panic button. After pressing the panic button GPS module calculates the location and creates the

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

location link. Using this link Create an emergency SMS. GSM Module sends this SMS to the which phone numbers are already stored in the microcontroller. After receiving this SMS through the user's family or relatives realize that the user got panic. So, that time only by clicking on this SMS link family or relatives can easily detect the precise location on GOOGLE MAP. By using this SMS link family or relatives can easily discover the user. This SMS is continually sent after 12 sec if the user change location at that time it is very useful for easily discovering the user.

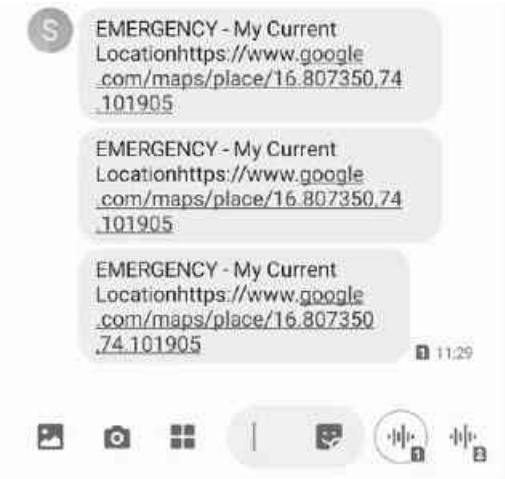


Figure -7: Emergency Massage Output with Current Location Link

Figure -8: Current location of a user by using GOOGLE MAP

V. CONCLUSION

Toward the finish of our task, we can infer that our venture can decrease the number of hazards and wounds for the outwardly hindered individual while strolling in public. Nowadays, at a shockingly beginning phase in life, a couple of individuals are outwardly weakened. The Modern Blind Stick goes presumably an essential stage for the approaching age. Assuming the quantity of chance and wounds expanding quickly, the youngster or the individual will lose their soul to autonomously walk.

The Modern Blind Stick goes probably as a basic stage for the oncoming age. this includes contraptions to help the obviously hindered to investigate safely both indoors and outside. It is successful and reasonable. It

prompts great outcomes in recognizing the snags on the way of the client in the scope of two meters. However, the framework is permanently set up with sensors and different parts, it's light in weight.

VI. REFERENCES

[1] Kunja Bihari Swain, Rakesh Kumar Patnaik, Suchandra Pal, Raja Rajeshwari, Aparana Mishra, and Charusmita Dash, Arduino Based Automated STICK GUIDE for a Visually Impaired Person, IEEE 2017.

[2] Mukesh Prasad Agrawal, Atma Ram Gupta, Smart Stick for the Blind and Visually Impaired People, ICICCT 2018.

[3] G. Srinivas, G. M, Raju, D. Ramesh, S. Sivaram, Smart Blind Stick Connected System Using Arduino, IJRAR 2019.

International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 07 | July - 2022 Impact Factor: 7.185 ISSN: 2582-3930

IOT Based Smart Food Dryer

Rohit Anil Koli[1] , Rushikesh Deepak Patil[2],
Omkar Rajkumar Wale[3] , Prof. P.P.Kulkarni[4]
Student, Electrical Engineering Sanjeevan Engineering & Technology Institute[123]
Professor, Electrical Engineering Sanjeevan Engineering & Technology Institute[4]

Abstract: The solar drying system utilizes solar energy to heat up air and to dry any food substance loaded, which is not only beneficial in that it reduces wastage of agricultural produce and helps in preservation of agricultural produce, but it also makes transportation of such dried produce easy and promotes the health and welfare of the people. This paper presents the design and construction of a domestic passive solar food dryer. The dryer is composed of solar collector (air heater) and a drying chamber containing fruits and vegitables trays both being integrated together. The air allowed in through air inlet is heated up in the solar collector and heaters through the drying chamber where it is utilized in drying (removing the moisture content from the food substance or agricultural produce loaded). The design was based on the hybrid system. which is more reliable system is obtained for proper design specification. Locally available materials were used for the construction, iron body of container(painted), inlet and outlet fans (air ventilation system), mild steel metal sheet and net trays for wastage.

Keywords: Solar drying; Solar collector; Agriculture produce; Optimum temperature.

I Introduction

Drying is one of the method of food preservation .Drying system preserve foods by removing enough moisture from food, the key is to remove spoilage .Drying of food, the key is to remove moisture as quickly as possible at a temperature that does not seriously affect the Flavour, texture and color of the food .Conventional method of drying such as sun Drying, hot air convection drying requires more time to completely dry the product.

In this paper, we designed a dryer for fast and efficient drying of agricultural products. we use a reduced pressure environment (vacuum) for drying the agricultural products which enables the liquid to evaporate without elevating the temperature. combined with heat vacuumcan be and effective method of drying. The smart dryer dries the products without losing its quality. The low cost of smart dryer makes it suitably for use in industrial as well as householdpurposes. The time required for drying is reduced as compared to conventional methods. The device mainly consists of a vacuum chamber, vacuum pump, heat source, temperature and humidity control system and some auxiliary systems. Compared with the conventional methods, this device just needs a small area and it can work under a completed indoor situationof natural environment. It shows high practical value and social economic benefits.

Drying is the oldest preservation technique of agricultural products and it is an energy intensive process. High prices and shortages of fossil fuels have increased the emphasis on using alternative renewable energy resources. Drying of agricultural products using renewable energy such as solar energy is environmental friendly and has less environmental impact.

Sun drying is a popular and economical method for drying of food materials in the developingcountries. But drying rate is very low and dependent on weather conditions. Inferior quality of sun-dried products is mainly due to uneven drying, mixing of dust and dirt, and contamination with insects and microorganisms.

Sometimes the whole amount of product is spoiled in adverse weather conditions. As an alternative to sun drying, solar drying is a promising alternative for drying of fruits and vegetables in developing countries. Mechanical drying, mainly used in industrialized countries, is not applicable to small farms in developing countries due to high investment and operating costs.

Solar energy for crop drying is environmental friendly and economically viable in developing countries. In natural convection solar dryers, the air flow is due to buoyancy-induced air pressure, while in forced convection

Solar drying is often differentiated from sun drying‖ by the use of equipment to collect the sun‘s radiation in order to harness the radiative energy for drying applications. Sun drying is a common farming and agricultural process in many countries, particularly where the outdoor temperaturereaches 30ºC or higher. In many parts of South East Asia, spice s and herbs are routinely dried.However, weather conditions often preclude the use of sun drying because of spoilage due to rehydration during unexpected rainy days. Furthermore, any direct exposure to the sun during high temperature days might cause case hardening, where a hard shell develops on the outside ofthe agricultural products, trapping moisture inside. Therefore, the employment of solar dryer tapson the freely available sun energy while ensuring good product quality via judicious control of the radiative heat. Solar energy has been used throughout the world to dry products. Such is the diversity of solar dryers that commonly solar-dried products include grains, fruits, meat, vegetables and fish. A typical solar dryer improves upon the traditional open-air sun system in five important ways. It is more efficient. Since materials can be dried more quickly, less will be lost to spoilage Immediately after harvest.

This is especially true of products that require immediate drying suchas freshly harvested grain with high moisture content. In this way, a larger percentage of products Will be available for human consumption. Also, less of the harvest will be lost to marauding animals and insects since the products are in safely enclosed compartments. It is hygienic. Sincematerials are dried in a controlled environment, they are less likely to be contaminated by pests,and can be stored with less likelihood of the growth of toxic fungi. It is healthier. Drying materialsat optimum temperatures and in a shorter amount of time enables them to retain more of their nutritional value such as vitamin C. An added bonus is that products will look better, which enhances their marketability and hence provides better

Traditional drying / open sun drying system (OSD):

This is a traditional method for drying food items in this, the product is spread on ground in thin layer and directly exposed to solar radiation and dried up to safe moisture content. but in this type of drying method farmer facing some problems for example Dust. animals, over sun light, rain.

Drawbacks Of Open Sun Drying (OSD):

- Slow process.
- Reduction in quality of product due to insects, micro-organism growth.
- spoilage of product due to rain, heavy wind, dust ,birds and animals.

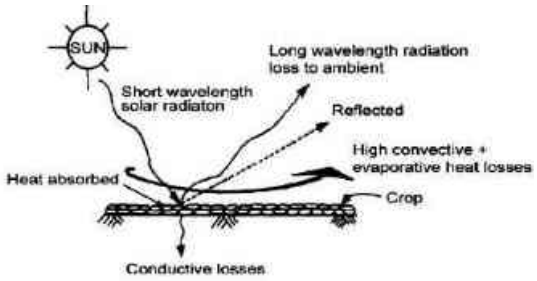


Fig.1 Sun Drying System

II Literature review

This involves the machinery to humidify and dry the paddy grains within the limited period of time. They used solar power as the energy source to two alternating batteries, the main source of energy in the system. It is programmed by the microcontroller to set the desired level of humidity and temperature according to the quantity of rice [1]. This method of drying is used to dry fruits with the help of microcontroller based system and also

with the help of IR rays. Energy for this project is obtained from solar energy. Infrared rays are passed to hydrate the water content and blower is used for further drying [2]. The use of both solar and electrical energy so called hybrid solar energy. The air flow occurs inside the dryer by the motor fan arrangement and heating of substance is done by falling of the sunlight. Here the temperature is controlled by sensing the temperature and thus control the temperature of heating substance. Thus, it is a good example for future drying system [3]. The authors intended to implement a closed circuit which can monitor the utilization of electrical energy and its automatic control on it. The radio frequency signals emitted detects the electricity status in each room and power off the circuit when user leaves the room. A microcontroller is programmed to ensure safety measures [4]. This is the alternate method of drying the agricultural products under the sun with solar dryer which consist of a heating element. It is a cost-effective way and can be used in large scale by local people. The energy trapped by the absorbers is the main element of the system [5].

III System Design

In many parts of the world there is a growing awareness that renewable energy have an important role to play in extending technology to the farmer in developing countries to increase their productivity. Solar thermal technology is a technology that is rapidly gaining acceptance as an energy saving measure in agriculture application. It is preferred to other alternative sources of energy such as wind and shale, because it is abundant, inexhaustible, and non- polluting. Solar air heaters are simple devices to heat air by utilizing solar energy and employed in many applications requiring low to moderate temperature below 80 C, such as crop drying and space heating. Drying processes play an important role in the preservation of agricultural products.

They are defined as a process of moisture removal due to simultaneous heat and mass transfer. According to two types of water are present in food items; the chemically bound water and thephysically held water. In drying, it is only the physically held water that is removed. The most important reasons for the popularity of dried products are longer shelf-life, product diversity as well as substantial volume reduction. This could be expanded further with improvements in product quality and process applications. The application of dryers in developing countriescan reduce post-harvest losses and significantly contribute to the availability of food in these countries. Estimations of these losses are generally cited to be of the order of 40% but they can, under very adverse conditions, be nearly as high as 80%. A significant percentage of these losses are related to improper and/or untimely drying of foodstuffs such as cereal grains, pulses, tubers, meat, fish, etc.

The use of heat under regulated conditions to eliminate the water present in foods via evaporation to generate solid items is referred to as drying. Evaporation, on the other hand, produces concentrated liquid products. The primary goal of drying is to increase the shelf life of foods by lowering their in-water activity. In the absence of adequate water, microorganisms that cause food deterioration and decay, as well as numerous enzymes that induce undesirable changes in the chemical makeup of food, are unable to grow, proliferate, or operate

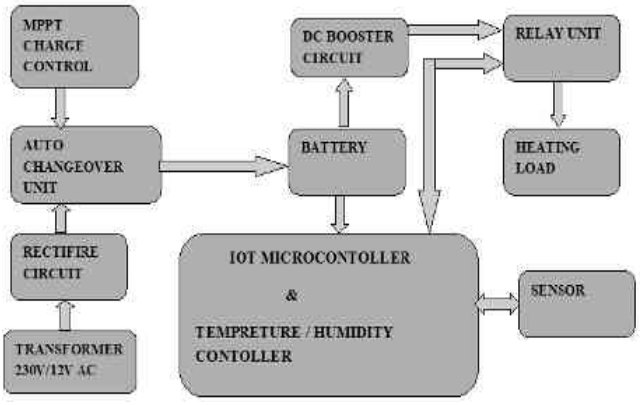


Fig.2 Block Diagram

Methodology:

In this study, a smart method that uses the drying kinetics of foods in the drying process has been developed. While developing the method, it was planned to use the moisture data in the drying

environment regarding the drying kinetics. Using these data, drying curves were constructed for each food type. By using these curves during the drying process, the drying process is managed in real-time. In this way, drying can be made at the desired moisture rate and while this ratio is achieved, the total duration of the drying process can be calculated so the operation of the oven and thus the use of energy is optimized.

While developing the most suitable model for the experimental data in food drying, humidity in the environment was used instead of a continuous measurement of the mass of the dried material. Using moisture data has been preferred to provide an easier solution in industrial environments. There are precision sensors on the market that have been developed for the monitoring of humidity in industrial environments

There is a rising realisation in many areas of the world that renewable energy may help farmers in underdeveloped nations enhance their output by extending technology to them. Solar thermal technology is fast gaining favour as a cost-effective energy-saving technique in agriculture. Because it is plentiful, limitless, and nonpolluting, it is favoured above other alternative energy sources such as wind and shale. Solar air heaters are simple devices that use solar energy to heat air. They are used in a variety of applications that need a low to moderate temperature below 80 degrees Celsius, such as crop drying and room heating.

The preservation of agricultural goods relies heavily on drying techniques. They are characterised as a moisture removal technique including both heat and mass transport. Food items include two forms of water: chemically bonded water and physically held water, according to experts. Only the physically retained water is eliminated while drying. The appeal of dried products is mostly due to their extended shelf life, product diversity, and significant volume reduction. With advances in product quality and process applicability, this might be pushed much further. The use of dryers in poor nations can help to minimise post harvest losses and increase the availability of food in these areas. The losses are usually estimated to be on the order of 40%, but they might be as high as 80% in extreme circumstances. Proper and/or timely drying of commodities such as cereal grains, legumes, tubers, meat, fish, and so on accounts for a major portion of these losses.

Solar Source:

Solar energy is a powerful source of energy that can be used to heat, cool, and light homes and businesses. More energy from the sun falls on the earth in one hour than is used by everyone in the world in one year. A variety of technologies convert sunlight to usable energy for buildings. The most commonly used solar technologies for homes and businesses are solar photovoltaics for electricity, passive solar design for space heating and cooling, and solar water heating.

Businesses and industry use solar technologies to diversify their energy sources, improve efficiency, and save money. Energy developers and utilities use solar photovoltaic and concentrating solar power technologies to produce electricity on a massive scale to power cities and small towns.

MPPT Charge Controller:

The **maximum power point (MPP)** describes the point on a current voltage (I-V) curve at which the solar PV device generates the largest output i.e. where the product of current intensity (I) and voltage (V) is maximum. The MPP may change due to external factors such as temperature, light conditions and workmanship of the device. In order to ensure maximum power output (Pmax) of a solar PV device in view of these external factors, **maximum power output trackers (MPPT)** may be operated to regulate the resistance of the device.

Anyone familiar with the charging and discharging characteristics of the battery is familiar to the fact that the voltage of the battery varies with its charge content. As current flows from a high potential to low potential, the steeper the gradient or voltage difference, the greater is the **flow of current**.

AUTO CHANGEOVER UNIT

The project is designed to automatically supply continuous power to a load through one of the four sources of supply that are: solar, mains, generator, and inverter when any one of them is unavailable. Two switches are used for four respective sources. These are connected to a microcontroller of 8051

family that provides input signals to it. Whenever a switch is pressed it shows the absence of that particular source. A relay driver is used that receives microcontroller generated output and switches that particular relay to provide continuous power supply. A lamp is used as a load for demonstration purpose which draws power from main. When main fails to supply power, automatically next available source is used say inverter. If inverter fails then the next one is used and so on

Dc Booster Circuit:

A boost converter (step-up converter) is a DC-to-DC power converter that steps up voltage (while stepping down current) from its input (supply) to its output (load). It is a class of switched-mode power supply (SMPS) containing at least two semiconductors (a diode and a transistor) and at least one energy storage element: a capacitor, inductor, or the two in combination. (supplyvside filter).

To reduce voltage ripple, filters made of capacitors (sometimes in combination with inductors) are normally added to such a converter's output (load-side filter) and input
In this tutorial we will learn how to build and how a DC to DC boost converter works. The circuit is very basic using just one diode, an inductor and a capacitor. The switch will be a MOSFET transistor and to create the PWM signal we will use a 555 timer in the PWM configuration, boost adjustable controller or one Arduino NANO. But first let's study a little bit of theory. We have the Boost converter circuit in the next figure where we can see the switch, inductor and capacitor and of course we add a load to the output.

Battery:

When the sulfuric acid dissolves, its molecules break up into positive hydrogen ions (2H+) and sulphate negative ions (SO4 —) and move freely. If the two electrodes are immersed in solutions and connected to DC supply then the hydrogen ions being positively charged and moved towards the electrodes and connected to the negative terminal of the supply. The SO4 — ions being negatively charged moved towards the electrodes connected to the positive terminal of the supply main (i.e., anode)

Arduino Micro-Controller:

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board -- you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.

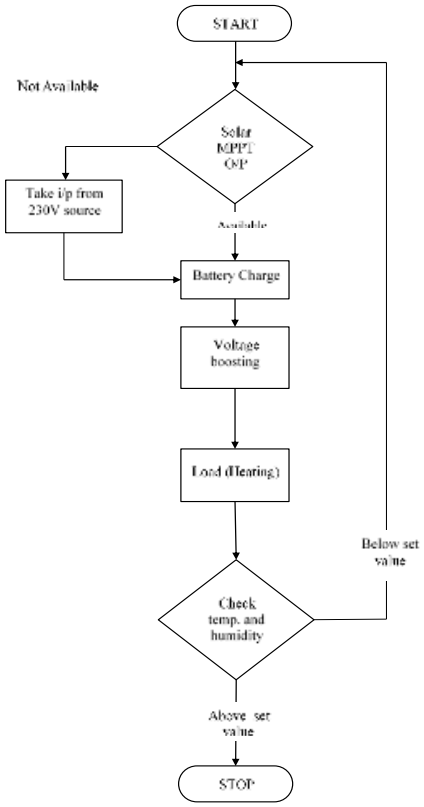


Fig. 3 Flow chart

IV Experimental Results

Fig.4 Load box

Testing

In this image you can see heating element and air conditioning system is ON because we set the Tempreture limit is 32*C and that time container Tempreture is below 32*C so to maintain the Tempreture system is in ON Condition

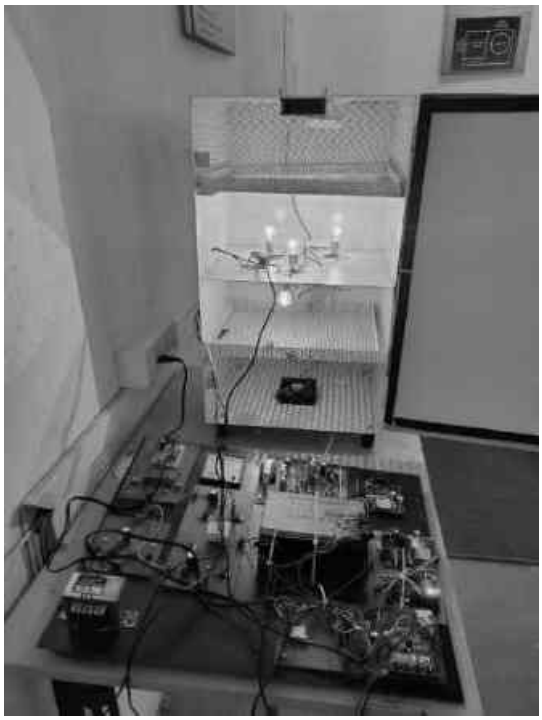


Fig. 5 Prototype model

Result

Our group tested this project and we put different ingredients in it and saw the time and temperature of drying and we got the following result.

Table 1 Results of hardware

Sr No	Food item	Sun Drying Time	IOT base Smart food Dryer time
1	Raw Cashew	2-3 days	6-7 Hours at 60-70*C temp
2	Chili paper	3-4 days	8-9 hours at 80*C
3	Yellow raisins	2-4 days	14 hours at above 50*C

V Conclusion

The developed smart system manages the drying process in real-time by using the humidity in the environment instead of weight together with the drying kinematics of the product is designed. So the complexity of the system is simplified. In

addition to this, the system estimates the required duration to complete the drying process according to the input status of the products and gives feedback to the process owners. The model improves itself and can automatically control the process until the desired moisture is achieved. Since the duration of the drying process can be determined, the process owners can easily plan the before and after activities of the drying process.

In this process, the energy loss is also minimized by preventing the unnecessary opening and closing of the drying stages to measure the weight of the products. Finally, since the desired moisture level can be defined, unnecessary heating is prevented and thus energy is used optimally.

The capacity of the system developed in the project is limited. When systems with different capacities are desired to be developed or when uses other than full capacity in the existing system, a new problem arises that needs to be solved. This problem is the most appropriate positioning of the moisture sensors to be used in the oven. If the positioning is not optimal, the time estimates may be incorrect when the furnace first starts up. Also, deviations in drying rates may occur. As the next step, new studies can be made on furnace design and sensor positioning optimization.

References

i. Ajay, C., Sunil, K.S., and Deepak, D. 2009. "Design of Solar Dryer with Hybrid system and Fireplace". International Solar Food Processing Conference 2009.

ii. Esper, A.; Muhlbauer, W. Solar drying—An effective means of food preservation. Renewable Energy 1998, 15, 95–100.

iii. Bala, B.K.; Woods, J.L. Simulation of the indirect natural convection solar drying of rough rice. Solar Energy 1994, 53 (3), 259–266.

iv. Goswami, D.Y.;Lavania, A.;Shabbzi,S.; Masood, M .Analysis of age odesic dome solar fruit dryer. Drying Technology 1991, 12 (3), 677–691.

v. Vlachos, N.A.; Karapantsios, T.D.; Balouktsis, A.I.; Chassapis, D.Design and testing of a new solar dryer. Drying Technology 2002, 20 (5), 1243–1271.

vi. Ghazanfari, A.; Tabil, L.; Sokhansanj, S. Evaluating a solar dryer forin-shell drying of split pistachio nuts. Drying Technology 2003, 21 (7), 1357–1368.

vii. Bassuoni, A.M.A.; Tayeb, A.M. Solar drying of tomatoes in the formof sheet. In Proceedingsof the 3rd International Drying Symposium; Ashworth, J.C., Ed.; Birmingham, UK, 1982; 385–389.

International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 07 | July - 2022 Impact Factor: 7.185 ISSN: 2582-3930

Single Phase to Three Phase Converter

Gaurav Anil Kamble[1], Digvijay vilas Patil[2], Rushikesh Uttam Nalavade[3]
Raj Sarjerao Powar[4], Tushar Ramchandra Patil[5], Prof. A.M.Bhandare[6]

Student, Electrical Engineering Sanjeevan Engineering & Technology Institute[12345]
Professor, Electrical Engineering Sanjeevan Engineering & Technology Institute[6]

Abstract - This paper presents a converter topology for driving a three-phase motor load from a single-phase supply. It consists of a rectifier and an inverter circuit. The front-end rectifier is to provide a DC link voltage through a split capacitor. The two-leg inverter converts this Dc link voltage into 3 phase supply. This converter can run a three-phase Induction motor which is much more efficient compared to a single-phase motor. In this paper, two closed-loop controllers are employed to achieve balanced output voltage. Among those two closed-loop controllers, one is for maintaining the DC link voltage constant and, the other is for inverter output. Therefore, the single-phase to three-phase converter brings the controllable output voltage as in a six-switch standard three-phase inverter. The front-end rectifier has the capability of active input current shaping. The designed converter model is simulated by using MATLAB Simulink software.

I Introduction

In the past, single-phase to three-phase conversion systems were made possible by the connection of passive elements capacitors and reactors with autotransformer converters. Such kind of system presents well know disadvantages and limitations. Both have the advantages of simple structure and reasonably low cost. Since the beginning of the solid state power electronics, the semiconductor devices were the major technology used to drive the power processors. Looking at the semiconductor devices used in the former controlled rectifiers and comparing them with the new technologies it makes possible to figure out the astonishing Development. Beyond the improvement related to power switches, it was also identified a great activity in terms of the circuit topology innovations in the field of three phase to three-phase, single phase to single phase and three-phase to single phase conversion systems. The single-phase induction motor drives by the three-phase induction motor drives in some low-power industrial applications. When the three phase induction motor is driven by a single phase induction motor by rotary phase converters and autotransformer capacitor phase converters, this causes more loss as compared to the new this method. Motor drives constitute a predominant load for the agricultural sector. As most rural communities in the India are supplied with single-phase ac power, these drives have to be realized with single-phase motors, or with three phase motors (Induction Motors) driven by phase converters. Autotransformer capacitor phase converters, however, cannot easily obtain balanced output voltage with reasonable cost, and rotary converters are heavy and have significant no-load losses, also both topologies have high inrush current during motor start up. The three-phase induction motors have some advantages in the machine efficiency, power factor, and torque ripples compared to their single-phase counterparts. Though the precise control of single phase induction motor is less complex in comparison to the three phase induction motor, but when the torque requirement is considered then three phase induction motor is the best choice. The applications for these motors cover almost every stage of manufacturing and processing. It is not surprising to find that among all type of electric

motors, Induction motor is so popular, when one considers its simplicity, reliability, and low cost. Therefore, it is desirable to replace the single-phase induction motor drives by the three-phase induction motor drives in some low-power industrial applications in some rural areas where only a single-phase utility is available, we should convert a single-phase to a three phase supply. This paper proposes an alternative solution for phase conversion with very low overall cost, moderate motor performance during start up and high steady-state performance at line frequency.

II Literature review

1. Naung Cho Wynn et al. (2008)A new single phase to three phase converter topology for small industries is presented in this paper: Phase converter, include this paper, is a new technology that supplies three phase power from a single phase source to power inductive, resistive and capacitive loads with distinct advantages over any existing converter technology. The converter consists of DC power supply, a MOSFET Hex-bridge, integrated gate drive IC, and a DSP to generate the switching signals. The switching signals generated are a unique version of selective harmonic elimination, which produces a consistent starting point for the switching functions, independent of the number of harmonics eliminated This converter covers the basis of induction motors and different types of other motors. They are ideal for farms, workshops, garages and large building etc.

2. EuzeliCipriano dos Santos et al. (2012)1Single-phase to three-phase conversion using power electronics converters is a well-known technology, especially when the configurations and control strategies already established in the technical literature are considered. Regarding the configurations conceived over the years, it can be observed two main tendencies: 1) configurations with a reduced number of components; and 2) configurations with an increased number of components. The search for topologies with a reduced number of components was the trend over a long period of time. This can be, in part, explained by the high cost of the power switch when compared to the capacitor used in the dclink bus. Then, the converter leg was sometimes substituted for the midpoint capacitor. However, as far as the price of the semiconductor was going down, such tendency has been changed, and now the configurations with an increased number of components do appear as an interesting option, especially in terms of reliability, efficiency, and distortions improvement. A comprehensive review of the two possibilities (reduced and increased number of components) has been considered in this paper. Also, the single-phase to three-phase ac–ac direct conversion configurations and those which aim to reduce the dc-link voltage fluctuation have been included. The goal of this paper is to provide a complete range on the status of single-phase to three-phase power conversion technologies to professionals and researchers interested in this topic.

3.Presented a simple converter topology for driving a load with a single-phase ac supply.Using only six active switch IGBT's. The converter supplies balanced output voltages at rated frequency, the proposed topology permits to reduce the rectifier switch currents, the harmonic distortion at the input converter side, and presents improvements on the fault and control approaches are supported by test results. The convertor takes single phase supply and converts it into three phase supply with the help of thyristors. The single phase supply is first converted into dc supply by using rectifier again dc supply of rectifier is given to inverter where IGBT's are used and converts the dc supply again into three phase ac supply. The experimental result showed that sinusoidal waveform produced remained approximately constant with increase in load and the developed hardware has satisfactory converted the single phase power to three phase power supply.

III Design Aspects

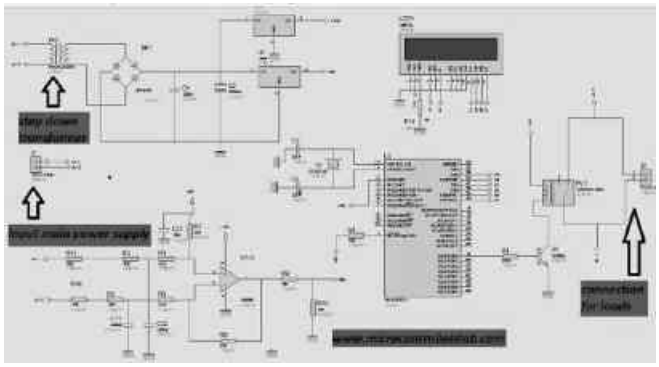


Fig.1 Circuit Diagram

In Agriculture area Three phase is only 8hours. Remaining hours there is only Single phase supply is available. So, hence we convert single phase supply to three phase to overcome farmers problem. In this, when supply comes at incoming unit, It gives supply to sensing unit. It sense where the supply is single phase or three phase, If supply is single phase then it gives supply to converter. It is a super capacitor based fully microcontroller converter, in this single phase to three phase conversion takes place. Then this three phase converted supply gives to voltage frequency converter. Which controls voltage and frequency & gives the controlled supply to the motor. If supply is 3 phase then, the supply is go through the relay unit to controller & the motor. In this condition rest of the system is in pause mode.

In this circuit four terminals of incoming supply R, Y, B, N, are conneted to 3 pole contacor and supply go to three banana pins. Then the supply go to the2 transformer , it steps down the suuply voltage to 24 volt & 1.5 amp. Then the supply go to the 3 phase pure sine wave transistor and thyristor based inverter. The inverter circuit activates by 8052 microcontroller based 6 stage transistor based gate firing circuit. Then the supply is passed through 2 pole 16A relay contactor and then the supply go to the output terminals. In this circuit 1 capacitor is connected for power factor improvement and for phase split purpose.

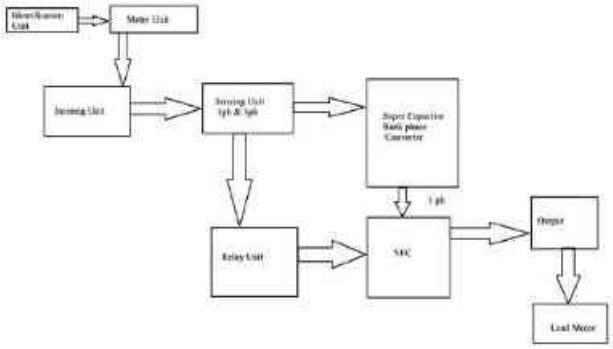


Fig. 2 Block Diagram

IV Experimental Results

A. Hardware result

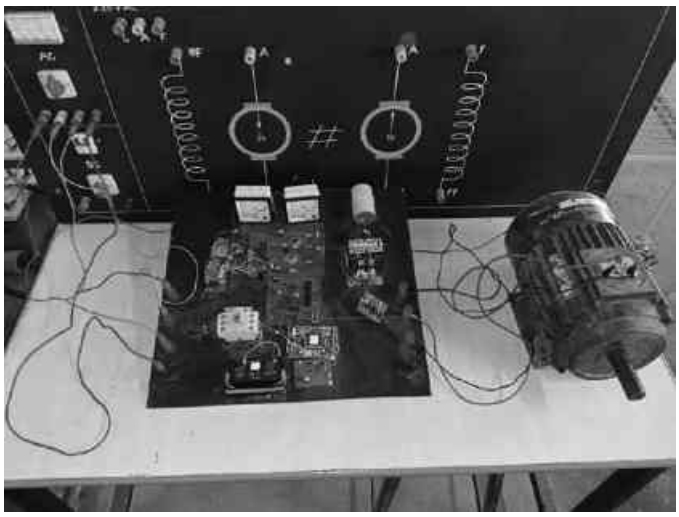


Fig. 2 Experimental result

The incoming supply R Y B N is connected to four terminals on kit. The incoming supply on kit is connected to 3 pole contactor. In this, when supply comes at incoming unit, It gives supply to sensing unit. It sense where the supply is single phase or three phase, If supply is single phase then it gives supply to converter. It is a super capacitor based fully microcontroller converter, in this single phase to three phase conversion takes place. Then this three phase converted supply gives to voltage frequency converter. Which controls voltage and frequency & gives the controlled supply to the motor. If supply is 3 phase then, the supply is go through the relay unit to controller & the motor. In this condition rest of the system is in pause mode. In this circuit four terminals

of incoming supply R, Y, B, N, are conneted to 3 pole contacor and supply go to three banana pins. Then the supply go to the2 transformer , it steps down the suuply voltage to 24 volt & 1.5 amp. Then the supply go to the 3 phase pure sine wave transistor and thyristor based inverter. The inverter circuit activates by 8052 microcontroller based 6 stage transistor based gate firing circuit. Then the supply is passed through 2 pole 16A relay contactor and then the supply go to the output terminals of R Y B N and this terminals is connected to motor wiring. In this circuit 1 capacitor is connected for power factor improvement and for phase split purpose.

B Simulation Results

A three-phase 5hp Induction motor with the specifications listed in the appendix section has been used in this simulation. The MATLAB model of the single-phase to three-phase converter is simulated and the results is shown in the below figures for the given three-phase induction motor. The output line voltages, three-phase output currents, speed (ωm), Electromagnetic torque (Nm) and THD for the input current.

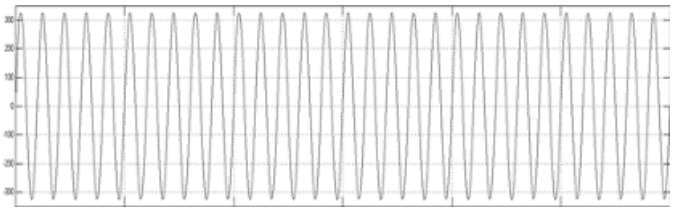


Fig. 3 Input source voltage

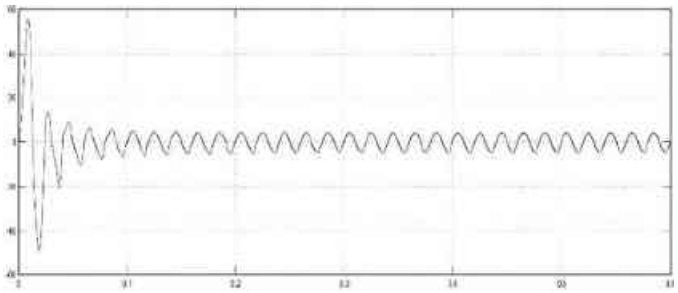


Fig.4 Source current

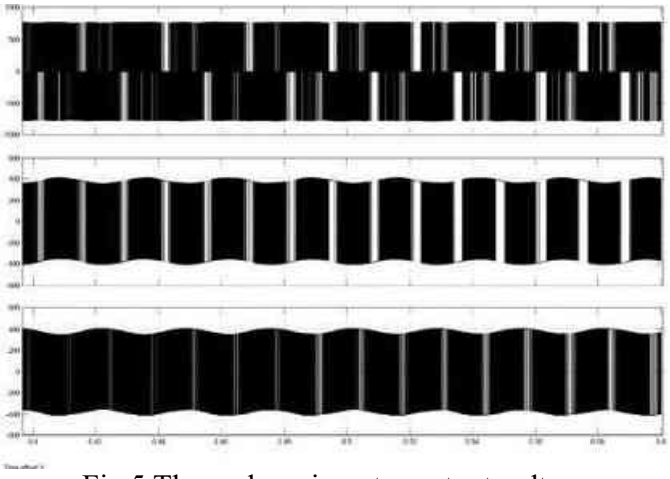


Fig.5 Three phase inverter output voltage

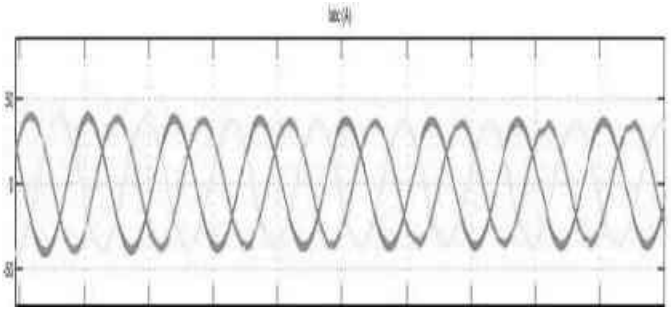


Fig. 6 Induction motor input currents

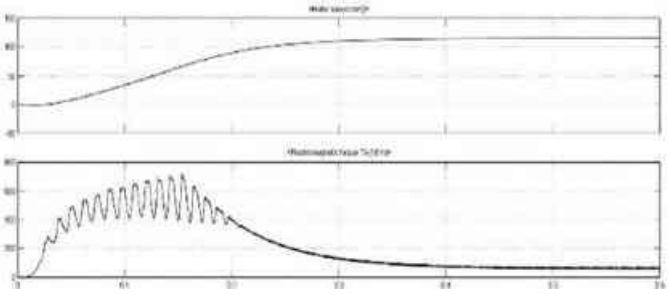


Fig.7 Motor speed and Electromagnetic torque

V Conclusion

Three phase asynchronous induction motors are widely used in industrial applications due to their features of low cost, high reliability and less maintenance. Due to the need for three-phase electricity in today's remote areas for agriculture work where three phase power is not available easily, in those areas these single phase to three phase converters are use full. Operating a three phase induction motor using single

phase supply has been presented. The developed system is useful in remote areas where three phase supply is not available easily. Applications of single phase to three phase converter are:

- Electric Vehicle.
- In Irrigation Pumps for Agriculture purpose.
- Rural Area Water Supply.

References

[1] Chingchi Chen, "A Hybrid Inverter/cylcoconverterBased Variable-Speed Three-phase Induction Motor Drive for Single-phase Inputs" IEEE Tran. on Industry application,Vol.31.no.3,may/june 1995 .

[2] P. N. Enjeti and A. Rahman, "A new single-phase to three-phase converter with active input current shaping for low cost ac motor drives,"IEEE Trans. Ind. Applicar., vol. 29, no. 4, pp. 80C813 July/Aug. 1993.

[3] Shivanagouda.B.Patil, M. S. Aspalli, "Operating Three Phase Induction Motor Connected to Single Phase Supply", 2012, International Journal of Emerging Technology and Advanced Engineering,(Nov 2012), ISSN 2250-2459.

[4] M. Khan, I. Husain, and Y. Sozer, "Integrated electric motor drive and power electronics for bidirectional power flow between the electric vehicle and dc or ac grid," Power Electronics, IEEE Transactions on,vol. 28, no. 12, pp. 5774–5783, Dec 2013.

[5] Vaibhav S. Chandekar; M.A. Chaudhari; V. Kalyan Chakravarthi, "A Low cost three phase induction motor drive operated on single phase input source, "in International Conference on Smart Electric Drives and Power System., June 2018, DOI: 10.1109/ICSEDPS.2018.8536009.

[6] E. Cipriano dos Santos. C. B. Jacobina, E. R. Cabral da Silva, N. Rocha," Single-phase to three- phase power converters: state of the art", IEEE transaction 0885-8993, 2011.

[7] Chirag Patel and R. Mahanty," Fuzzy Logic Controlled Unified Power Quality Conditioner for Power Quality Improvement," 16th NATIONAL POWER SYSTEMS CONFERENCE., December 2010, pp. 681-686.

[8] V. Kinnares and C. Charumit, ''Modulating functions of space vector PWM for three-leg VSI- fed unbalanced two-phase induction motors'', IEEE Trans. Power Electron. vol. 24, no. 4, pp. 1135-1139, Apr. 2009.

[9] Dong-Choon Lee, Young-Sin Kim, 'Control of single-phase-to-three-phase AC/DC/AC PWM converters for induction motor drives', IEEE Trans. Ind. Electron., 2007, 54, (2), pp. 797–804.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

11-STAGE MULTILEVEL INVERTER

Y.R. Naik[*1], A.M. Naik[*2], R.M. Mane[*3], A.R. Dorugade[*4], S.E. Gurav[*5], A.B. Suryawanshi[*6]

[*1]Professor, Department Of Electrical Engineering, Sanjeevan Engineering And Technology Institute, Panhala, Maharashtra, India.

[*2,3,4,5,6] Student, Department Of Electrical Engineering, Sanjeevan Engineering And Technology Institute, Panhala, Maharashtra, India.

ABSTRACT

This topology consists of a full-bridge multi-level inverter, as an auxiliary circuit. The cascaded multilevel inverter is connected after the dc power supply. The main point of the auxiliary circuit is to generate half level dc supply voltage. According to the switch on-off conditions the output voltage levels should vary. The switch in auxiliary circuit must be properly switched with respect to the direction of the load current. From the above all discussion, we can eliminate considerable number of harmonics and we can reduce THD. we can deduce that in cascaded multilevel inverter topology with right switching angle and conduction period take from the calculation based on Fourier analysis. It has the several features such as reduced total harmonic distortion, near sinusoidal type output voltage waveform.

Keywords: Cascaded Multilevel Inverter, Reduced Harmonic Distortion.

I. INTRODUCTION

In this paper, an experimental investigation has been carried out on single-phase multilevel inverter to obtain 11-level output voltage using cascaded four H-bridge units. The suggest system includes of four cascaded H-bridge MOSFET-based voltage sources inverters, a microcontroller-based Arduino imitation, four separate input DC sources and isolating circuit. The gate drive signals for MOSFETs of the four H-bridge inverters are generated by using ATmega microcontroller-based Arduino board. The microcontroller is used to reduce the difficulty of generating gate drive signals for multistory levels of inverter output voltage. 11-level output voltages have been exist from tentative works. It is found that the proposed system requires a smaller number of power switching devices and total harmonic distortion is reduced with increasing number of levels at the output voltage of the multilevel inverter. Power electronic converters, especially DC/AC inverters have been extending their range of use in industry because of their numerous advantages. They typically the stair-case type voltage waveform which has lower harmonic content. This project aims to extend the knowledge about the performance of 11 levels Cascaded H-Bridge multilevel inverter topology with Arduino. The PWM pulse will be generated by using Arduino. The output voltage is the summation of the voltage that is generated by all bridge. The switching angles can be pick out in such a way that the total harmonic distortion is decrease.

A new single phase cascaded multilevel inverter based on novel H-Bridge unit is used. The cascaded multilevel inverters have received special observation due to the reusability and clarity of the control. The cascaded multilevel inverters are mainly categorized into two parts: symmetric; with the equal magnitude for the dc voltage sources and asymmetric with different values of the dc voltage sources. By increasing the magnitude of dc voltage sources (Author-Ebrahim Babaei) [1]. In this project they use multilevel DC-AC inverter is proposed. The proposed multilevel inverter generates 7 level ac output voltage. The motive of multilevel topology is to reduce voltage rating of power switch. Therefore, it usually uses at high power application. By integrating output voltages in multilevel form, it has edge of low dv/dt, low input current deformity, and lower switching frequency. As a outcome of advantages of multilevel topology, several topologies have emerged in recent years (Author-Cheng-Han Hsieh) [2]. A cascaded H-Bridge with SPWM technique is presented. In Cascaded H-Bridge multilevel inverter, Number of H-Bridges are linked in series. Each H-Bridge having different DC supply which is to be acquire from any natural sources, ultra-capacitors, fuel cells or batteries to generate inverted ac output voltage. The advantage of these method is any capacitor or diode is not required for setting purpose and output waveform is like a sinusoidal in nature if number of level increases even we don't purify it. Multi-level inverters are used for high power as well as low power application in renewable energy sources such as wind, solar and

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

fuel cell. (Dr. Asha Gaikwad) [3]. The suggest topology is a voltage booster without using end side H-bridge for changing load voltage polarity. switching losses and total voltage force of semiconductor components reduce in the suggest converter. The carry out modes of the suggest topology, its modulation scheme, capacitors' balancing analysis, capacitance and loss calculations, and also the development of the suggest converter for enhancing the quality of output voltage waveform are discussed in depth. (Author-Meysam Saeedian) [4]. The optimization of levels with a minimum number of power supplies can be realize by using Asymmetrical multilevel inverters. An asymmetrical multilevel inverter topology is presented in this paper for medium voltage application. It is drew on the series cascade connection of the particular H-bridge inverter cells powered by the supply which are in Geometric propagation with different ratios such as 2,3 etc. An optimization angle control strategy is suggest for this topology that the switches of individual cells works at individual switching frequency for low switching losses. (Himanshu N Choudhari) [5]

II. METHODOLOGY

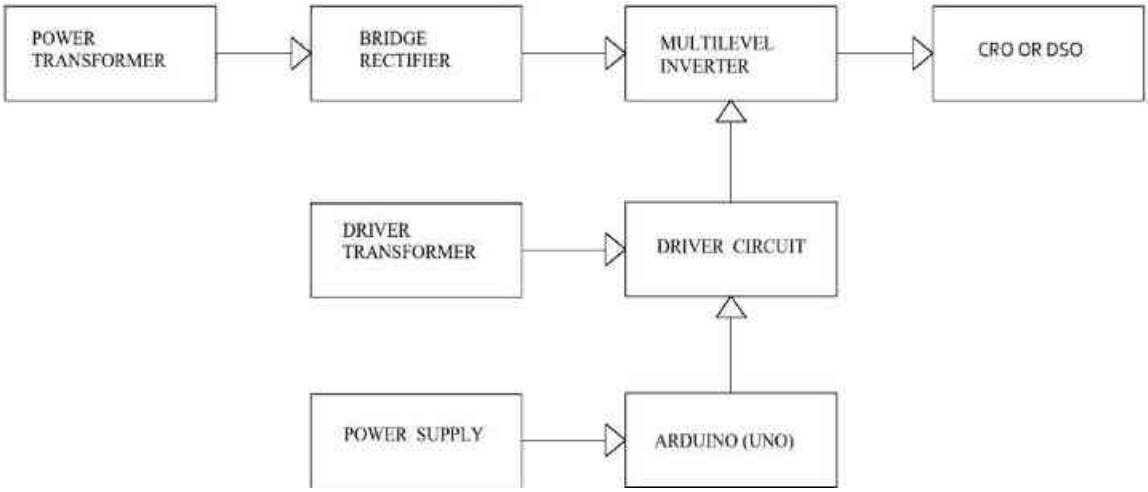


Figure 1: Multilevel Inverter Block Diagram

- Pulse generator: – Here we have used Arduino UNO to make a switching signal.
- Driver circuit: -It can be used to amplify the pulses and provided isolations by using optocoupler. It has two functions,
  - Amplification
  - Isolation
- Bridge Rectifier: It converts AC to DC Supply.
- Inverter: It converts DC to AC Supply.

III. MODELING AND ANALYSIS

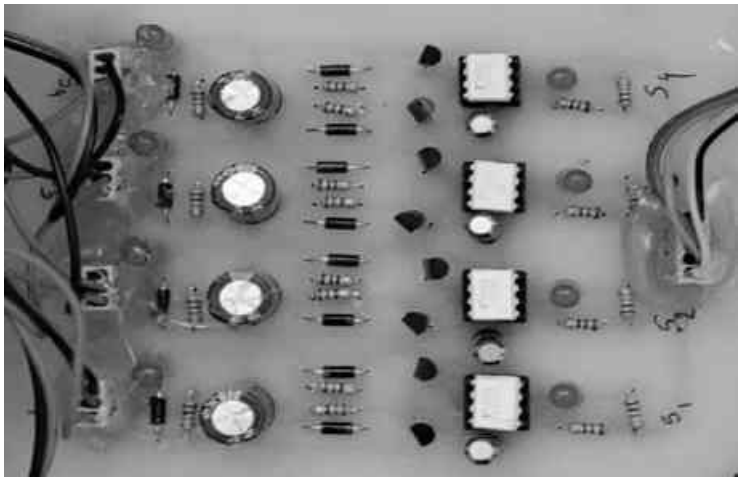


Figure 2: Driver Board

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

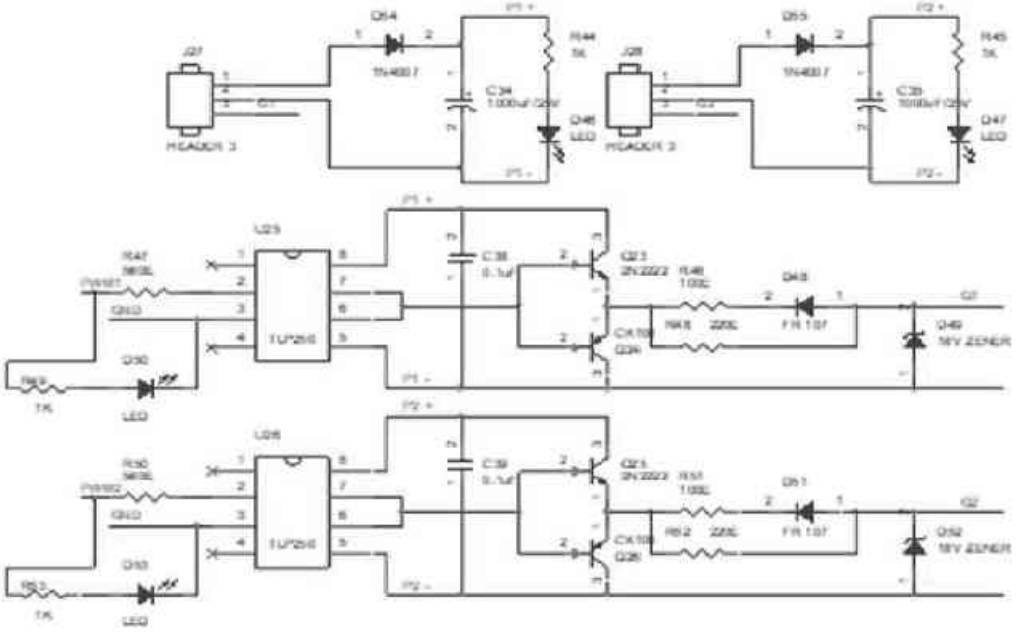


Figure 3: Circuit Diagram of Driver Board

If the optocoupler's LED is on the transistor will conduct and make the gate high, switching the MOSFET on. If the LED is off, the transistor will be off, and the gate will be pulled low by the resistor. Completely applicable, especially for not reversing relationship between optocoupler's status and MOSFET.

Table 1. Multilevel Inverter Switching Table

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
0	0	0	0	0	0	0	0	0	0	0	0	0
V1	1	0	0	1	0	1	0	1	0	1	0	1
V2	0	1	0	1	1	0	0	1	0	1	0	1
V3	0	1	0	1	0	1	0	1	1	0	0	1
V1+V2	1	0	0	1	1	0	0	1	0	1	0	1
V2+V3	0	1	0	1	1	0	0	1	1	0	0	1
-V1	0	1	1	0	0	1	0	1	0	1	0	1
-V2	0	1	0	1	0	1	1	0	0	1	0	1
-V3	0	1	0	1	0	1	0	1	0	1	1	0
V1-V2	0	1	1	0	0	1	1	0	0	1	0	1
V2-V3	0	1	0	1	0	1	1	0	0	1	1	0

At step first is S1, S4, S6, S8, S10, S12 switch is on and remaining MOSFET switch off. Second step MOSFET switch is S2, S4, S5, S8, S10, S12 are ON and remaining MOSFET switch off. Third step MOSFET switch is S2, S4, S6, S8, S9, S12 are ON and remaining MOSFET switch off. Fourth step MOSFET switch is S1, S4, S5, S8, S10, S12 are ON and remaining MOSFET switch off. Fifth step MOSFET switch is S2, S4, S5, S8, S9, S12 are ON and remaining MOSFET switch off. Six step is all MOSFET switch are off. Seventh step MOSFET switch is S2, S3, S6, S8, S10, S12 is on and remaining MOSFET switch off. Eight step MOSFET switch is S2, S4, S6, S7, S10, S12 is on and remaining MOSFET switch off. Nineth step MOSFET switch is S2, S4, S6, S8, S10, S11 is on and remaining MOSFET switch off. Tenth step MOSFET switch is S2, S3, S6, S7, S10, S12 is on and remaining MOSFET switch off. Eleven step MOSFET switch is S2, S4, S6, S7, S10, S11 is on and remaining MOSFET switch off.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

IV. RESULTS AND DISCUSSION

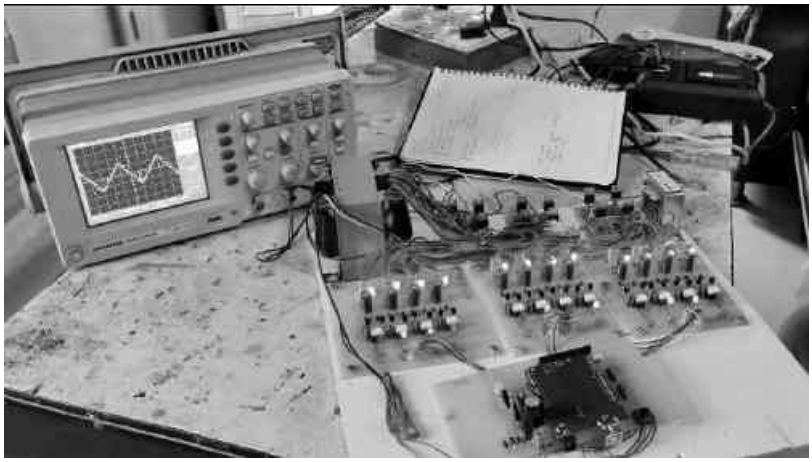


Figure 4: Experimental Setup of 11 level multilevel inverter

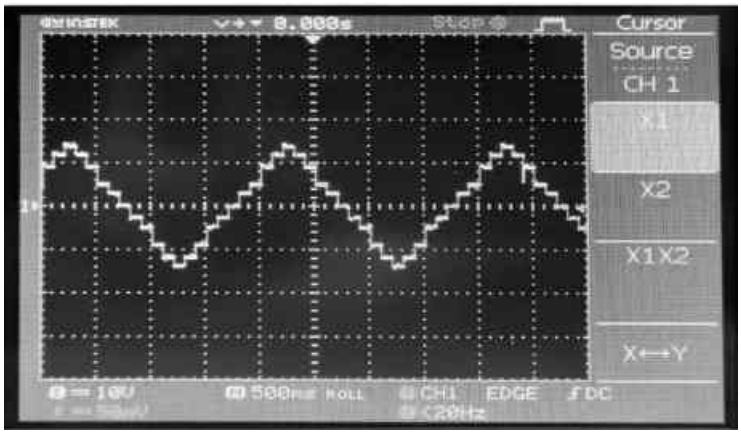


Figure 5: Output Waveform 11 level multilevel inverter

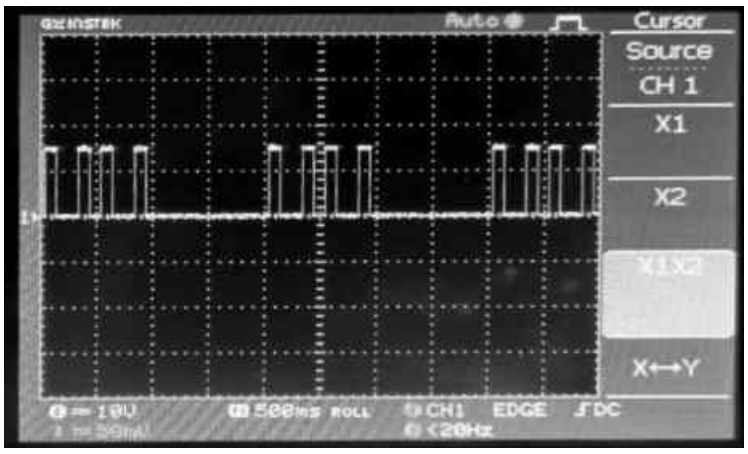


Figure 6: Voltage waveform across One Switch

Fig. 4 shows our actual Experimental Setup of 11 level multilevel inverter. An experimental investigation has been carried out on single-phase multilevel inverter to obtain eleven level output voltage using cascaded four H-bridge units. The suggest system consists of four cascaded H-bridge MOSFET-based voltage source inverters, a microcontroller-based Arduino module, four individual input dc supply and isolating circuit. The gate drive signals for MOSFETs of the four H-bridge inverters are generated by using ATmega based Arduino board.11-level output voltages have been obtained from experimental works. It is found that the proposed system requires a smaller number of power switching devices and total harmonic distortion is reduced with increasing number of levels at the output voltage of the multilevel inverter. Fig. 5 shows the output voltage waveform of

11 level inverter. Above result inspires us to increase the GP ratio and the number of bridges but it has been avoided due to complexity. It increases the cost and switching losses and hence will reduce the efficiency. Fig. 6 shows the output voltage waveform across single switch (S5).

V. CONCLUSION

From the above all discussion, we can conclude that in cascaded multilevel inverter topology with right switching angle and conduction period obtain from the calculation drew on Fourier analysis, we can eliminate considerable number of harmonics and we can reduce THD and by adding harmonic filter of proper frequency THD. Hence it results into elimination of the requirement of filters. Though, Total Harmonic Distortion reduce with increase in number of levels, every so often lower or every so often higher harmonic contents persist prevalent in every one level. These harmonics will prove more dangerous in induction drives. Hence the future work may be focalized by applying closed loop control with suitable elimination of harmonics.

VI. REFERENCES

[1] E. Babaei, S. Laali and S. Alilu, "Cascaded Multilevel Inverter with Series Connection of Novel H-Bridge Basic Units," in IEEE Transactions on Industrial Electronics, vol. 61, no. 12, pp. 6664-6671, Dec. 2014, doi: 10.1109/TIE.2014.2316264

[2] C. -H. Hsieh, T. -J. Liang and S. -W. Tsai, "Design and implementation of a novel multilevel DC-AC inverter," 2014 IEEE Energy Conversion Congress and Exposition (ECCE), 2014, pp. 5743-5748, doi: 10.1109/ECCE.2014.6954189.

[3] A. Gaikwad and P. A. Arbune, "Study of cascaded H-Bridge multilevel inverter," 2016 International Conference on Automatic Control and Dynamic Optimization Techniques (ICACDOT), 2016, pp. 179-182, doi: 10.1109/ICACDOT.2016.7877574

[4] M. Saeedian, S. M. Hosseini and J. Adabi, "A Five-Level Step-Up Module for Multilevel Inverters: Topology, Modulation Strategy, and Implementation," in IEEE Journal of Emerging and Selected Topics in Power Electronics, vol. 6, no. 4, pp. 2215-2226, Dec. 2018, doi: 10.1109/JESTPE.2018.2819498.

[5] H. N. Chaudhari and H. Chandwani, "Optimization angle control technique for multilevel inverter," 2015 IEEE International Conference on Electrical, Computer and Communication Technologies (ICECCT), 2015, pp. 1-6, doi: 10.1109/ICECCT.2015.7226008.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

EV CHARGING STATION

Pramod Guarav[*1], Hemant Parab[*2], Piyusha Desai[*3], Aniket Sabhasad[*4], Atul Kumbhar[*5], Aniket Jambhale[*6], Omkar Patil[*7], Ajay Kadam[*8]

[*1]Professor, Sanjeevan Engineering & Technology Institute, Panhala, Maharashtra, India.

[*2,3,4,5,6,7,8]Students, Sanjeevan Engineering & Technology Institute, Panhala, Maharashtra, India.

ABSTRACT

Solar charging station will be applied as a charger for electric powered vehicle. The solar panel will harvest energy from the solar that will be saved a battery % of automobile. In this undertaking erection of metallic shape with set up of solar panels became finished as in step with design.

Battery voltage for electric car is chosen as 48 volts. Charging voltage decided on on the idea of car battery Voltage. As per charging requirement 1000 watts, 3 panels of 330 watts are decided on with open circuit voltage as 46.3 volts and short circuit current as 9.24 Amp. To rate an electric powered automobile solar controller related among solar panels and battery package. This solar charging station can be commercialized to be positioned alongside a dual carriageway, or customized for an in-residence set up. Our group erected whole charging station, initiated from civil paintings, mechanical work and sooner or later electrical work. In this task work we obtained the information with interdisciplinary approach.

Keywords: Harvest, Erected , Interdisciplinary Etc.

I. INTRODUCTION

Population wise India stands second inside the global. The primary source of earnings for maximum of the population remains farming in India. Current agriculture systems are operated manually which consumes huge amount of time, cash and power. In India there is massive difference among overall electricity deliver & demand to the farming. In many regions strength reduce down maintains for extra than 8hrs.[1] The current era makes use of fossil gasoline in many elements of India, which creates air pollution. So, it higher to use renewable supply of electricity authorities also encourages its use in various sectors, including automation irrigation gadget for the farming. Solar power is the maximum ample source of power inside the world solar electricity isn't always simplest an answer to todays strength crisis but also an environment pleasant shape of power photovoltaic generation is and efficient approach for the use of the sun strength.[2]

The environmental blessings of charging stations that commonly run on sun energy. Decreased dependence on fossil fuels, Every day jogging expenses honestly are for all intents and purposes lower in a suitable way.[3] The load on traditional grids also receives reduced in a main manner. Apart from this, pretty large scale implementation will boom employment opportunities without a doubt because of the need for educated human beings for installation, preservation and operation of those stations, virtually opposite to famous notion. Considering the blessings and the supply of the sort of system, pretty many corporations actually are making an investment on this concept, which within reason considerable. Tesla Motors, a subsidiary of Tesla, The critical part is building solar-powered charging stations in handy locations for its EV clients, which is quite considerable.[4] This assignment will similarly efforts to reducing our dependence on fossil fuels. If our charging station can price greater devices without having outside strength from the countrywide grid, it will likely be capable of lessen a number of the call for for electricity .Most of the peoples aware about the outcomes of the use of oil and herbal gas as a shape of strength. These strategies do create masses of electricity, however they may be non-renewable and they effects in broken the environment and earth environment.[5] The objective of this undertaking is to rate the vehicles environmentally secure in an effort to assist to lessen the demand of strength from different techniques. Our goal for this task will generate electricity from sun energy.

Our layout changed into confined to what assets had been available for us. Luckily, the majority of the device for this device became provided through our main and the Electrical Engineering Department. We firstly estimated a much larger system with a couple of sun panels and batteries to offer a quick price time for the electric car. [6]We ended up the use of best 444W, 12 sun panels and 40 Ah deep cycle battery. The primary components of

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

the layout had been easy and logical in what would be needed to convert sun electricity into battery strength, after which be able to discharge the battery's power to be to be had for and utilized by the electric vehicle.

II. BLOCK DIAGRAM

Figure below shows the block Diagram of EV Solar Charging Station. For charging electric vehicle, we design and develop the system. For this system we use 3 solar panel of 330 watt. All three solar panel are connected in parallel connection. Connection of solar panel is given to Battery. We use Battery of 150Ah rating. The connection of battery is given to the inverter. The main function of inverter is to convert DC voltage into AC voltage. Inverter convert the 12 volt DC into 230 volt AC. This converted 230Volt AC supply is given to the outlet board .By this outlet we can crage the electric vehicle .

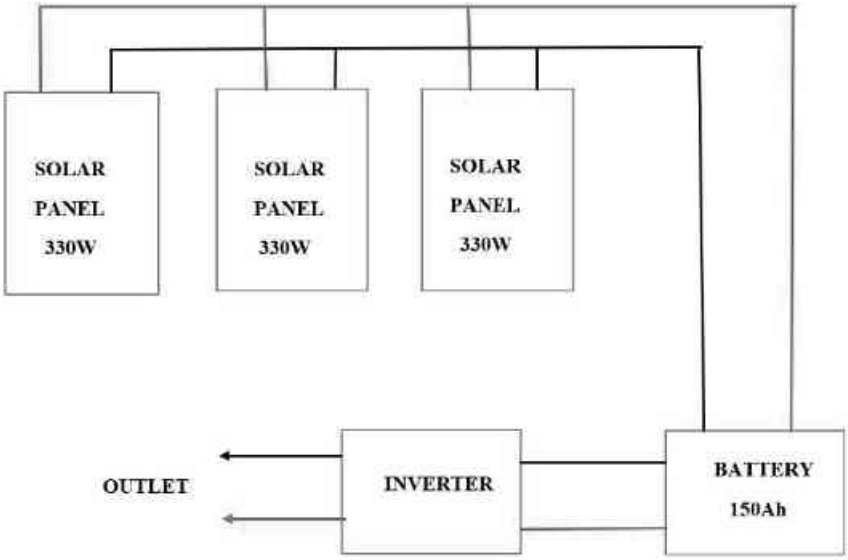


Figure: Block Diagram

III. METHODOLOGY AND DESIGN

Before we continue to the method involved with assembling, it's important to have some information about the task plan vital for plan the undertaking prior to beginning the assembling. When a new product or their elements are to be designed, a designer may proceed as follows:

1. Make a detailed statement of the problems completely; it should be as clear as possible & also of the purpose for which the system is to be designed.
2. Select the material best suited for each element of the system.
3. Determine the allowable or design stress considering all the factors that affect the Strength of the system part.
4. Identify the importance and necessary and application of the system.
5. Problems with existing requirement of the system productivity and demand.
6. Determine the size of each element.
7. Drawing of system.

As per design procedure the solar charging station work has been carried out.

The prime units are Solar Panel, Battery, Inverter, MC4 Connector. The specifications and motive of some major components used in the project are presented in Table 1.

Table 1: Properties Of Major Components

Name	Purpose and Rating
Solar panel	330Watt 3 solar panel are used in this system. Its output voltage and current are 46.3V and 9.24 A, respectively.
Battery	We used UTL Solar Battery of 150Ah and 12 Volt.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

Inverter	We use UTL 1200Volts Inverter.
MC4 Connector	For the connection of Solar Panel we use MC4 two in one connector.

IV. HARDWARE IMPLEMENTATION

The proposed EV Charging Station Project is handmade. Simple block diagram of our project is shown above. We design Solar Charging Station of 1000 watt .At one time we can charge minimum 2 electric vehicle by using the solar. solar panel module is used here which provides an output voltage of 46.3V (open circuit voltage). The output of the solar panel depends on the sunlight.

A. Solar Panel

In this project we have used 330watt 3 solar panel. Solar panel are made up of Silicon, glass, Aluminum Material.

Dimension of each solar panel are 956*992*36 mm. Rated Peak Power is 330 watt per Solar Panel. The rated voltage of solar panel is 38.00 Volts and Rated Current is 8.70 Amp. The open circuit voltage of solar panel is 46.03 Volts and short circuit current is 9.24 Amp.

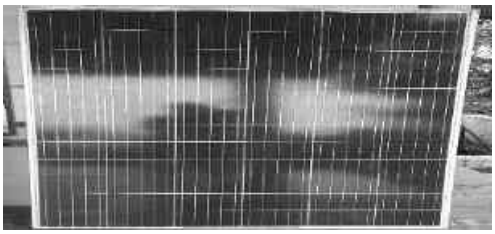


Figure 2: Solar Panel

B. Battery

For this project we use UTL USTI1560 model Battery. The capacity of battery is 150Ah. Initial Charging Rating is 15 Amp and Normal Voltage Rating is 12 Volts. The size of battery is 52cm* 31cm* 28cm and total weight of battery is 70Kg.

Figure 3: Battery

C. Inverter

Figure 4: Inverter

A power inverter, inverter is a power electronic device or circuitry that changes direct current (DC) to alternating current (AC). The subsequent AC recurrence got relies upon the specific gadget utilized. Inverters do something contrary to rectifiers which were initially enormous electromechanical gadgets changing AC over

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

completely to DC. The information voltage, yield voltage and recurrence, and by and large power dealing with rely upon the plan of the particular gadget or hardware. The inverter creates no power; the power is given by the DC source. We utilize the Inverter of 1200V. Model is HL1650. The DC voltage is 24 Volts DC. The result voltage is 230 Volts single stage.

D. MC4 Connector

For the Making Connection to the solar panel we use the MC4 two in one connector. The specification od the MC4 Connector are as following :

Table 2: Specification Of Mc4 Connector

Maximum Current	45 A for 4 sq.mm
Maximum Voltage	1000 V
Rated Impulse Voltage	8 kV
Test Voltage	6 kV (50 Hz, 1 min)
Protection Class	Class II
Application Class	Class A
Flammability Class	UL94-V0
Upper limit temperature	100 deg C
Connecting cable cross section area	2.5, 4, 6 sq. mm
Temperature range	40 deg C to + 105 deg C
Lock mode	Self locking
Contact material	Copper Tin Plated

Figure 5: MC4 Connector

E. Installed EV Charging Station

Figure 6: Installed Charging Station

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

V. RESULTS

Figure 7: Battery

Figure 8: Battery Connection

Figure 9: Output Result

In this project we successfully charge the electric vehicle . The charging time required for full battery charging of electric vehicle is around 3 hours. In one day we can charge maximum 4 electric vehicles. By using solar energy we can charge the electric vehicles. So we can save save money which are spend for electricity. It is eco-friendly, pollution free. For this no need of special space, we can install this project on roof of our house.

VI. CONCLUSION

We have taken up this undertaking as real venture, as we greater inquisitive inside the discipline. We began our paintings in this assignment going through new hurdles first of all. After the of completion of the mission work we attempted its operating in our college machine keep and we have been pleased to be aware that it does meet the necessities for what it is supposed. The maneuverability of the mission is pretty suitable. For industrial motive you'll be able to improve the efficiency of the gadget correctly by way of increasing the scale of the machine.

VII. REFERENCES

[1] Sheikh, Mohr Rizwan &Sheikh, Sirajuddin & Waghmare, Santosh & Labade, Suvarna & Tekale, Anil. (2017). A Review Paper on Electricity Generation from Solar Energy. International Journal for Research in Applied Science and Engineering Technology. 887. 10.22214/ijraset.2017.9272.

[2] Kabir, Ehsanul & Kumar, Pawan & Kumar, Sandeep & Adelodun, Adedeji & Kim, Ki-Hyun. (2017). Solar energy: Potential and future prospects. Renewable and Sustainable Energy Reviews. 82. 10.1016/j.rser.2017.09.094.

[3] Falvo, Maria & Sbordone, Danilo & Bayram, I. Safak & Devetsikiotis, Michael. (2014). EV charging stations and modes: International standards. 2014 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2014. 1134-1139.
10.1109/SPEEDAM.2014.6872107.

[4] M, Brandl & H, Gall & M, Wenger & Lorentz, Vincent & Giegerich, Martin & Baronti, Federico & G, Fantechi & Fanucci, Luca & Roncella, Roberto & Saletti, Roberto & Saponara, Sergio & A, Thaler & Cifrain, Martin & W, Prochazka. (2012). Batteries and battery management systems for electric vehicles. 971-976. 10.1109/DATE.2012.6176637.

[5] Mulhall, P.; Lukic, S.M.; Wirasingha, S.G.; Young-Joo Lee; Emadi, A, "Solar-Assisted Electric Auto Rickshaw Three-Wheeler," Vehicular Technology, IEEE Transactions on , vol.59, no.5, pp.2298,2307, Jun 2010

[6] S. Chatterjee and S. Banerjee, “Upgradation of IC Engine Vehicles to Electric Vehicles,” World Acad. J. Eng. Sci., vol. 7, no. 3, pp. 13–19, 2020.

[7] Mulhall, P.; Lukic, S.M.; Wirasingha, S.G.; Young-Joo Lee; Emadi, A, "Solar-Assisted Electric Auto Rickshaw Three-Wheeler," Vehicular Technology, IEEE Transactions on , vol.59, no.5, pp.2298,2307, Jun 2010

[8] http://en.wikipedia.org/wiki/Photovoltaics– last accessed 27-08-2014

[9] H. LIU, P. ZENG, J. GUO, H. WU, and S. GE, "An optimization strategy of controlled electric vehicle charging considering demand side response and regional wind and photovoltaic," J. Mod. Power Syst. Clean Energy, vol. 3, no. 2, pp. 232–239, 2015, doi: 10.1007/s40565-015-0117-z.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, June 2022
Impact Factor: 6.252

Solar Panel Cleaner Using Vibrator and Air Blower for Desert Location

Pramod Guarav[1], Amruta Salavi[2], Sneha Pavane[3], Pranil Sutar[4], Ritika Hugar[5], Priya Kamble[6]
Professor, Sanjeevan Engineering & Technology Institute, Panhala, Maharashtra[1]
Students, Sanjeevan Engineering & Technology Institute, Panhala, Maharashtra[2,3,4,5,6]

Abstract: *Solar panel is vulnerable to accumulated dust on its surface. The efficiency of the solar panel gradually decreases because of dust accumulation. Accumulation of dust and debris on even one panel in an array reduces their efficiency in energy generation considerably and emphasizes the need to keep the panel's surface as clean as possible. In this paper, a smart panel cleaning system for PV that provides a cost-effective and scalable solution for the removal of soil and dirt. It will automatically and remotely remove the dirt at a fraction of the cost of manual cleaning. In this paper, an Arduino based solar panel cleaning system is designed and implemented for dust removal. The proposed solar panel cleaner is waterless, economical and automatic. Two-step mechanism used in this system consists of an exhaust fan which works as an air blower and a vibration to detached the dust from the panel surface. Since, the system does not need water to clean solar panel, it avoids the wastage of water and effective in desert areas. In terms of daily energy generation, the presented automatic-cleaning scheme provides about 30% more energy output when compared to the dust accumulated PV module.*

Keywords: Solar panel, Cleaning, Efficiency, Dust, Air blower, etc.

I. INTRODUCTION

To ensure sustainable environment, solar energy can play a vital role because it is an enormous, inexhaustible and green source of energy. In commercial level, 10 to 13% conversion can take place in solar cell. Efficiency of outdoor installed PV modules is reducing by 10 to 25% [1]. Efficiency of solar panel is decreases due to the dust. Dust is nothing but particulate matters. Dust consists of substance which present in air and includes smoke, fog. Inorganic and organic substances. Such substances are collected and dust can be formed. Also, dust can be included volcanoes vapors, forest fires, smoke, bacteria, storms, pollen and sand. For long period, dust can be present in air; atmospheric particles which are suspended solid can be included here. Through the wind movements, dust particles can be move and transfer to long distances. Atmospheric condition such as clouds, dust and temperature is affected to solar panel efficiency. Due to the atmospheric condition, all solar energy we can't be use. The mechanism primarily consists of air blower and vibration motion for cleaning on a glassy surface. In our project power loss can be less in amount. Our project is also self-reliant and for use it is very easy.[2]

A water-free automated cleaning service unit, comprising two DC geared motors, a lead screw, supporting shaft, rack and pinion mechanism, and the cleaning task is completed using blower and vibrator. These are hybrid actuators that provide rotary-to-linear motion through suitable mechanical transmission arrangements.[3]

Efficiency of solar panel is depending on the natural condition. So, it is necessary to take care parameters like dust, humidity and temperature. We used Atmega328 board for cleaning of solar panel. Our project includes design and implementation of solar panel cleaner. The actual goal is developed automatic solar panel cleaner. Manually solar panel can be clean but big disadvantage is risk of staff accidents, hard work and man power can be required. To overcome this all disadvantages, we can make automatic solar panel cleaner. It is more effective, smooth cleaning, and avoids the irregularities in the productivity due to the deposition of dust. Our system is work very smoothly.[4]

In recent years, photovoltaic technology has advanced fast for power generation from sunlight. There are mainly three cleaning methods, i.e., mechanical cleaning [5], nano-film based self-cleaning [6] and electrostatic cleaning [7,8]. Compared with other methods, mechanical method has a large dust removal force, rapid operation, good environmental adaptability and control performance.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, June 2022
Impact Factor: 6.252

However, the mechanical cleaning system usually has a bulky and heavy structure owing to its driving components. There are mainly three cleaning methods, i.e., mechanical cleaning [5], nano-film based self-cleaning [6] and electrostatic cleaning [7,8]. Compared with other methods, mechanical method has a large dust removal force, rapid operation, good environmental adaptability and control performance. However, the mechanical cleaning system usually has a bulky and heavy structure owing to its driving components. [9,10]

II. BLOCK DIAGRAM

Figure below shows the block Diagram of Solar panel cleaner. For cleaning solar panel, we design and develop the system. The system works in vertical direction. For cleaning the dust, we are going to use two techniques. One is by using a blower and other is by using the vibrator the dust is cleaned. We can use a DC air blower for this purpose. The vibration motion is generated by the series of high-speed DC motors. There will be off-centered loads connected to the motor shafts which will cause the vibrations. There Whole system is controlled using microcontroller. The logic supply and motor supply are designed differently to avoid damage of the controller. The microcontroller used is Atmega328. The cleaning process is repeated twice a day; for that purpose, we will use a RTC IC module which will keep track of the time. RTC is a real time clock.

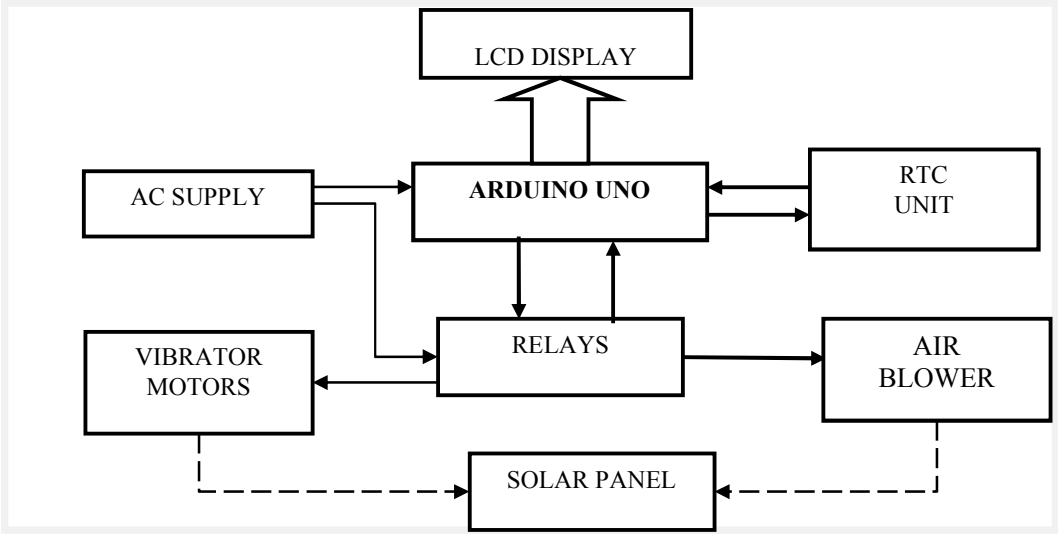


Figure 1: Block Diagram

III. METHODOLOGY AND DESIGN

The proposed solar panel cleaning system uses two-step cleaning techniques. First, vibration is start for deatched the dust from the surface of the panel, vibration purpose we used dc motors. Then air blower removes dust from surface of the panel using up-down structure as much as possible. For up-down mechanism we used two dc motors. This system is time based system. Therefore, no water is needed for the system for cleaning. This feature keeps the solar panel safe from scratch. The proposed solar panel cleaning system is fabricated with easily accessible components. The prime units are solar panel, microcontroller (Arduino Uno), DC motors, Air blower, Relays, LCD, Real time clock. The specifications and motive of some major components used in the proposed cleaning method are presented in Table I.

TABLE I: PROPERTIES OF MAJOR COMPONENTS

Name	Purpose and Rating
Solar panel	A 40W solar panel is used in this system. Its output voltage and current are 18.20V and 2.20 A, respectively.
Arduino UNO	We used ATmega328 microcontroller, its input voltage is 7-12v.
Air blower	Air blower is used for cleaning to blow out the sand on the surface of the solar panel.
Dc Motor	Dc motor is used for vibration, blower and up-down mechanism.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, June 2022
Impact Factor: 6.252

Relay	We used 4voltage relays for vibration, blower, up & down mechanism
Real time clock	The DS1307 serial real time clock is a low power, full binary-coded decimal (BCD) clock/calendar plus 56 bytes of NV SRAM.

Some other components are used in this system as supporting components. We were marked the air blower with the help of cpu exhaust fan, dc motor using pvc pipe. This blower sucks the outside air and blow towards the panel surface to move out the dust from surface. The vibration motion is generated by the series of high-speed DC motors. There will be off-centered loads connected to the motor shafts which will cause the vibrations. Push button is also utilized here to set the limit of the movement of the cleaning Mechanism. Blower is used to remove the dust from the surface of the solar panel. The complete circuit diagram of the proposed solar panel cleaner is shown in Figure 1.

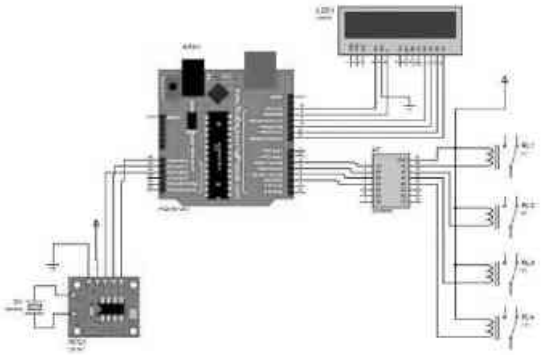


Figure 2: Complete Circuit Diagram of Proposed System

The Arduino uno are shown in the middle of the diagram which has 6 pins connected to the LCD (LM016L), 4 pin connected to IC (ULN20034) & 3 pins connected to RTC(DS1307). We give the supply to the Arduino and relay is 12V & 9V respectively. Ic connection goes to voltage relays which is parallely connected.

IV. HARDWARE IMPLEMENTATION

The proposed solar panel cleaning system is automatic and handmade. Simple architectural design is seen in this system including solar panel, cleaning mechanism. A 40W solar panel module is used here which provides an output voltage of 18.20V (open circuit voltage). The output of the solar panel depends on the sunlight. If we start with the body structure of the system. We designed the cleaner with a body that is made from iron.

A. Air Blower

In this system we have used a pvc pipe of 63.5 mm and two end caps to seal it's ending, a combination of exhaust fan and motor to suck in the air and then release it through the holes that are provided in the pvc pipe and this mechanism acts as a blower which is used to blow away the dust/sand that has accumulated on the solar panel.

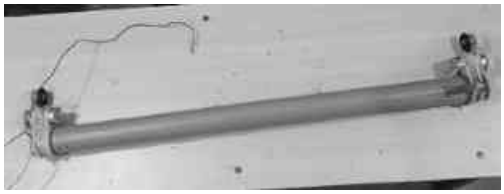


Figure 3: Air Blower

B. Frame

The frame which is made by iron to support our system, underneath it we have connected a motor of 35000 RPM and off-centered load is connected to the shaft of the motor so due to which it provides vibration to our solar panel so that the larger partical of sand/dust slides down without damaging the solar panel. We have also used a rack and pinion to hold and provide linear moment of blower by using two motors of 30 RPM, they are rotated clockwise and anti-clockwise for the up and down moment of the blower.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, June 2022
Impact Factor: 6.252

Figure 4: Frame

C. Electronic Circuit

To make the time based system we have used an ArduinoUNO which has 16 pins, D7(8th pin) - RS(13th pin) is connected to LCD display (LM016L), 5th pin- 2nd pin is connected to ULN2003 pin 1st pin-4th pin which is a used to amplify current cause relay can't be directly connected to Arduino, ULN2003 pin 9th pin- 16th pin is given to relay 1 [vibration], 9th pin -15th pin for relay 2 [blower], 9th pin - 14th pin for relay 3 [up moment], 9th pin - 13th pin for relay 4[down moment]. This system does clean twice a day to save energy we have used real time clock (RTC) to determine the timing of cleaning, VCC to RST is connected to A0 to A2. For better control of our blower, we have taken out two push buttons for UP and down moment.

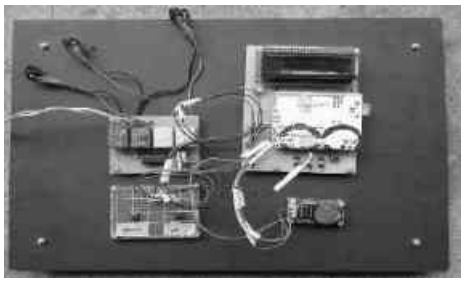


Figure 5: Electronic Circuit

D. Proposed System

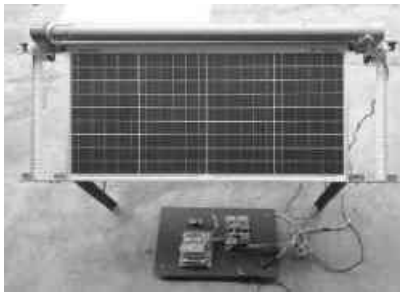


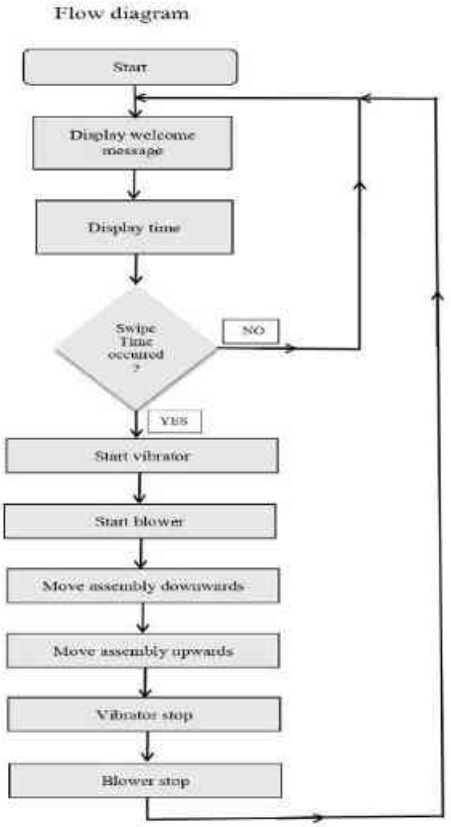
Figure 6: Proposed System

This time-based system is controlled by Arduino which is connected to LCD display which shows us the time at which cleaning is supposed to be done. RTC is used for the time management and to let Arduino know when the cleaning has to be done, four voltage relays are used respectively for blower, vibrator and for up and down moment. When the time of cleaning that's given to Arduino occurs the motor used as vibrator starts and the frame of solar panels starts to vibrates so the larger partials of dust/sand slides down, when blower starts to move downwards the small particals are blowen away due to forced air.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, June 2022
Impact Factor: 6.252

TABLE II: COST ESTIMATION OF THE PROPOSED SYSTEM

Components	Price
DC Motor (35000 rpm)	500
DC Gear Motor (30 rpm)	500
Arduino Uno	600
DC Voltage Relay	100
LCD display	170
RTC (real time clock)	150
Rack & pinino	500
PVC pipe	40
End Cap	40
Total cost	2600



Flowchart 1: Flow Chart of the Program Used for Solar Panel Cleaner

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, June 2022
Impact Factor: 6.252

V. RESULTS

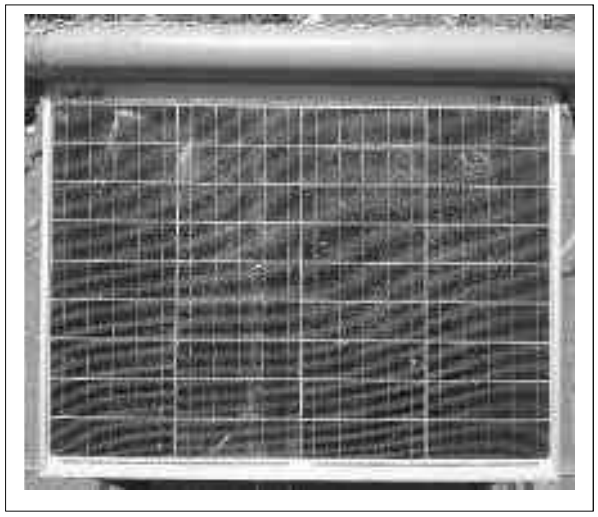


Figure 7: Before Cleaning

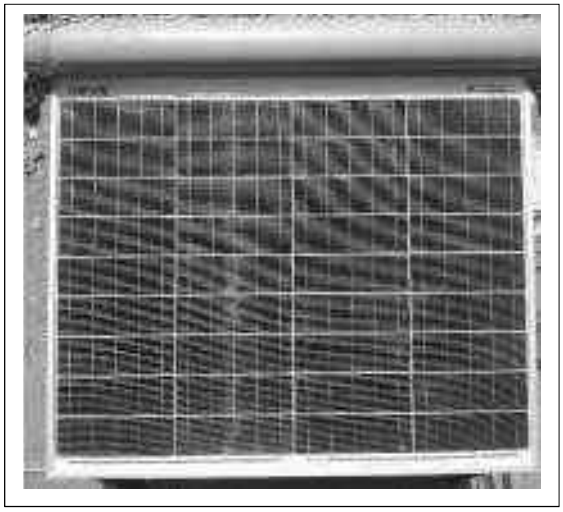


Figure 8: After Cleaning

Before cleaning the dusty solar panel, it's observed that due the dust particles there's decrease in the output of solar panel as dust tents to reduce the solar radiance that's trapped by solar cells and if left without cleaning it might also damage the solar panel. Shading due to dust particles is a huge issue as accumulation of dust on panel as it leads to formation of hot spot on the panel, if a solar cell is shaded due to dust particle no radiation is trapped and the current that needs to be passed doesn't pass and then that current tries to flow through over cell and the load on that single cell increases and it forms a hot spot, it also causes huge damage to solar panel. After cleaning there's increment in the output of solar panel, maximum amount of radiation is captured and later converted to energy which can be utilized in various fields

TABLE III: RESULTS

Day	Time	Voltage before cleaning (volt)	Current before cleaning (amp)	Voltage after cleaning (volt)	Current after cleaning (amp)	Calculated power before cleaning (watt)	Calculated power after cleaning (watt)	Efficiency increased (%)
1	10.00 AM	19.5	0.55	20.0	0.54	10.725	10.8	0.6
	2.00 PM	19.4	0.53	19.8	0.536	10.282	10.6128	3.21
2	10.00 AM	19.3	0.53	19.76	0.53	10.229	10.47	2.35
	2.00 PM	19.5	0.54	19.9	0.54	10.335	10.746	3.91
3	10.00 AM	19.4	0.53	19.8	0.53	10.282	10.494	2.02
	2.00 PM	19.55	0.54	20.0	0.54	10.557	10.8	2.30
4	10.00 AM	19.3	0.535	19.4	0.54	10.32	10.47	1.45
	2.00 PM	19.5	0.54	20.0	0.54	10.53	10.8	2.56

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, June 2022
Impact Factor: 6.252

Result Analysis

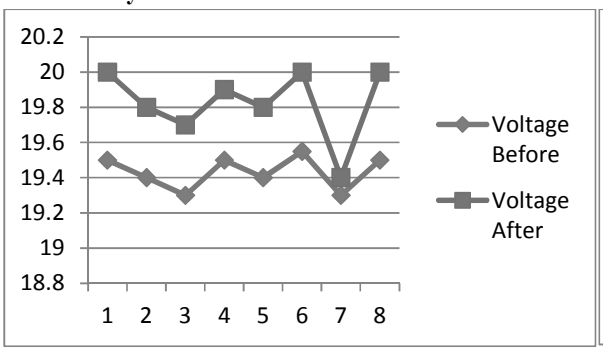


Figure 9: Voltage

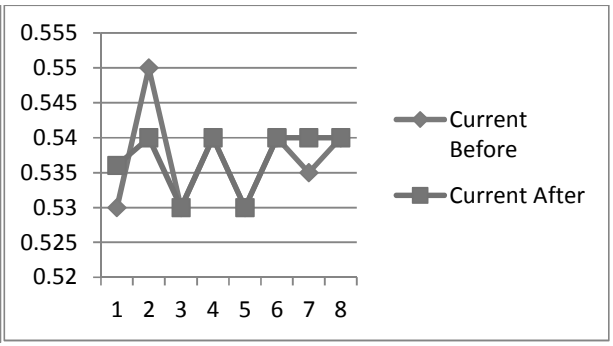


Figure 10: Current

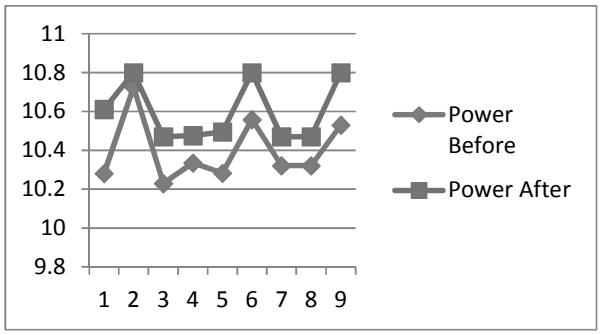


Figure 11: Power

VI. CONCLUSION

To ensure complete use of the radiated solar energy, one needs to ensure that the solar panel is cleaned. Cleaning the solar panel everyday seems difficult and overrated. Hence automatic solar cleaning finds application which also ensures the increased production of energy. Our system can be installed on single solar panel. The cleaning action of blower and vibrator nicely works in vertically direction. After using our system, we can conclude that there is 2 % of increment in the efficiency. Our system becomes benefited for smaller solar panel located in desert and dusty areas.

REFERENCES

[1]. R.G. Weliwaththage and S.P.R. Arachchige, "Solar Energy Technology" (2020), ISSN 2714-1837

[2]. Md. Rawshan Habib, Md Shahnewaz Tanvir, Ahmed Yousuf Suhan, "Automatic Solar Panel Cleaning System Based on Arduino for Dust Removal" (2021)

[3]. Redekar, A.; Deb, D.; Ozana, S. Functionality Analysis of Electric Actuators in Renewable Energy Systems—A Review. Sensors 2022, 22, 4273. https://doi.org/10.3390/s22114273

[4]. Lu, X.; Zhang, Q.; Hu, J. A linear piezoelectric actuator based solar panel cleaning system. Energy 2013, 60, 401–406. https://doi.org/10.1016/j.energy.2013.07.058.

[5]. Sorndach, Thanapon, Noppadol Pudchuen, and Pornsak Srisungsitthisunti. "Rooftop Solar Panel Cleaning Robot Using Omni Wheels." (2018)

[6]. Jaradat, Mohammad A., Mohammad Tauseef, Yousuf Altaf, Roba Saab, Hussam Adel, Nadeem Yousuf, and Yousef H. Zurigat. "A fully portable robot system for cleaning solar panels." In 2015 10th International Symposium on Mechatronics and its Applications (ISMA), pp. 1-6.

[7]. Kawamoto, Hiroyuki, and Takuya Shibata. "Electrostatic cleaning system for removal of sand from solar panels." Journal of Electrostatics 73

[8]. Aravind, G., Gautham Vasan, TSB Gowtham Kumar, R. Naresh Balaji, and G. Saravana Ilango. "A Control Strategy for an Autonomous Robotic Vacuum Cleaner for Solar Panels." In 2014 Texas Instruments India

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, June 2022
Impact Factor: 6.252

Educators' Conference (TIIEC), pp. 53-61. IEEE, 2014

[9]. A. S. Alghamdi, A. S. Bahaj, L. S. Blunden, and Y. Wu, "Dust removal from solar PV modules by automated cleaning systems," Energies, vol. 12, pp. 1-21, 2019.

[10]. K. P. Amber et al., "A self-cleaning device for pole mounted solar photovoltaic installations," Thermal Science, vol. 23, no. 2A, pp. 739- 49, 2019.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

TRANSMISSION LINE MONITORING SYSTEM USING IOT

Sakshi Powalkar[*1], Pranali Kamble[*2], Mayuri Khilare[*3], Akshata Kamble[*4], Arvind Bhandare[*5]

[*1,2,3,4]B.Tech Student, Electrical Engineering, Sanjeevan Engineering And Technology Institute Panhala, Kolhapur, Maharashtra, India.

[*5]Asst. Professor, Electrical Engineering, Sanjeevan Engineering And Technology Institute Panhala, Kolhapur, Maharashtra, India.

ABSTRACT

The electrical power system is growing and complexity in all sectors such as generation, transmission, distribution, and load systems. The detection and location of faults on power lines is essential to the protection and maintenance of a power system. In an electrical power system, a fault current is an abnormal electric current. In this system, some device uses like sensors to sense the current (in amp) and voltage (in volt) continuously of transmission line. Our system will detect if any voltage drops or overload on transmission line, if any these types of faults occur it can detect it and trip the line by using relay. Furthermore, if there are thefts occurs on line it can be detected automatically and intimated to the authority person with location by using Internet of Things. Location of theft is essential in case of power system. Detection of fault in the transmission line has been proposing by programming Arduino UNO and Arduino MEGA. Arduino senses the change in current and voltage as per programming and provides information to LCD. The device is measures incoming and outgoing values and find abnormalities with the help of sensors. Fast monitoring can help to protect power system. This is the concept of impedance method fault detection system. This fault and detection of theft is very fast.

Keywords: Internet Of Things, Arduino UNO, Arduino Mega.

I. INTRODUCTION

Modern electric system is growing up exponentially [1]. Electrical power transmission line is a critical link between power generation plants and distribution to all electricity users. Length of transmission line is long and there is a possibility of fault occurrence. These faults cause giant damage to expensive equipment and damage stability [2]. So, fault should monitor quickly and isolate faulty line. It is important to protect the transmission system. Sensors can take accurate measurement of an electrical parameters and transfer information to IOT. Sending information to control room in appropriate time is a difficult challenge [3]. The theft of electricity is a big problem of power system. Theft is the major concern of the transmission and distribution losses in the supply of electricity [4]. All electricity companies face this issue and losses money every year due to theft. Electricity is being stealing with bypassing. This system is utilizing to overcome this type of losses of electricity, and it is very beneficial for the authorized agency to control its revenue loss. Proposed system is uses for identifying faults, thefts and if there is any fault occurs line will trip or isolate immediately, this work is complete by relay operation. It will protect transmission line against damage. Recommended system also detect theft, if there is any taping online for electric power theft it will intimate to the authority person of control room with location by using Internet of Things (IOT) system. Detection of theft is integrating with IOT mechanism. Thus, we must take care of transmission line to reduce losses for efficient system, this proposed work, i.e., IOT based transmission line fault detection system may be the solution [5]. Most methods of fault detection and location based on measurements of electrical quantities provided by current and voltage transformers [6].

II. METHODOLOGY

a) Current methods-

1) Impedance based fault location method

In the impedance-measurement-based technique, the voltage and current during pre-fault and post fault are analyzed. Parameters of the line can be calculated with the transmission line model. Impedance-based methods required the following approach.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

- Measure the values of voltage and current phasors.
- Extract the fundamental components.
- Determine the fault type.

2) Travelling-wave-based fault location

A fault occurring on a power cable will generate voltage and current travelling waves with wideband signals which cover the entire frequency range. Then, at this point, both a reflection and a refraction of the wave will occur. This generates additional waves which will propagate through the power system. In the travelling wave technique, either the transient created by a fault is captures are injecting into the line. In this technique, either the transient created by a fault is capture or impulses are injecting into the line. And the reflected travelling wave is detecting with time domain reflectometry. The fault location is then determining by timing analysis of the travelling wave.

In this paper, the proposed model monitors parameters like current and voltage. Also detect theft and faults like under voltage and overload. In this monitoring system, flow of charge sense by current sensor and voltage sensor. From these sensors, fault, and theft will detect. It will detect by taking difference of current between two transmission poles, input, and output current reading. All system is work by programming in Arduino.

b) Block Diagram

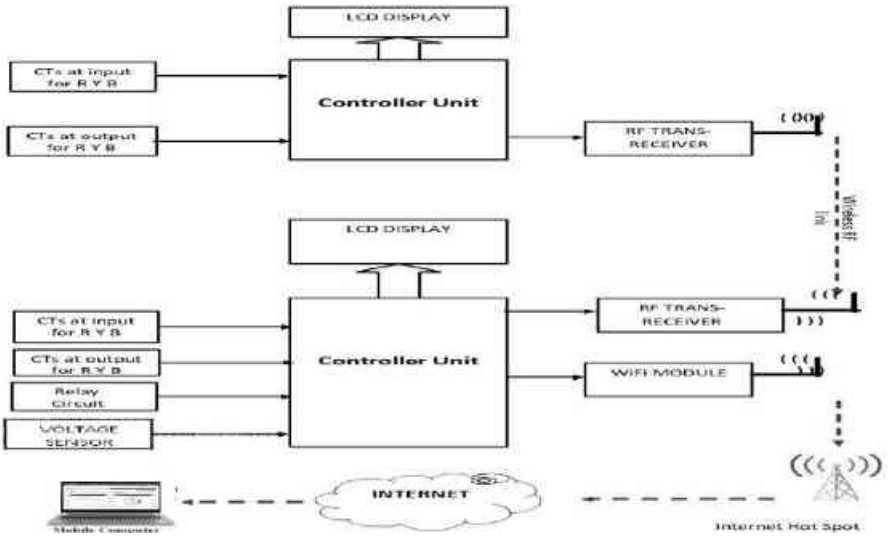


Figure 1: Proposed system Block diagram

c) Circuit Diagrams of Slave circuit and Master circuit

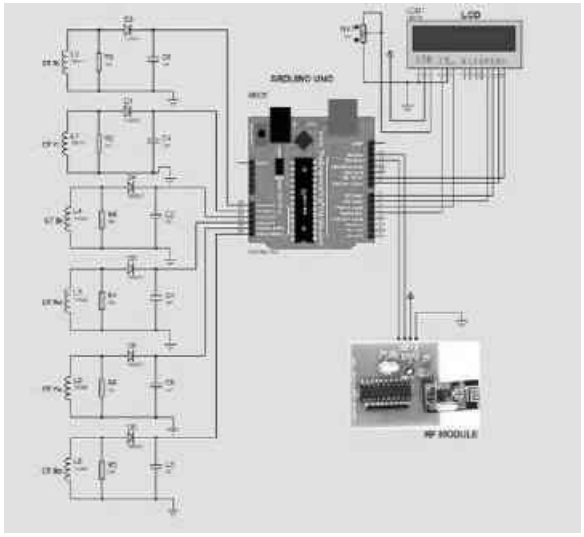


Figure 2: Circuit Diagram of Slave Circuit

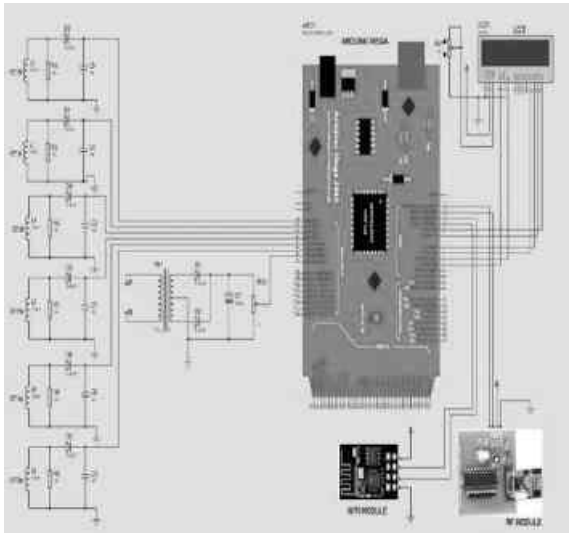


Figure 3: Circuit Diagram of Master Circuit

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

d) System Flowcharts

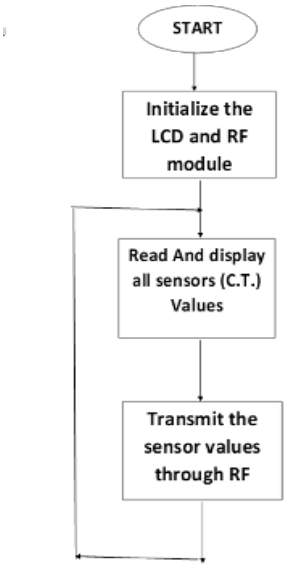


Figure 4: Flowchart of Slave Circuit

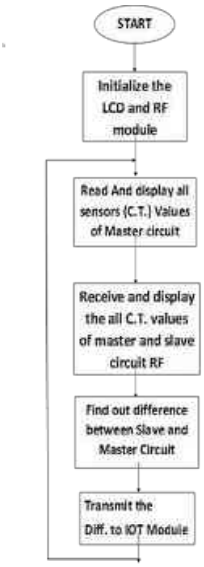


Figure 5: Flowchart of Master Circuit

Flowchart of Slave Circuit

Firstly, power supply on then microcontroller will initialize. Then RF module and LCD will initialize. LCDs all sensed values by sensor. And then transmit the all values through RF module to Mater. After that, all slave circuit will work.

Flowchart of Master Circuit

Power supply on then, initialization of LCD is done. Read and display all sensors values of master circuit. And receives all values from slave circuit through RF module and read. Then compare the master and slave reading. And transmit to IOT module. After that, master circuit will work.

e) Actual working

Designed work divided in two parts. One part is called the “Slave system” and the other part is called the “Master system”. In the actual system there will be many slave systems in a particular area but a single Master system that will control all the slaves. All the systems will be mounted on each of the electricity distribution pole. The master system will be located at the central pole and slaves will be on the surrounding poles. The purpose of the slave is to monitor the current flow on the transmission line for that particular pole. We will use the current sensors for this. It will measure the current flow on the transmission line in two parts, one is incoming current to the pole and the other is outgoing current from the pole. Both the currents values may be different as there may be authorized electrical connection going to a consumer from that pole. Another task of the slave is to transmit those current values to the Master system over a wireless RF link. For this purpose, we are going to use RF trans-receiver modules. The master system will also measure the incoming and outgoing current on the master pole. It will also collect the current values coming from all the slaves over the RF links and also monitors voltage of all three phases (R, Y, B). The master system will arrange all those current values in a sequence in which the actually current flows through each of the current sensors. The main task of the master is to find out difference between outgoing current of each pole and the incoming current consecutively next pole for every phase wire. Like this it will detect the leakage/theft of the power in the transmission line. A IoT modem can be used to send the message to the area supervisor of that particular area using the WIFI system. This data can be viewed on the website by anyone. There will be 6 CTs on each pole in total, 3 for incoming current measurement of each phase (R Y B) and 3 for outgoing current measurement.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

f) Implementation

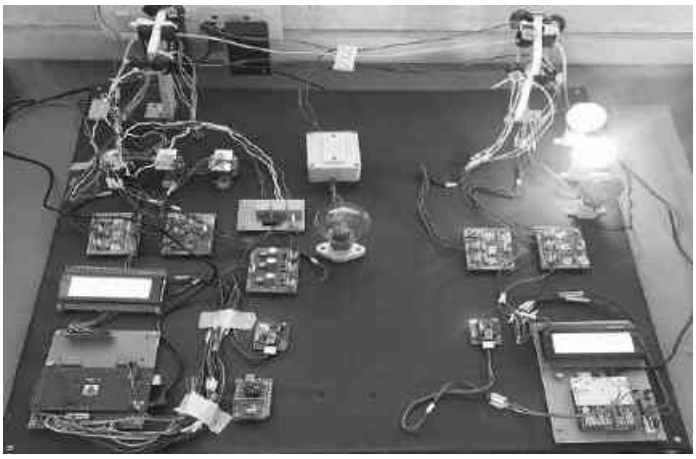


Figure 6: Implementation

III. RESULTS AND DISCUSSION

Fault Detection

1. Normal Condition of Voltage of Transmission Line

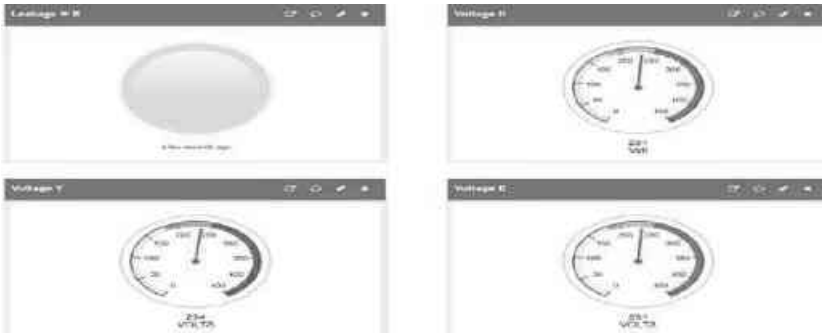


Figure 7: Voltage Readings of phase R, Y, B.

Above diagrams displays the value of voltage of phases. It shows that Transmission line is in normal conditions. These all values are displayed on thingspeak website. There is voltage R is value of phase R in volt, voltage Y is value of phase Y in volt and voltage B is value of phase B in volt. If any fault occurs like Under voltage or over voltage this system will indicate that with help of thingspeak.

2. Under voltage fault detection

2.1 R phase Under Voltage

Figure 8: R phase Under Voltage Fault detection

2.2 Y phase Under Voltage

Figure 9: Y phase Under Voltage Fault detection

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

2.3 B phase Under Voltage

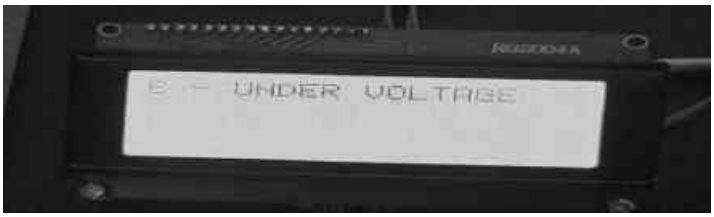


Figure 10: Y phase Under Voltage Fault detection

3. Normal Condition of Current in Transmission line

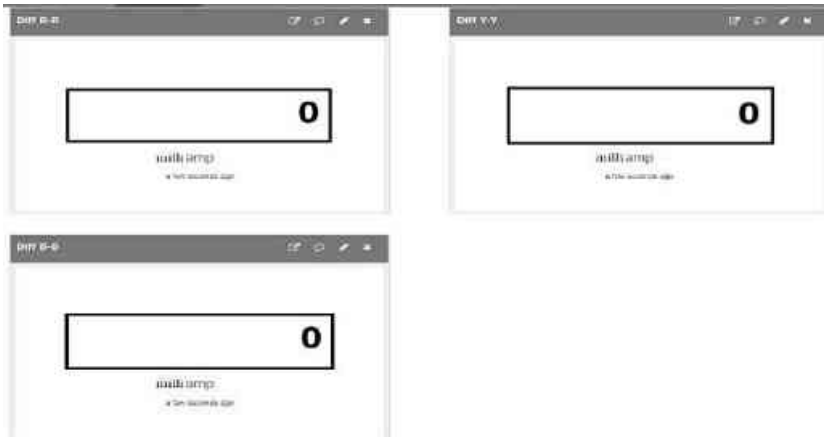


Figure 11: Normal Current Readings

4. Overload Fault detection

4.1 Overloading on R phase

Figure 12: overload fault detection of R phase

4.2 Overloading on Y phase

Figure 13: overload fault detection of Y phase.

4.3 Overloading on B phase

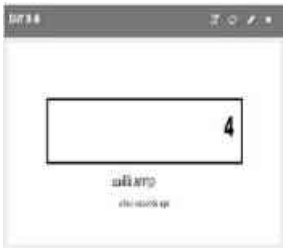


Figure 14: overload fault detection of Y phase.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

All of above figures shows the overload fault detection on LCD of master circuit and on Thingspaek website. If the load of transmission line increases (by 100watt in this model system), system will indicate values of current in milli ampere. When 100watt load is connected to load side then value of current in 0.4 ampere. All values of current are shown is accurate. After fault occurrence system will trip transmission line automatically.

5. Theft Detection

5.1 Normal condition

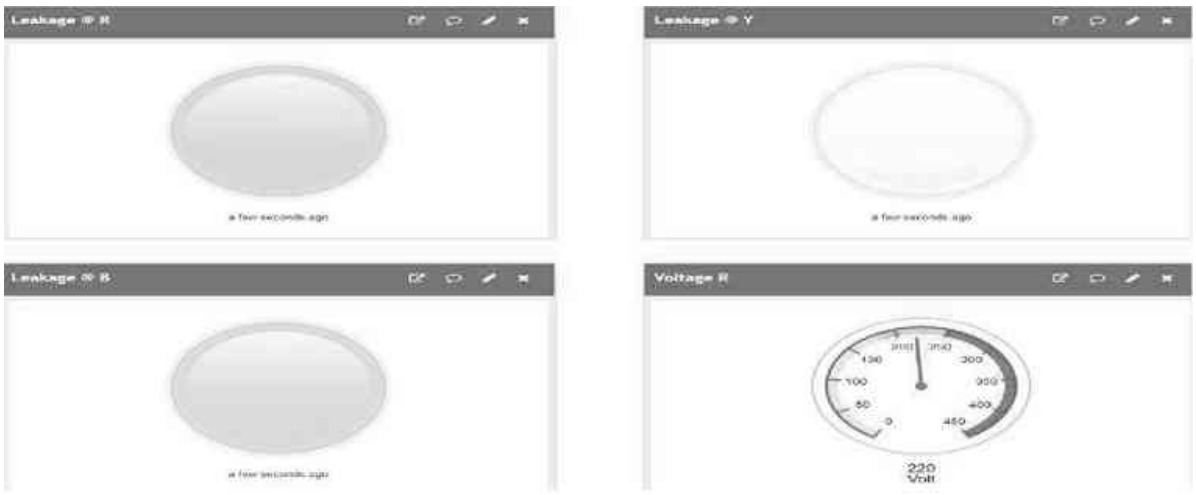


Figure 15: Normal condition on line

5.2 Theft on R phase

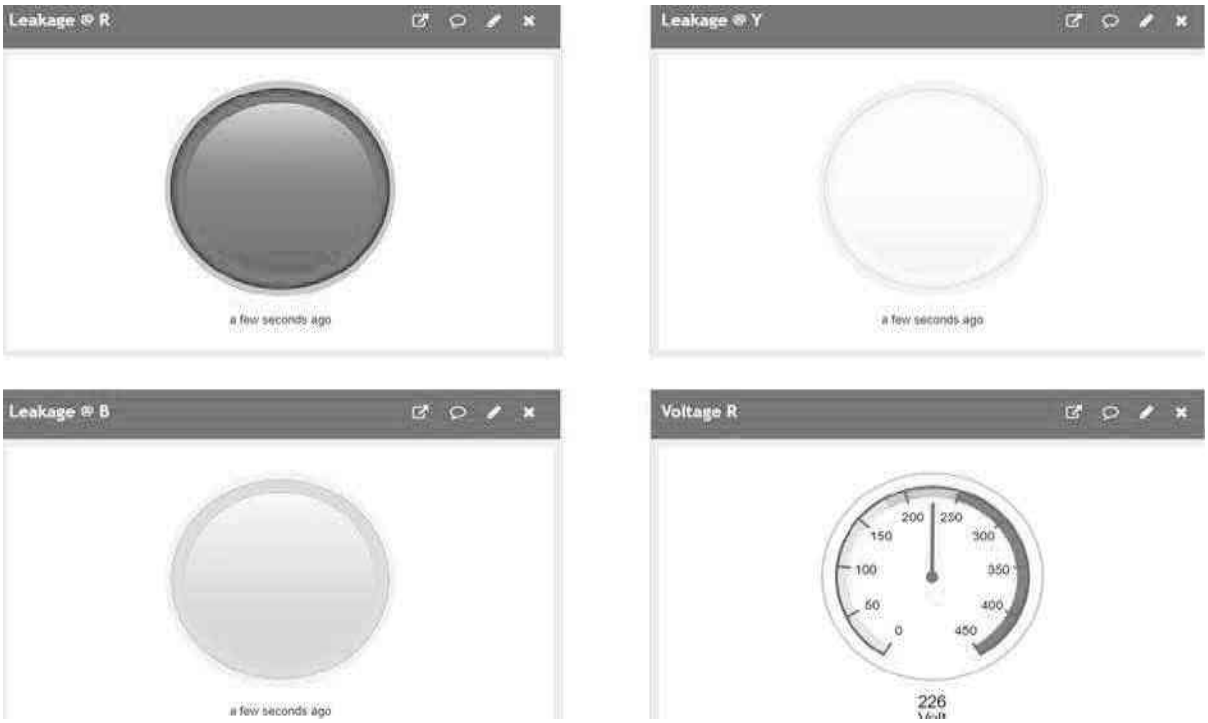


Figure 16: Theft detection

If there is tapping on any phases, it will automatically intimate to the authorized person. With indicator glowing. If there is any tapping on line, it can be automatically detected and intimated to the authority person with location of theft by using IOT. There is we used switch and 60-watt bulb for theft.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

5.3 Location of Fault and Theft

Figure 17: Fault and theft location

IV. OBJECTIVES

- Transmission line faults are very dangerous and due to fault losses increases. So, this system may help to solve this problem.
- For security of expensive appliances under power system.
- The under voltage and over current fault and theft detection.
- To find exact fault location where fault or theft occur.
- To minimize the time require finding location.
- Decreases the overall maintenance cost by providing instant information about fault.

V. CONCLUSION

Designed model will easily detect the fault and theft. It is very fast system. All monitored data will update to cloud and records all data. Proposed system is integrated with IOT. So, it will use for avoiding future problems. We can also message to authorized person or consumer in case of theft or any fault occurs on line by using GSM. And by using different loads like capacitive load and inductive load, we can measure active power and reactive power.

VI. REFERENCES

[1] M. Monica a, *, P. Sivakumar a, S. Sivani a, D. Sandhiya a, J. Shameem Fathima a, S. Hithesh Kumar Overhead Line Fault Detection and Control using Internet of Things (IoT).

[2] N. Dhanalakshmi and Dinesh Reddy Sunkari. Design Of IOT Based Transmission Line Fault Monitoring System.

[3] Minal Karalkar1, Sushrut Adlok2, Ankit Ramteke3, Sumit Parchake4, Rajat Tawade5, Sujata Manwar6, Shubham Wankhade7 Transmission Line Fault Detection using IoT.

[4] Kumbhar Nilam P., Kashid Hema D., Pise Rasika R., Prof.R.A.Kharade. System for Burglary and Tamper Prevention in Distribution of Electricity.

[5] Akash Chatterjee, Avijit Maitra, Biswaroop Saha, Debopam Chakraborty, Mouli Karmarkar, Sandipan Ganguly, Tiyasha Patra, Suparna Paul, Indranath Sarkar. Fault Detction system of transmission line using IOT.

[6] L.Sakthivel, V.Logash, G.Tamil selven, C.Mohandhass. Monitoring and Fault identification of three phase Transmission line using Internet of Things (IOT).

International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 07 | July - 2022 Impact Factor: 7.185 ISSN: 2582-3930

Automatic Source Selector with Real Time Battery Parameter Monitoring

Akash Sadashiv Patekar[1], Jadhav Dinesh Digambar[2], Prajval Sanjay Patil[3],

Manjunath Murlidhar Kamble[4] , Siddhant Maruti Khot[5], Metakari Vishal Tukaram[6]

Student, Electrical Engineering Sanjeevan Engineering & Technology Institute[12345]
Professor, Electrical Engineering Sanjeevan Engineering & Technology Institute[6]

Abstract: Source selection is the problem of identifying a subset of available data sources that best meet a user's needs. In this paper we propose a user-driven approach to source selection that seeks to identify sources that are most fit for purpose. The monitoring board measure the battery parameter using the divider circuit and series resistor And this measured data send to blink app by esp8266 wifi module. The Source Selector circuit using monitoring board measured parameter's Collected data is Compared with permissible limits in ATmega328P. According to this data ATmega328p gives signgal to the relay to operate operate load.

I Introduction

For a very long time, power outages, power interrupts and also unexpected routine power line maintenance is one of the major problems faced in industries, hospitals, offices, and homes whole over the world. For that case, this project provides an automatic operation of electrical power distribution systems; the rapid and reliable transfer of the system from one power source to another during specific events such as power outages, power interrupts, routine power line maintenance, to achieve the reliability of such systems. Electrical power supply is one of the primary essential needs of human life today, that is to say, without electrical power supply, most human works become stand still, postponed and even cancelled since most human actions are dependent on the electrical power supply. Furthermore, the need for power supply through access to electricity by the masses of the population of any country, both developed and developing countries is very important to the development of the economy of that particular country.

In other words, the power sector plays an essential role in the social economic development of any country. Why Is Battery Monitoring Important? Battery monitoring is important because it helps to predict the state of health and inevitable failure. Depending on battery type and application, Lead Acid batteries have a design life that can range dramatically - from 5 to 20 years. That design life estimation is based on the battery being maintained in accordance with recommended practices, operating under ideal conditions and ensuring that any individual failing units are replaced before they impact the other units in the string. However, in most installations, those conditions are seldom met, and the actual life of a battery may be closer to half of the published design life. This potential for failure has been confirmed in a number of studies over the years. In fact, in one study into Data Center failures, the UPS Battery was responsible for over 50% of the reported outages. This data, and the uncertainty of most operating environments, confirms why battery monitoring is an essential part of maintaining. The project is designed to automatically supply continuous power to a load through one of the four sources of supply that are: solar, mains, generator, and inverter when any one of them is unavailable. Four switches are used for four respective sources. These are connected to a microcontroller of 8051 family that provides input signals to it. Whenever a switch is pressed it shows the absence of that particular source. A relay driver is used that receives microcontroller generated output and switches that particular relay to provide continuous power supply. A lamp is used as a load for demonstration purpose which draws power from main. When main fails to supply power, automatically next available source is used say inverter. If inverter fails then the next one is used and so on. An LCD is also used to display which source is being currently used for power supply. Therefore, this project provides an effective solution to provide an alternative power supply during frequent power cuts.

II Literature Survey

The unreliable public power supply has led many to the alternative power supply sources .manual changeover switch system still remains the oldest changeover switch box used by majority of the electricity consumers. Manual changeover switch box separates the source between a system

supply and solar supply. [3] Robert L. Boylestad and Louis Nashelsky Electronic devices and circuit theory Eight edition. Prentice Hall (Pearson Education Inc.) 2002 pp 875 Whenever there is power failure, changeover is done manually by an individual and the same happens when the solar power is restored. manual changeover is time wasting whenever there is power failure, it is strenuous to operate because a lot of energy is required, it causes device process or product damage. In fact there are several types of emergency power systems being used all over the world, one of the most used types is the UPS system, also known as an uninterruptible power supply which is an electrical apparatus that provides emergency power to load when input source, typically the main source power fails. It provides near-instantaneous protection from input power interruptions by supplying energy stored in batteries. [1] El-Ali, A., N. Moubayed, and R. Outbib. "Comparison between solar and wind energy in Lebanon." Electrical Power Quality and Utilisation, 2007. EPQU 2007. 9th International Conference. The difference between the circuit that we are about to design is that the UPS's main function is to protect critical loads against the different types of disturbance which may occurs with the power sources by shifting the supply to the backup rechargeable battery. So, the load will have an uninterruptable power supply of power. On the other hand, our project aims to have no interruption on power being supplied to the load by shifting the supply to the backup solar, wind and a generator sources as well as to reduce the financial cost of using such an emergency power system, and that by using the solar and wind power supplies as backup sources because they have low operating cost. Although, the circuit we are attempting to design will work effectively during faults and not in response to small disturbances of power source, but also it has a noticeable benefits. [2] Gagari Deb and Arijit Bardhan Roy, International Journal of Computer and Electrical Engineering, Vol.4, No.1, February 2012.

III Proposed system

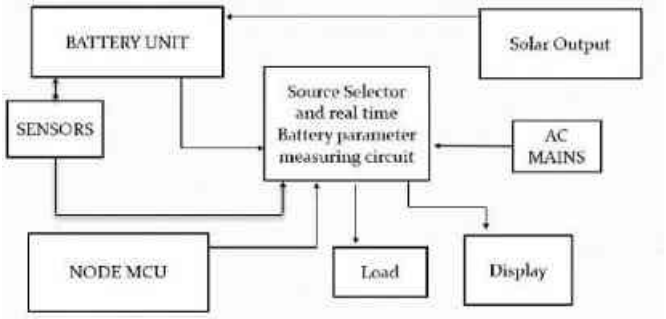


Fig1. Sequence Diagram

This auto power supply control system works on the principle of auto function for switch over the load to other available source without wasting any time or switch off the load. Here for the demonstration purposes we have used voltage divider network for measuring voltage for battery , if it is less than 50% than load is automatically shift to the main supply (MSEB). In this system, the ATMEGA328P microcontroller which is very essential component of this system always, keep sensing the whole available sources. When battery goes lower than permissible value ATMEGA328P shifted the load to the other supply source by giving the signal to the relay driver IC then the relay driver IC switched on the appropriate load relay. The whole function is done by the ATMEGA328P is micro seconds and this shifted time can be changed during the programming of Arduino microcontroller. The load relay consist of NORMALLY OPEN and close contacts and are operated through the relay driver IC. We have checked this system by connecting the Led lamp at output side as a load when any interruption is taking place during the shifted time then the lamp is blinking but here there is no any blinking take place during the shifted time means there is no any interruption in supplying the power at output side. And also we are measuring real time battery parameter like voltage, current, temperature by using voltage divider network, shunt resistance method, and LM35 All these measured parameters are send to android mobile app (BLINK), by using ESP8266.

Battery Parameter monitoring

Battery monitoring is important because it helps to predict the state of health and inevitable

failure. Depending on battery type and application, Lead Acid batteries have a design life that can range dramatically - from 5 to 20 years. That design life estimation is based on the battery being maintained in accordance with recommended practices, operating under ideal conditions and ensuring that any individual failing units are replaced before they impact the other units in the string. However, in most installations, those conditions are seldom met, and the actual life of a battery may be closer to half of the published design life. This potential for failure has been confirmed in a number of studies over the years. In fact, in one study into Data Center failures, the UPS Battery was responsible for over 50% of the reported outages. This data, and the uncertainty of most operating environments, confirms why battery monitoring is an essential part of maintaining. • **Voltage Measurement**

Passive Linear Circuit that produces output voltage that is a fraction of its input voltage. It scales down input voltage to a smaller voltage based on the ratio of the 2 resistors through distributing input voltage among components of the divider. Often used to supply a voltage different from an available battery or power supply. Output voltage of voltage divider is dependent on the resistance of the incoming load

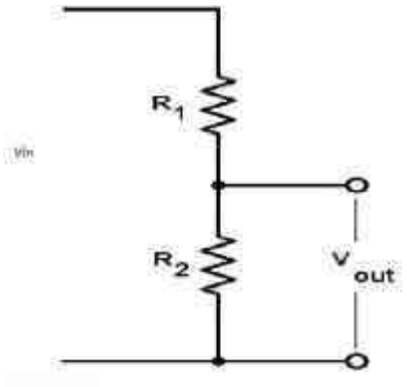


Fig2. Voltage measurement

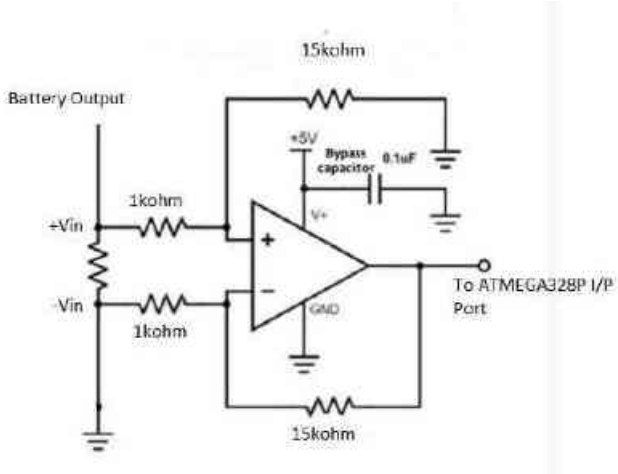


Fig. 3 Current measurement

In principal, a current detection circuit using a shunt resistor is a simple circuit that only measures voltage. However, since the voltage drop of the shunt resistor is small, it's necessary to make a circuit that can amplify the voltage with a high level of accuracy. Therefore, a differential amplifier circuit that uses an operational amplifier is used.

Temperature Measurement

LM35 is a precession Integrated circuit Temperature sensor, whose output voltage varies, based on the temperature around it. It is a small and cheap IC which can be used to measure temperature anywhere between -55°C to 150°C. It can easily be interfaced with any Microcontroller that has ADC function or any development platform like ATMEGA328P • **Source selector** The project is designed to automatically supply continuous power to a load through one of the four sources of supply that are: solar, mains, generator, and inverter when any one of them is unavailable. Two switches are used for four respective sources. These are connected to a microcontroller of 8051 family that provides input signals to it. Whenever a switch is pressed it shows the absence of that particular source. A relay driver is used that receives microcontroller generated output and switches that particular relay to provide continuous power supply. A lamp is used as a load for demonstration purpose which draws power from main. When main fails to supply power, automatically next available source is used say inverter. If inverter fails then the next one is used and so on. An LCD is also used to display which source is being currently used for power supply. Therefore, this project provides an effective

solution to provide an alternative power supply during frequent power cuts.

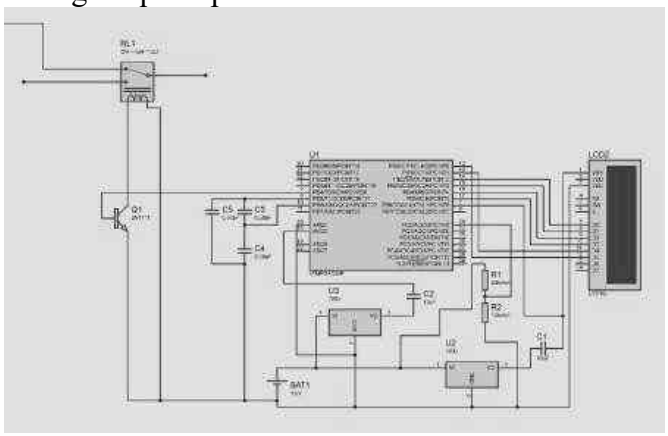


Fig.4 Source selector circuit diagram

IV Experimental results

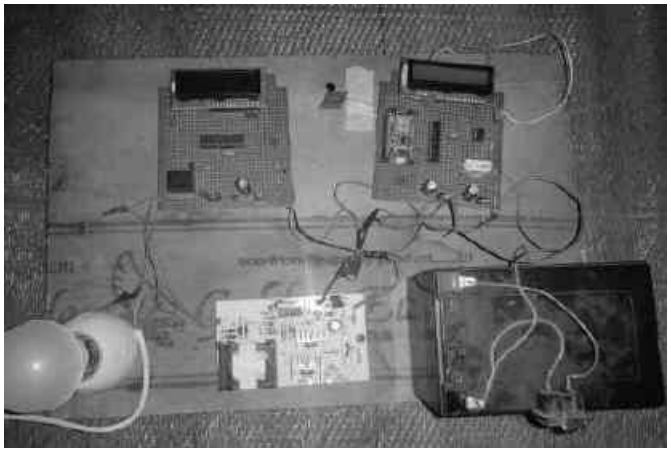


Fig.5 Experimental setup

Figure 5 shows experimental setup of proposed system.

Fig.6 Screen shot Blink App

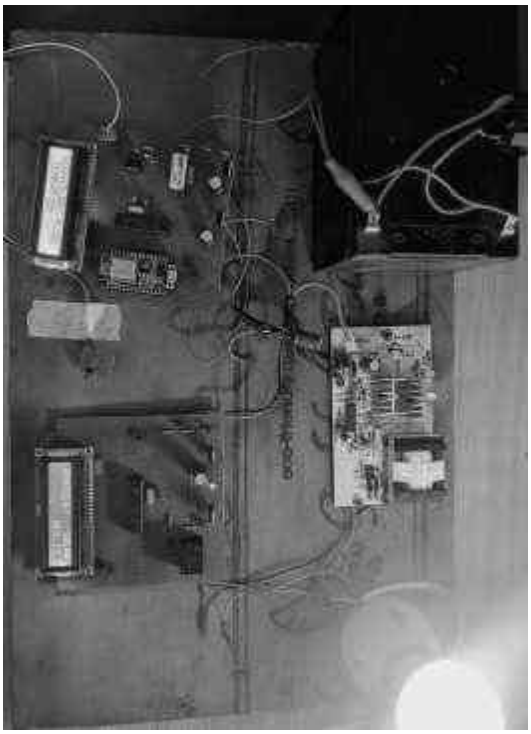


Fig 7. Running on Solar

Fig 7. Running on grid

This system runs on both solar as well as on grid as tested in figures 7 and 8 respectively

V Conclusion

This paper intended to design an auto power control of different sources circuit, the main scope of this project is to provide a continuous power supply to the load through any of the sources in the absence of any source. Taking in consideration the use of the source whose cost is the lowest then, the higher and so on. The first stage was to provide the four different sources, as it's not practicable to do so at the moment we connected two lines to a particular load which is a 220-V lamp line connected to a 5-V relay representing the two sources. The second stage was to control the circuit with the aid of ATMEGA328P microcontroller by burning a C language program into the ATMEGA328P. To sum up, the objectives which were stated in the first chapter were met successfully. The significance of this project lies in its various advantages and wide places of applications where this project can be used efficiently. Also we provided additional feature to this as Real Time battery parameter measuring and observe through.

References

[1] El-Ali, A., N. Moubayed, and R. Outbib. "Comparison between solar and wind energy in Lebanon." Electrical Power Quality and Utilisation, 2007. EPQU 2007. 9th International Conference.

[2] Gagari Deb and Arijit Bardhan Roy, International Journal of Computer and Electrical Engineering, No. February 2012

[3] Robert L. Boylestad and Louis Nashelsky Electronic devices and circuit theory Eight edition. Prentice Hall (Pearson Education Inc.) 2002 pp 875

[4] L.S. Ezema, B.U. Peter, O.O. Harris (2012), "Design of Automatic Change Over Switch with Generator Control Mechanism." Electrical Power and Electronic Development Department, Projects Development Institute (PRODA), Enugu: Natural and Applied Science, Vol.3, No.3. November, 2012. PP 125 – 130.

[5] Robert Dowuona-Owoo (2008), "Design and construction of three phase automatic transfer switch." A thesis presented at regent university college of science and technology Ghana. PP100-120

[6] Lionel Warnes. Electronic and Electrical Engineering. Principles and practice Macmillan Press Ltd. London

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:07/July-2022 Impact Factor- 6.752 www.irjmets.com

POWER GENERATION BY USING REVOLVING DOOR

N.S. Jadhav[*1], Abhishek Kupade[*2], Akshay Lad[*3]

[*1]Professor, Sanjeevan Engineering & Technology Institute, Panhala, Maharashtra, India.

[*2,3]Students, Sanjeevan Engineering & Technology Institute, Panhala, Maharashtra, India.

ABSTRACT

Humble world requires a ton of energy in various stages to run their occupation. So this handyman portrays the change of strong energy into mechanical energy which can be once more changed over into helpful electrical energy. The sustainable power and some unpredictable wellspring of energy likewise give revitalize economy to environment adjustment and lessen the utilization of petroleum derivative. The principal objective of this task is to plan and manufacture a smaller than expected rotating entryway which can create energy by intensifying the underlying RPM of entryway shaft that tackles human movement and transform it as power.

Keywords: Energy Generation, Dynamo, Gear, Pinion, Revolving Door.

I. INTRODUCTION

Energy is crucial for the advancement of a country and it must be rationed in a most capable way. Not just the advances ought to be created to deliver energy in nearly climate amicable way however we need to get from all assortments of energizes and furthermore most extreme ought to be given to ration the energy assets in the strict turn of events. most effective way. Energy is a definitive component liable for both modern and horticulture. The environmentally friendly power innovation to fulfill the energy needs have been consistently expanding for the beyond couple of years, notwithstanding, the significant downsides related with inexhaustible. Energy frameworks are their powerlessness to ensure dependability and their lean nature. In this day and age meeting implies for delivering energy by customary strategies are declining step by step. Entryway based power age unit is uniquely intended to plan and manufacture the change unit for using the accessible non-customary energy source. That is immensely accessible energy in low force with adequate amount can be used. This machine changes over responding movement in to revolving movement. The rotational power is put away in flywheel and flywheel pivot alternator that produce power. The men coming on the way apply the effect power or push on the projected instrument. This effect pressure energy can be used to work the rack and pinion outfitting and through the train of pulleys can work the fly wheel, which stores the energy and uses it for ceaseless pivot of the generator working pulley and belt transmission framework. This wellspring of force can be utilized at the shopping centers, universities or lodgings and doubtlessly by the emergency clinics entryway working frameworks. Additionally by aggregating this low force power in batteries, it tends to be provided to the large towns or in towns where shortage of electric stock. This creation connects with implies for using the excess energy which is consumed by people utilizing spinning entryways, gates and such, by making that overflow energy be applied to the age of force for work in valuable way. From perception in huge structures furnished with spinning entryways, as likewise at rail route stations, ship houses, entertainment meccas and different spots whose doorways are protected by gates, a lot of labor supply, in overabundance of that required, is imparted as motivations to these gadgets for their turn, and that a portion of this overflow force be placed into valuable impact. Hence the creation comprises of mounting a power wheel co-pivotally with connection to a rotating component, like a spinning entryway or gate and giving a pawl on said power wheel for commitment by said rotating component to impart to the power wheel, the motivations got by the rotating component in the manual activity of the last option. Energy subsequently conferred to the power wheel is to be communicated there from by reasonable means either for the age of power or in any case for work reason man has required and involved energy at a rising rate for his food and prosperity since he came on the earth a couple a long time back. Crude man required energy principally as food. He determined this by eating plants or creatures, which he chased. Consequently he found fire and his energy needs expanded as he began to utilize wood and other bio mass to supply the energy needs for cooking as well with respect to keeping himself warm. With the progression of time, man began to develop land for agribusiness. He added another aspect to the utilization of energy by taming and preparing creatures to work for him. With additional interest for energy, man started to involve the breeze for cruising ships and for driving windmills, and the power of

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:07/July-2022 Impact Factor- 6.752 www.irjmets.com

falling water to turn water for cruising ships and for driving windmills, and the power of falling water to turn water wheels. Till this time, it wouldn't be inappropriate to say that the sun was providing all the energy needs of man either straightforwardly or by implication and that man was utilizing just inexhaustible wellsprings of energy.

II. BLOCK DIAGRAM

The spinning entryway produces power by saddling energy that dispersed when human strolled through the entryway. At the point when any individual will push the door either course the power will be created through the generator joined with the stuff base system. As individuals utilize the entryway, the incorporated cog wheels associated with the focal pivot of entryway rotate. Because of the stuff proportion the turn given to the entryway has expanded multiple times, which is applied to the engine shaft. The power produced from the component will be put away in the battery-powered battery and it will be utilized for providing the power to the electrical machines that is the lights and numerous different apparatuses. A DC engine combined with the coordinated cog wheels produce power. All things considered the dc generator appended with the entryway clandestine the mechanical power into the electrical power. The stuff game plan is to be utilized with the generator to expand the rpm of generator so the most extreme measure of force we will have as a result. This created power is put away in the quantity of batteries.

A battery-powered battery is utilized to store the energy. Represents the stream graph of the framework. This is comprised of gentle steel, the total set up is fixed in this model of entryway system. The two L-shape outlines are fixed in the two finishes of the track. Roar this shapes open and shutting entryway and covered all sides by same gentle steel, the real power age course of action is built over the entryway. This L shape entryway window pushes the spike gear when the hour of train wheel continuing on these plan. There is a looming need to make significantly more invasions to make Non-Conventional energy achieve well known praise. This is additionally exceptionally vital for safeguard the ordinary wellsprings of energy and investigate feasible choices like practical energy (the energy which we are as of now using however for some security of different purposes we are unexpectedly squandering it, that can be reutilized), sun oriented, wind and biomass that can improve supportable development. Additionally, such options are climate agreeable and effectively recharge capable. In this way, they should be entirely taken advantage of with a practically convenient, energy framework blend. The specialist is continually adjusted to the difficulties of bringing thoughts and plan into the real world. New machines and methods are being grown constantly to make different items at less expensive rates and superior grade. Developing economies, particularly of Asia are gifted with adequate asset base and nonconventional energy advancements are reliable both for matrix connected energy age and transmission in far removed districts that are islanded from the network.

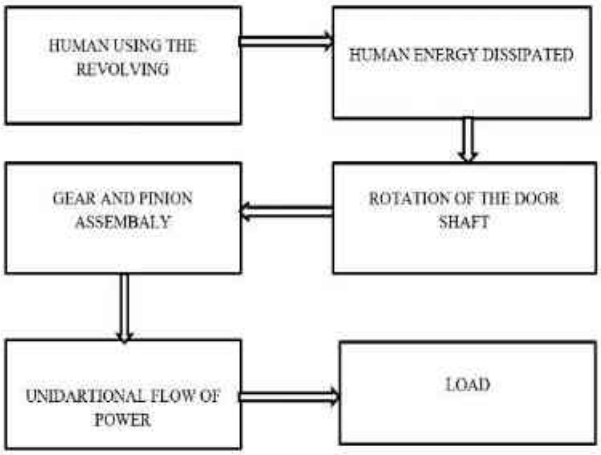


Figure 1: Block Diagram

III. IMPLEMENTATION

The innovation of the rotating entryway, even without an electromechanical generator, would be of benefit for any new structure as the consequence of reserve funds caused from brought down warming and cooling costs.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:07/July-2022 Impact Factor- 6.752 www.irjmets.com

The rotating entryway, with an electromechanical generator, the positive ecological effect is expanded, hence making this procedure an optimal trade for in any event a portion of the passageways in the new structures and stops. This innovation will enormously diminish the absolute Energy use at the structures and stops. At the point when individuals spin the entryway energy age increment because of the turn. This outcome on single day accepting the entryway is carried out in occupied with shopping centers, parks, clinics and many occupied royal residences. The rotating entryway produces power by saddling energy that scattered when human strolled through the entryway. At the point when any individual will push the entryway either heading the power will be created through the generator appended with the stuff base instrument. As individuals utilize the entryway, the coordinated pinion wheels associated with the focal hub of entryway rotate. Because of the stuff proportion the turn given to the entryway has expanded multiple times, which is applied to the engine shaft. The power produced from the component will be put away in the battery-powered battery and it will be utilized for providing the power to the electrical apparatuses that is the lights and numerous different machines. An alternator combined with the incorporated pinion wheels produce power. All things considered the alternator connected with the entryway secretive the mechanical power into the electrical power. The stuff plan is to be utilized with the generator to expand the rpm of generator so the greatest measure of force we will have as a result. This produced power is put away in the quantity of batteries.

The prime units are Alternator, Chain Sprocket, Chain Drive, Bearing blocks The specifications and motive of some major components used in the project are presented in Table 1.

Table 1: Properties Of Major Components

Name	Purpose and Rating
Alternator	60RPM,
Chain Sprocket	We used chain Sprocket of bicycle.
Chain drive	For drive the alternator
Bearing blocks	For smooth operation we use bearing

IV. OBJECTIVES AND SCOPE

The fundamental goals of the review are illustrated beneath:

- To develop a more reasonable spinning entryway instead of business made generator.
- To acquire greatest energy and use it appropriately
- To make social mindfulness among society about efficient power energy
- To make the mindfulness among people groups about non-sustainable sources.
- To decrease the utilization of non-inexhaustible sources
- To concentrate on the energy age by utilizing spinning entryway..
- No impact on moving individuals.
- Upkeep is irrelevant, just grease is expected for the cog wheels.
- Greater power can be created by the legitimate planning of generator and capacity limit of battery.
- Free energy which is changed over by no additional work.

A. Alternator

An alternator is an electrical generator that switches mechanical energy over completely to electrical energy through substituting flow. Because of reasons of cost and effortlessness, mostalternators utilize a pivoting attractive field with a fixed armature. Incidentally, a straight alternator or a turning armature with a fixed attractive field is utilized. On a basic level, any AC electrical generator can be called an alternator, however normally the term alludes to little pivoting machines driven via car and other gas powered motors. An alternator that includes an enduring magnet for its alluring field is known as a magneto. Alternators in power stations driven by steam turbines are called super alternators. Alternators in power stations driven by steam turbines are called super alternators. Huge 50 or 60 Hz three-work alternators in power plants create the greater part of the world's electric power, which is disseminated by electric power frameworks The alternator

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:07/July-2022 Impact Factor- 6.752 www.irjmets.com

has a controller that attempts to keep the voltage across the battery at a consistent 6V (the ideal voltage to re-energize 6V vehicle batteries)..

Figure 2: Alternator

B. Chain Sprocket

Chain drive is an approach to sending mechanical power starting with one spot then onto the next. " is irritate used to pass power on to the wheels of a vehicle, especially bikes and cruisers. Most frequently, the power is conveyed by a Roller chain, known as the drive chain or transmission chain, disregarding a sprocket gear, with the teeth of the stuff fitting with use openings in the connections of the chain, The stuff is turned, and this pulls the chain placing by apical power into the framework.

Figure 3: Chain Sprocket

C. Chain Drive

Chain drive is an approach to communicating mechanical power starting with one spot then onto the next. It is frequently used to pass power on to the wheels of a vehicle, especially bikes and cruisers. It is likewise utilized in a wide assortment of machines other than vehicles. Most frequently, the power is conveyed by a roller chain, known as the drive chain or transmission chain disregarding a sprocket gear, with the teeth of the stuff fitting with the openings in the connections of the chain. The stuff is turned, and this pulls the chain placing mechanical power into the framework. One more kind of drive chain is the Morse chain, designed by the Morse Chain Company of Ithaca, New York, United States. This has reversed teeth.

D. Bearing Blocks

Cushion blocks are typically alluded to the lodgings which have a heading fitted into them and hence the client need not buy the direction independently. Cushion blocks are typically mounted in cleaner conditions and by and large are intended for lesser heaps of general industry. These contrast from "Plummer blocks" which are bearing lodgings provided with next to no course and are typically implied for higher burden evaluations and destructive modern conditions. Anyway the terms cushion block and Plummer-block are utilized conversely in specific regions of the planet. The basic use of the two sorts is a similar which is to principally mount direction securely empowering their external ring to be fixed while permitting turn of the inward ring. The lodging is dashed to an establishment through the openings in the base. Bearing lodgings are uier parted type or un split type. Part type lodgings are generally two piece lodgings where ie cấp and base can be separated, while specific series are one single piece lodgings. Devout seals are given to keep dust and different impurities from entering the noosing. Consequently the lodging gives a perfect climate to the costly heading to ay pivot, thus expanding their exhibition and obligation cycle. Bearing lodgings are generally made of dim solid metal.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:07/July-2022 Impact Factor- 6.752 www.irjmets.com

Figure 4: Bearing Block

E. Complete Revolving Door Project

Figure 5: Complete Revolving Door Project

V. RESULTS

As energy is a significant element to support modern development and way of life of a nation and is interesting to the per-capita energy utilization. The traditional energy sources are lessening enthusiastically and in neighboring coming period the world should rely upon non-customary hotspots for age of force. Different sorts of non-customary sources are accessible like sun powered energy, wind energy, biogas and so forth. In this strategy the energy is reaped from human without affecting environment and convert electrical energy with the assistance of shaft. This shaft is associated with the electric dynamo and it produces electrical energy corresponding to people, more will individuals more will be the energy created.

The testing of model is finished based on revolutions and normal season of individual to go into any structure or where it is laid out to spin entryway. The review shows that power got from this model is at first exceptionally low yet it very well may be reach generally by making the entryway plan legitimate and utilizing the productive devices.In our model, an essential idea or propensity for any individual to open the entryway is thought about. At the point when an individual pushes an entryway, it will open by 90 degrees or minimal more. For a 90 degree upheaval, we are getting a typical result of 0.94V and 0.06A, so at last the power yield is 0.06 watt. Assuming we thought about that Second individual will push the entryway after 5 sec then in 1 moment, 12 individuals will push the entryway and they will create 0.72 watt in one minute.As 1 min. is relates to 0.72 watt then in 1 hr. (60 min.), the entryway needs to foster 43.2 watt. The power acquiring is simply based on what model creating at normal degree of execution. The establishment of this model is conceivable just where there is swarm is acquired, for example, shopping centers, air terminals, rail route stations, banks or some other public places.At greatest upheaval of entryway, it gives 5.3 watt at 30 RPM which are gotten based on computations of 1 transformation for every sec. which creates normal of 0.3V.

VI. CONCLUSION

The need of planning and assembling such a framework, which will make the Door activity to some degree adaptable, likewise the energy being consumed by the age framework will be used to change over it in to power.

We came to realize that how the genuine power can be created with the assistance of working of the dynamo utilized in project. We had the option to comprehend the essential ideas of the parts as well as we had gotten through the standard plan techniques that we had continued in project.

We need to comprehend and encounter the assembling and creation accomplished for the model. Additionally we had the programmed entryway activity that is shutting and opening of the entryway. Simultaneously decreased the expense of sensors utilized needing planning and assembling such a framework, which will make the Door activity to some degree adaptable, likewise the energy being consumed by the age framework will be used to change over it in to power. We need to concentrate on the energy which is going waste either way can be used to create power utilizing basic instrument.

As the present world is totally subject to various kinds of energies and these energies will vanish or debilitate either day so we want to involve free energy to run our fundamental machines which require power for its working.

From the trial and error of this model, we can make end that this model can produce low force power which is adequate to ease up the little region. As the greater part of the nations neglects to give adequate power to their individual towns those towns actually confronting power cutting issues, so this little drive will assist with settling their concern at great level. This model is competent to produce 2 volts at 30 RPM saw at least degree of execution. By expanding the boundaries and making the legitimate plan, this model can produce adequate power, in the event that it is introduced where more individuals development happened.

VII. REFERENCES

[1] Rai. G.D. “Non-conventional Energy Sources”, Khanna Publishers, International Journal of Engineering Trends and Technology (IJETT) – Vol-2, 2011, Pp 245-252

[2] Ramesh. R, Udayakumar, K Ananda Krishnan “Renewable Energy Technologies”, Narosa Publisher, International Journal of Renewable Energy, vol-1, 2001, Pp 58-65

[3] Luciano Vasija, (May 22, 2001), Method of Generating Electricity, US-6236118.

[4] Bisoyi B, Das B. Adapting Green Technology for Optimal Deployment of Renewable Energy Resources and to Generate Power for Future Sustainability. Indian Journal of Science and Technology. 2015; 8(28).

[5] Jacobson MZ, Delucchi MA. A path to sustainable energy by 2030. Scientific American. 2009; 301(5):58–65.

[6] Jacobson MZ, Delucchi MA. Providing all global energy with wind, water, and solar power. Part I: Technologies, energy resources, quantities and areas of infrastructure, and materials. Energy Policy. 2011; 39(3):1154–69.

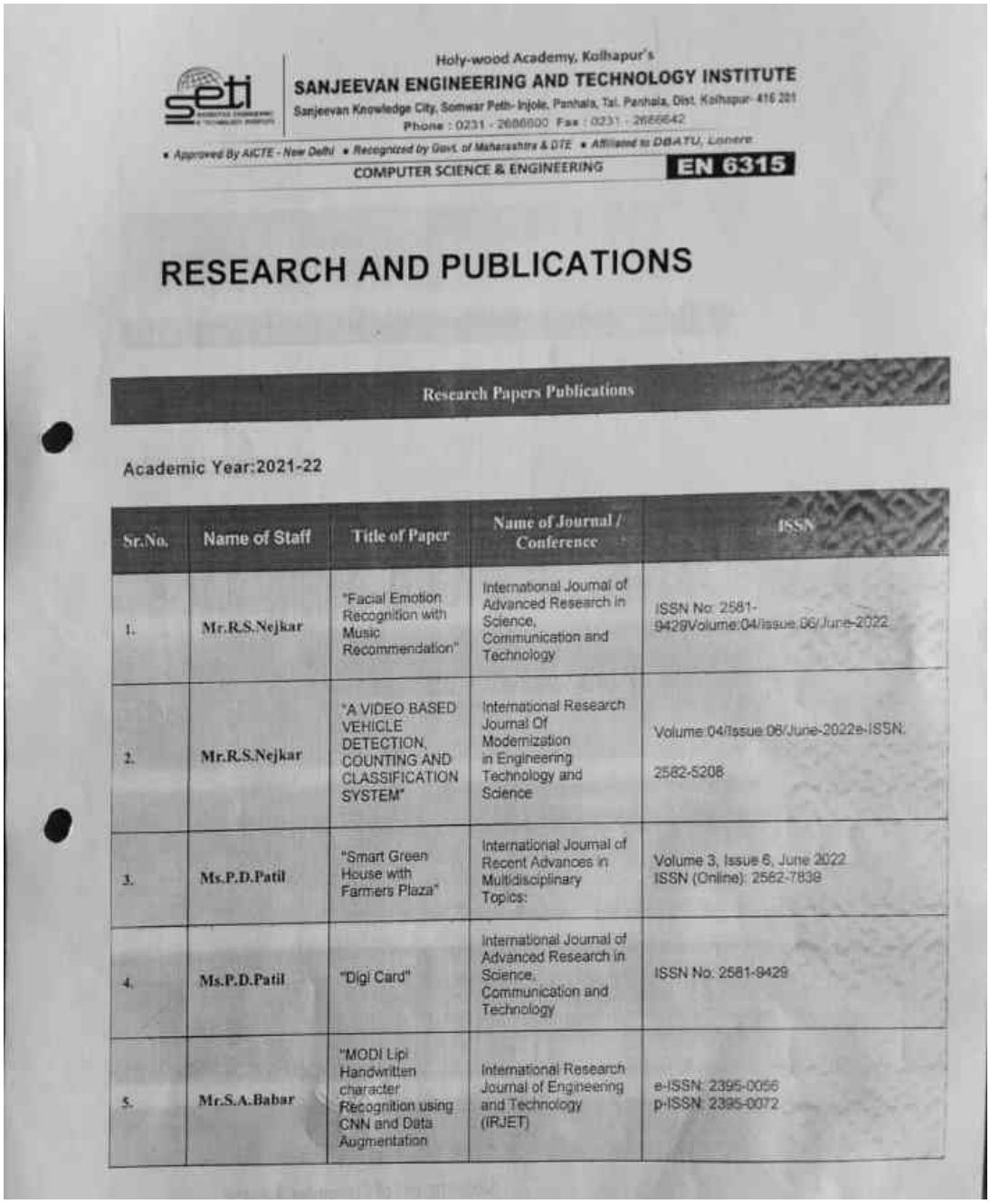
[7] Darle W. Dudly; Hand Book Of “ Practical Gear Design”

[8] www.electricalIndia.in

[9] Fridleifsson IB. Status of geothermal energy amongst the world’s energy sources. Geothermics. 2003; 32(4):379–88.

Criteria 3 : CSE Dept.2021-22

3.2.1 (Qnm)	papers published per teacher in the Journals: Papers first page / certificate



Holy-wood Academy, Kolhapur's
SANJEEVAN ENGINEERING AND TECHNOLOGY INSTITUTE
Sanjeevan Knowledge City, Somwar Peth- Injole, Panhala, Tal. Panhala, Dist. Kolhapur- 416 201
Phone : 0231 - 2686600 Fax : 0231 - 2686642
▪ Approved By AICTE - New Delhi ▪ Recognized by Govt. of Maharashtra & DTE ▪ Affiliated to DBATU, Lonere
COMPUTER SCIENCE & ENGINEERING EN 6315

RESEARCH AND PUBLICATIONS

Research Papers Publications

Academic Year:2021-22

Sr.No.	Name of Staff	Title of Paper	Name of Journal / Conference	ISSN
1.	Mr.R.S.Nejkar	"Facial Emotion Recognition with Music Recommendation"	International Journal of Advanced Research in Science, Communication and Technology	ISSN No: 2581-9429Volume:04/Issue:06/June-2022
2.	Mr.R.S.Nejkar	"A VIDEO BASED VEHICLE DETECTION, COUNTING AND CLASSIFICATION SYSTEM"	International Research Journal Of Modernization in Engineering Technology and Science	Volume:04/Issue:06/June-2022e-ISSN: 2582-5208
3.	Ms.P.D.Patil	"Smart Green House with Farmers Plaza"	International Journal of Recent Advances in Multidisciplinary Topics:	Volume 3, Issue 6, June 2022 ISSN (Online): 2582-7838
4.	Ms.P.D.Patil	"Digi Card"	International Journal of Advanced Research in Science, Communication and Technology	ISSN No: 2581-9429
5.	Mr.S.A.Babar	"MODI Lipi Handwritten character Recognition using CNN and Data Augmentation	International Research Journal of Engineering and Technology (IRJET)	e-ISSN: 2395-0056 p-ISSN: 2395-0072

		Techniques"		
6.	Mr.S.A.Babar	"The Analysis of Share Market using Random Forest & SVM"	International Research Journal of Engineering and Technology (IRJET)	e-ISSN: 2395-0056 Volume: 09 Issue: 04 | Apr 2022 p-ISSN: 2395-0072
7.	Mr.S.A.Babar	"Video Trasnscript Summarization in Marathi"	International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)	ISSN(Online)2581-9429,Volume 2, Issue 6 June 2022
8.	Mr.V.A.Shevade	"E-Health Care Cloud Solution"	International Research Journal of Engineering and Technology (IRJET)	e-ISSN: 2395-0056 p-ISSN: 2395-0072
9.	Mr.V.A.Shevade	"BLOCK CHAIN BASED SECURE DATA STORAGE ON CLOUD"	International Research Journal Of Modernization In Engineering Technology And Science (IRJMETS)	e-ISSN: 2582-5208,Volume:4, Issue:07, July 2022
10.	Mrs.T.V.Deokar	"A survey on Enhancements in Speech Recognition"	International Research Journal of Engineering and Technology (IRJET)	e-ISSN: 2395-0056 p-ISSN: 2395-0072Volume: 09 Issue: 06 | Jun 2022
11.	Mrs.T.V.Deokar	E-Commerce Website "City Kart"	International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)	ISSN (Online) 2581-9429,Volume 2, Issue 9, June 2022
12.	Ms.S.S.Kumbhar	Traffic Analysis using Image Processing to Alert Traffic Control	International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)	Volume 2, Issue 9, June 2022,ISSN (Online) 2581-9429
13.	Ms.S.S.Kumbhar	"THE VIRTUAL DRESSING ROOM"	International Research Journal of Modernization in Engineering Technology and Science	e-ISSN: 2582-5208,Volume:04/Issue:06/June-2022

H.O.D.(CSE)

HOD
Department of Computer Science
& Engineering
Sanjeevan Engg. & Tech. Institute
Somwar Peth, Panhala - 416 201

Papers first page :

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 5, June 2022
Impact Factor: 6.252

Facial Emotion Recognition with Music Recommendation

Muskan Jamadar[1], Sakshi Jadhav[2], Rutuja Dame[3], Mayuri Patil[4], Sujata Patil[5], Prof. R. S. Nejkar[6]
Students, Department of Computer Science and Engineering[1,2,3,4]
Assistant Professor, Department of Computer Science and Engineering[5]
Sanjeevan Engineering and Technology Institute, Panhala, Maharashtra, India

Abstract: *Facial emotion recognition is advancement in computer vision and machine literacy and with the help of this computing technology it's easy to identify mortal emotion through images also. In this paper we propose fashion call facial emotion recognition with music recommendation using Convolutional Neural Network (CNN). The FER is grounded on three corridor. The first part removes the background from the picture, the alternate part concentrates and maps the facial point vector birth, and the third part recommends music grounded on prognosticated emotion. So, to train the images online database is taken from the Kaggle and consequently the feelings are labelled with 96 of delicacy. Further, grounded on emotion vaticination music or audio song will be recommended from the database.*

Keywords: Facial Emotion Recognition

I. INTRODUCTION

Facial Emotion Recognition is grounded on Deep literacy. Deep literacy is a branch of Machine literacy which is fully grounded on Artificial Neural Network as neural network is going to mimic the mortal brain. One of the main corridors of Neural Network is Convolutional Neural Network (CNN) which comes under deep literacy. CNN are made up of neurons. A CNN is neural network that has one or further convolutional layers and are used substantially for image processing, bracket, segmentation and also other bus identified data. The main advantage of CNN is that it automatically detects the important features without any mortal supervision. This is why CNN would be an ideal result to computer vision and image bracket problems. The facial emotion recognition is a process of detecting mortal feelings and facial expressions. We concentrate on five essential facial expressions which are wrathfulness, sad, happy, stressed, and surprised. This design aims for expressional examination and to characterize the given image into these five essential feelings. Haarcascade Algorithm is substantially used to identify Mortal face and helps in background junking of a input image. After junking of background only face vector is taken into consideration. Grounded on the vaticination of emotion through face vector music will be recommended from database.

1.1 Convolutional Neural Network (CNN)

Convolutional Natural Network is a Deep literacy algorithm which can take in an input image assign significance (learnable weights and impulses) to colorful aspects/ objects in the image and be suitable to separate one from the other. A CNN is a type of artificial neural network used in image recognition and processing, that's especially designed to reuse pixel data. Images contain data of RGB combination. The computer does not see an image, all it sees is an array of figures. Color images are stored in 3 - dimensional array. The first two confines correspond to the height and range of the image (the number of pixels) The last dimension corresponds to the red, green and blue colors present in each pixel. Three layers of CNN: There are three types of layers in CNN

1. Convolutional Layer: Convolutional Layer a typical neural network each input neuron is connected to the coming retired subcaste. In CNN only a small region of the input subcaste neurons connects to the neuron hidden subcaste
2. Pooling Layer: Pooling Subcaste The pooling subcaste is used to reduce the dimensionality of the point chart. There will be multiple activation and pooling Players inside the retired subcaste of the CNN.
3. Fully - Connected layer: form the last many layers in the network. The input to the completely connected

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

A VIDEO BASED VEHICLE DETECTION, COUNTING AND CLASSIFICATION SYSTEM

Mahesh Suryawanshi*1, Akash Ghadage*2, Shubham Ingwale*3, Prathamesh Sutar*4, Shubham Mudshingkar*5, Prof. R.S. Nejkar*6

*1,2,3,4,5Students, Department Of Computer Science & Engineering, Sanjeevan Engineering And Technology Institute Panhala, Maharashtra, India.

*6Assistant Professor, Department Of Computer Science & Engineering, Sanjeevan Engineering And Technology Institute Panhala, Maharashtra, India.

ABSTRACT

Traffic monitoring on road needs to be done, the counting of the number of vehicles passing the road is necessary. It is more emphasized for highway transportation management in order to prevent efforts. Therefore, it is necessary to develop a system that is able to counting the number of vehicles automatically. Video processing method is able to counting the number of vehicles automatically. This system includes processes of video acquisition, frame extraction, and image processing for each frame. This project has a system of vehicle counting on wide road. This system employs of background subtraction and morphology methods on gray scale images for vehicle counting. This presents a developed system which achieves vehicle detection by using background image subtraction algorithm.

Keywords: Vehicle Dataset, Image Segmentation, Vehicle Detection, Vehicle Counting.

I. INTRODUCTION

The increasing number of vehicles makes a lot of pressure on roads capacity and infrastructure. Accordingly, the traffic management is too difficult and the traffic hazards increases at a high rate, moreover it causes a huge loss of life and property due to the road accidents. Vehicle detection systems play an important role to reduce the harmful side effects of traffic, as a part of many traffic applications such as road traffic control, traffic response system, traffic signal controller, lane departure warning system, automatic vehicle accident detection and automatic traffic density estimation. Image processing methods are able to process video files to detect moving objects. The field of image processing, especially the method of object tracking is already widely used to detect and classify all sorts of moving objects. The advantages of this system are to calculate the number of vehicles automatically by using a camera device. With this system will get data in real time and can be done for monitoring the density of traffic. Moving vehicles detection is usually carried out by using background image subtraction techniques. The key behind this kind of techniques is to first build a background model from a sequence of images in order to find the moving vehicles from the difference between that background estimation and the current frame. The weakness of this system is its accuracy is very dependent on the illumination, with good illumination this system will have a very good accuracy. However, if the illumination is not good, as at night, the accuracy of this system will decrease significantly.

II. RELATED WORK

Various approaches were made to develop such systems that can detect, count and classify the vehicles and can be used for traffic surveillance in intelligent transportation systems. This section covers the discussion about such systems and the knowledge about the methods used to develop such systems. Tursun, M and Amrulla, G [4] proposed a video based real-time vehicle counting system using optimized virtual loop method. They used real time traffic surveillance cameras deployed over roads and compute how many vehicles pass the road. In this system counting is completed in three steps by tracking vehicle movements within a tracking zone called virtual loop. Another video-based vehicle counting system was proposed by Lei, M., et al. [5]. In this system surveillance cameras were used and mounted at relatively high place to acquire the traffic video stream, the Adaptive background estimation and the Gaussian shadow elimination are the two main methods s that were used in this system. The accuracy rate of the system depends on the visual angle and ability to remove shadows and ghost effects. The system's incompetency to classify vehicle type is the core limitation of the system. Bas et

International Journal of Recent Advances in Multidisciplinary Topics
Volume 3, Issue 6, June 2022
https://www.ijramt.com | ISSN (Online): 2582-7839

Smart Green House with Farmers Plaza

Mukta Sanjay Gurav[1*], Pallavi Kiran Patil[2], Swapnaja Anil Shintre[3], Sadhana Shankar Telvekar[4], Rutuja Shivaji Yadav[5], P. D. Patil[6]

[1,2,3,4,5]Student, Department of Computer Science and Engineering, Sanjeevan Engineering and Technology Institute, Panhala, India
[6]Assistant Professor, Department of Computer Science and Engineering, Sanjeevan Engineering and Technology Institute, Panhala, India

Abstract: Issues concerning agriculture's production, promotion, and manipulation usually limit farmers' development. The handiest solution for all of the above issues is agricultural modernization and a farmer's plaza. The creation of a web portal and android app using cloud computing, and the Internet of Things in agriculture, and for promoting the products. This internet site will lessen the farmer's paintings of dealing with the farm and promoting the farming products. We keep all of the data that will be collected from sensors in the cloud and manage that data with addition to plaza into the cloud. It is designed as an internet site that lets for Gathering facts, dealing with all of the facts, and tracking in addition to promoting the farming products.

***Keywords*: Web application, Cloud computing, Internet of Things, Smart agriculture.**

1. Introduction

Farmers Plaza is a web page and android app that is used for promoting farming merchandise that comprises vegetables, flowers, wheat, etc. It is a cloud-primarily based simply an internet utility that gives an easy and smooth manner simply so clients and farmers can talk outcomes and now no longer the use of a center man or woman or a vender. Due to those farmers and clients get preserves of greater benefits. India is an everyday agricultural USA with the productiveness of rice, sugarcane, groundnuts, vegetables, flowers, etc. Agriculture, rural area, and farmers are of precise significance in terms of socialist modernization reform.

This project works as a mediator between farmers and consumers to offer a green manner for promoting and shopping for the goods and managing the farm. In this project, recognized agencies and researchers can post their new studies and government policies which are associated with the farm which may be useful for farmers. The corporations provide some hyperlinks and authority recommendations for the farmer.

2. Literature Review

Liu Dan, Cao Xin, Huang Chongwei, Ji Liangliang - "Intelligent Agriculture Greenhouse Environment Monitoring System Based on IOT Technology" by using this paper we got how the data was collected by the circuit and sent to the database. Then how the processed data is sent to intermediate after that to PC or mobile through the serial port.

Richard K. Lomotey, Yiding Chai, Shomoyita Jamal, and Ralph Deters - "MobiCrop: Supporting Crop Farmers with a Cloud-Enabled Mobile App" by using this reference we got that to enable farmers to have mobile access to up-to-date information on pesticides and further make decisions on which pesticides to apply, how to apply them when to apply them, and so on. Due to its complexity, MobiCrop is designed as a mobile distributed system that follows a three-layered deployment; comprising mobile nodes, a cloud-hosted middleware, and a cloud-hosted database server.

Manish Wagale, Kousuhh Nilje, Pooja Wadkar - "A cloud-enabled mobile and web-based application for the farmer" by using this reference we got how we can sell the farming products to customers in an efficient way without any third person or vendor.

Amjad Alsirhani, Peter Bodorik, Srinivas Sampalli - "Improving Database Security in Cloud Computing by Fragmentation of Data" by using this reference we got how we can secure our database using an Encryption Algorithm. AES 256 is the decryption algorithm that we can use for the decryption of data in the database.

Fan TongKe - "Smart agriculture based on cloud computing and IoT"- by using this reference we got how to manage the farm inefficient way to increase productivity. Also, as to how to manage all data gathered by the sensors, monitor the data, and display the desired output.

3. Proposed Work

A *Problem Definition*

The reason for choosing this topic is that due to the current Corona pandemic farmers are not able to sell their products like vegetables, flowers, wheat, etc. directly to customers. They sell their products through third-party vendors. Mediator analyzes the product and decides the rate as they want to get more benefits for their business. Now they tell one rate to the farmer and sell that product to the shopkeeper or customer at a different rate because he wants more benefits. Another scenario is that farmers can't available 24/7 on the farm to check the temperature, humidity, and water needed to farm or not. By using the Internet of Things, we can efficiently manage all things with just a few clicks. Due to that, farmers can do other work as they want.

*Corresponding author: muktag1708@gmail.com

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 5, June 2022
Impact Factor: 6.252

Digi Card

Samruddhi Kamate[1], Prajakta Kurade[2], Swapnali Mahajan[3], Shubhangi Mankar[4], Divya Waghmare[5], Prof. P. D. Patil[6]
Students, Department of Computer Science & Engineering[1,2,3,4,5]
Assistant Professor, Department of Computer Science & Engineering[6]
Sanjeevan Engineering and Technology Institute, Panhala, Maharashtra, India

Abstract: *Most of the paper business or visiting cards have main problem of business advertising is said with share contact, location, product pictures, prices, etc. When Businessman wants to share his own identity card that point he should use a tough copy of salutation. And it's going to be scratch, explosion, forgotten and also end in an outsized amount of paper waste produced annually. This many issues overcome during this project. In, this journal we are visiting develop Digital identity card to take care of the profile up to now within the personal and professional life. A digital identity card (also referred to as virtual business cards, electronic business cards, and digital visiting cards) is a web means of sharing contact information. You'll create a digital identity card on an iPhone, iPad, Android, or computer, and they are often cheaper than their paper counterparts. It permits you to automatically update the changes in your contact information, addresses, and contrariwise, easy accessibility.*

Keywords: Digital visiting card, Android App, Website, Cloud Storage.

I. INTRODUCTION

Digicard is a website and android application for creating a Business cards and Exchange of business cards. The aim of digital card is straightforward to assist you connect with more potential client partners, and co-worker. The Program Offers user a Template to make business cards and method to exchange business cards. User can use the system to book Meeting or appointments with their contacts. Digital cards are a brand-new way of sharing your contact information and important content helping you grow your professional network and business. In today's digital world everyone wants to be found online by creating their online identity through online platform. It helps us to share how you're and what your business is all about. You'll be able to send your card to anyone whether or not they are doing not have the app installed on their smartphone. A digital card last you automatically update the changes in your contact information, addresses, vice versa. Going digital is healthier for both networking and therefore the environment. Virtual cards are always available once you need them and never run out.

II. PROBLEM DEFINITION

In today's digital world everyone wants to be found online by creating their online identity and other people Cards does it for you. Paper Card are how of sharing your contact information and important content helping you grow your professional network and business. This can be unimaginable covid time to share paper card . One of the most important problem with using the printed identity card is that the production of a large amount of paper waste. Even within the digital world which is flooded with Smartphones, Personal computers, laptops and tablets peoples are still practicing the utilization of text identity card.

III. OBJECTIVE

One of the most important problem with using the printed card is that the production of an enormous amount of paper waste.
Even within the digital world which is flooded with smartphones, Personal computers, laptop and folks is still practicing the employment of text card.
It is such a waste and that we must try our effect to prevent it.

International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 06 | Jun 2022 www.irjet.net p-ISSN: 2395-0072

MODI Lipi Handwritten character Recognition using CNN and Data Augmentation Techniques

Vishal Pawar[1], Deepak Wadkar[2], Shivkumar Kashid[3], Premraj Prakare[4], Vinayak More[5], Prof. S.A. Babar[6]

[1,2,3,4,5]Students, Department of Computer Science & Engineering, Sanjeevan Engineering and Technology Institute Panhala (Maharashtra, India).
[6]Assistant Professor, Department of Computer Science & Engineering, Sanjeevan Engineering and Technology Institute Panhala (Maharashtra, India).

Abstract - *MODI is an old Indian script from Maharashtra. This script was popular for drafting official papers during the reign of Chhatrapati Shivaji Maharaj. Character recognition MODI is difficult due to its structural features and the lack of an image database. In this research, we created a CNN model for character recognition and used data augmentation techniques to expand the MODI script's dataset. Because the MODI script includes a limited image dataset of 4140 images, we applied data augmentation to the dataset and trained the CNN model on a produced dataset. The trained model recognizes Handwritten MODI characters with an accuracy of about 91.62%.*

Key Words: **Convolutional Neural Network, Data Augmentation, Deep Learning, Image Processing, Character Recognition.**

1. INTRODUCTION

MODI is a Brahmi-based script that is mostly used for writing Marathi. MODI Script was commonly used until 1950 when everyone switched to the Devanagari script. The MODI script was used to write official documents, cultural literature, and religious books. As a result, most old writings from the 12th century to the 19th century in Maharashtra State, India, are written in MODI Script. However, most individuals are unaware of the script. The study in this paper focused on handwritten character identification and transliteration to Marathi script.

The MODI script dates back to the 12th century and was used until the 20th century. Shivkalin and the Peshava Kalin Kingdom have both used MODI Script. Figure 1 depicts a letter written in MODI Script by Chh. Shivaji Maharaj.

As time passed, various changes were made to the forms of writing of MODI. In the 12th century, MODI Script was called "Adyakalin", and in the 13th century, it evolved as a new script known as "Yadavkalin". The "Bahamanikalin" of the 14th-16th centuries is the next phase of development, followed by the "Shivakalin" of the 17th century. MODI's ultimate stage is related to English rule and is known as "Angiakalin". From 1818 to 1952, this style of writing was in use. MODI was also used in elementary school textbooks published in the nineteenth and twentieth century. Then Devanagari Script began to replace MODI Script in the twentieth century. The Bombay Presidency decided on July 25, 1917, to replace the MODI script with the Balbodh style of Devanagari as the primary administration script for ease and consistency with the other areas of the presidency [1].

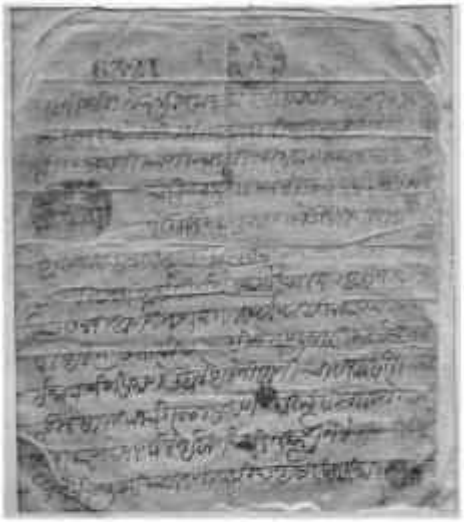


Fig-1: Letter Written by Chh. Shivaji Maharaj

2. IMPORTANCE OF MODI SCRIPT

Thousands of Modi documents have been saved in South Asia and Europe. Due to the presence of these Europeans in Tanjore, Pondicherry, and other South Asian places throughout the nineteenth century, the majority of these are stored in various archives in Maharashtra, although lesser collections are kept in Denmark and other nations. The earliest surviving Modi document is from the early 17th

International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 05 | May 2022 www.irjet.net p-ISSN: 2395-0072

The Analysis of Share Market using Random Forest & SVM

Ajay Patil[1], Vivek Patil[2], Pranav Sawant[3] Dipak Kadam[4], Sandesh Patil[5], Prof S.A. Babar[6]

[1,2,3,4,5] *Students, Department of Computer Science & Engineering, Sanjeevan Engineering and Technology Institute Panhala (Maharashtra, India).*

[6] *Assistant Professor, Department of Computer Science & Engineering, Sanjeevan Engineering and Technology Institute Panhala (Maharashtra, India)*

Abstract - *The main purpose of this journal is to find the most accurate model to forecast the value of the share market. During the procedure of considering various approach and variables that must be taken into account, we found out that methodology like random forest and support vector machine were not utilized fully. In, this journal we are going to develop and analysis a more efficient technique to forecast the stock movement with perfection. We have taken the stock market values from last five days from the yahoo finance which is an authenticating source of information. The dataset is stored in the CSV file which is already pre-processed and we will use it for prediction. Therefore, our journal will be focusing on the techniques. After the storing data we are going to apply random forest algorithm and support vector machine algorithm to bring precise output. In addition, the proposed paper examines the utilization of the forecast system in real-world settings and issues related with the precise output of the overall values given. This paper is going to represent an extraordinary machine learning model. The victorious forecast of share will be benefit to the all-stock market organization and will supply real-world answer to all the issues that shareholder face.*

Key Words: **Machine Learning, Forecast, Dataset, Stock, Share Market, Random forest, SVM.**

1. INTRODUCTION

The stock market is a place where shares of public listed companies are traded. A share (also known as equity) is a security that represents the ownership of fraction of corporation or company. The act of trying to determine the future value of a company stock or other financial instrument traded on an exchange is called as stock market prediction. The model will be powerful, exact and proficient. The framework should work as per the genuine situations and ought to be appropriate to certifiable settings. The framework is additionally expected to consider every one of the factors that could influence the stock's worth and execution. There are different strategies and approaches to executing the forecast framework like Fundamental Analysis, Technical Analysis, Machine Learning, Market Mimicry, and Time series angle organizing. With the progression of the computerized period, the expectation has climbed into the mechanical domain. The most unmistakable and promising strategy includes the utilization of Artificial Neural Networks, Recurrent Neural Networks, that is essentially the execution of AI. AI includes man-made reasoning which engages the framework to gain and improve from previous encounters without being customized on numerous occasions. Customary techniques for expectation in AI use calculations like Backward Propagation, otherwise called Backpropagation blunders. Of late, numerous scientists are utilizing a greater amount of outfit learning procedures. It would utilize low cost and delays to foresee future highs while another organization would utilize slacked highs to anticipate future highs. These forecasts were utilized to shape stock costs. Securities exchange cost expectation for brief timeframe windows gives off an impression of being an irregular cycle. The stock cost development throughout a significant stretch of time typically fosters a straight bend. Individuals will quite often purchase those stocks whose costs are supposed to ascend soon. The vulnerability in the securities exchange forgo individuals putting resources into stocks. Consequently, there is a need to precisely foresee the financial exchange which can be utilized in a genuine situation. The techniques used to foresee the financial exchange incorporates a period series estimating alongside specialized investigation, AI displaying and anticipating the variable securities exchange. The datasets of the securities exchange forecast model incorporate subtleties like the end cost opening value, the information and different factors that are expected to foresee the item factor which is the cost in a given day. The past model utilized conventional strategies for expectation like multivariate examination with a forecast time series model. Securities exchange forecast outflanks when it is treated as a relapse issue however performs well when treated as a grouping. The point is to plan a model that increases from the market data using AI methodologies and check what's in store designs in stock worth turn of events. The Support Vector Machine (SVM) can be utilized for both grouping and relapse. It has been seen that SVMs are more utilized in arrangement-based issue like our own. The SVM procedure, we plot each and every information part as a point in n-layered space (where n is the quantity of elements of the dataset accessible) with the worth of component being the worth of a specific direction and, thus characterization is performed by finding the hyperplane that separates the two classes unequivocally. Prescient strategies like Random woods method are utilized for something very similar. The arbitrary timberland calculation follows an outfit learning system for grouping and relapse. The irregular woodland

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 6, June 2022
Impact Factor: 6.252

Video Transcript Summarization in Marathi

Shivani Patil[1], Swati Yadav[2], Shreya Shinde[3], Darshani Waghmare[4], Rutuja Patil[5], Prof. S. A. Babar[6]
Students, Department of Computer Science & Engineering[1,2,3,4,5]
Assistant Professor, Department of Computer Science & Engineering[6]
Sanjeevan Engineering and Technology Institute Panhala, Maharashtra, India

Abstract: *This paper's purpose is a summarization of the video in Regional Languages. During the procedure, we used methodology NLP, LSA, and MoviePy. This paper aims to produce a Short video of long video without missing any point. The technique first short video of any downloaded video. A web application that takes an input of the video and accuracy of the video, then we get this summaries video into text and this text converted into any Regional language. This paper is going to represent an Extraordinary NLP application. This application benefits Students, and teachers by saving time.*

Keywords: LSA, POS Tagging, Text Recognition, Frame Generation, Tokenization.

I. INTRODUCTION

We watch lots of Youtube videos and download videos on our mobile, TV any social media. In this pandemic situation, all peoples are busy with work so, they are not wasted their time watching the news, or any other video. So, We think making an application which is suitable for this person and some students are lazy in their studies. For that difficulties are going to be broken up by summarization. Summarization means to pick out a meaningful and important word from a given paragraph or chapter .this type Firstly, Video to text summary is very easy but some peoples are not interested in reading so, we are making a summary of a long video and creating a short video and audio clips. which can b easily access from it. After the video summary, this video was converted into text for documentation purposes. we can video as well as a document are collected from it. then this text is converted into any regional language for all people.

II. PROBLEM STATEMENT

To create Video transcript summarization for Marathi language

III. LITERATURE SURVEY

[3.1] Cuneyt M. Taskiran, Arnon Amir, Dulce Ponceleon and Edward J. Delp

Developing efficient representations for video browsing presents some unique algorithmic challenges, as well as new technical challenges.Video is a sequential and information-rich medium. It includes audio and motion, and it carries long temporal contextual relationships between shots and scenes. In contrast to images in an image database, manipulation of video is inherently more complex. For example, images can be represented as thumbnails and users can easily judge relevance of these images at a glance. The same task is very time consuming for video sequences, where one hour is composed of more than 100,000 frames, divided into hundreds of shots. Additionally, the audio, which often conveys much of the information (e.g., a video of a talking head accompanied by slides), is even harder to browse in an efficient manner.

[3.2] Kiran Agre, Ankur Chheda, Sairaj Gaonkar, Prof. Mahendra Patil

As the focus is shifting towards YouTube the paper has proposed system which makes it easy for user to access information contained by the text in these video in efficient and quicker way. The proposed system will convert the text in the video into editable form which is stored in a text file.These videos contain text which adds information to videos and makes it more meaningful. If the text from the videos is converted to editable form, it can be stored efficiently and it will be easier to access it next time. Once the user has watched the educational video, next time he may not want to go through the entire video as he has already watched it and reading the main points may be sufficient for him to revise the topic from that video. In such case the proposed system helps user to get access to the information by converting to text in video to editable form

International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 06 | Jun 2022 www.irjet.net p-ISSN: 2395-0072

A survey on Enhancements in Speech Recognition

Nitin Kendre[1], Vivek Parit[2], Asazad Pathan[3], Akash Kamble[4], Prof. T.V. Deokar[5]

[1,2,3,4] *Students, Department of Computer Science & Engineering, Sanjeevan Engineering and Technology Institute Panhala (Maharashtra)*

[5] *Assistant Professor, Department of Computer Science & Engineering, Sanjeevan Engineering and Technology Institute Panhala (Maharashtra)*

Abstract – *Purpose of This study is to know the enhancements in speech recognition field. From starting of the 21st century people are working and researching in the area of voice recognition. Researchers have contributed many things in this area. Normal speech without any noise is easy to understand by computers, but if the speech includes noise, then it is very difficult to understand by computer and separate the noise from the speech. There are various reasons to have noise in speech like background noise, environmental noise, signal noise, crowded places, etc. In this paper, we are going to present various techniques to enhance the speech recognition system to work in any environment by researchers. Also, some advanced enhancements in speech recognition to use this system in other situations like emotion recognition.*

Key Words: **Robust Speech Recognition, Artificial Intelligence, Feature Extraction, Noise Reduction, Deep Learning**

1. INTRODUCTION

The technique through which a computer (or another sort of machine) recognizes spoken words is known as speech recognition. Essentially, it is conversing with your computer and having it accurately recognize your words. Simply, it means talking to the computer and having it correctly recognize what you are saying.

Voice is the most common and fastest mode of communication, and each human voice has a distinct quality that distinguishes it from the others. As a result, not only for humans but also for automated machines, voice recognition is required for easy and natural interaction [12].

Speech recognition has applications in a variety of sectors, including medicine, engineering, and business. The general problem with speech recognition is speaking rate, gender, age, and the environment in which the discussion is taking place, and the second issue is speech noise [12]. If we can solve these issues with speech recognition, it will be much easier to create goods or systems that people can use everywhere, even in crowded areas or in noisy environments.

Therefore, it is necessary to remove or reduce the amount of noise in a speech to do effective recognition of speech or voice. And to reduce or remove the noise from speech we have to know the basics of recognition. The basic model of speech recognition or speech-to-text model is shown in figure 1. Figure 1 depicts the basic model of speech recognition, also known as the speech-to-text paradigm.

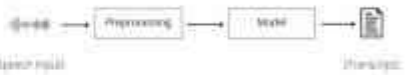


Fig-1: The basic model of Speech Recognition.

1.1 Speech Input

A human voice is captured or recorded using a microphone and sound card connected to the computer as speech input. Modern sound cards can record audio at sampling rates ranging from 16 kHz to 48 kHz, with bit rates ranging from 8 to 16 bits per sample, and playback speeds of up to 96 kHz [12].

1.2 Preprocessing

Signal processing takes place in this step. This process converts an analog signal to a digital signal and does noise reduction, as well as changes audio frequencies to make it machine-ready [12][13].

1.2.1 Feature Extraction

The next step in pre-processing is to choose which features will be valuable and which will be unnecessary. We need to understand MFCCs (Mel Frequency Cepstral Coefficients) in order to extract features.

1.2.2 MFCCs

MFCCs is a method for extracting features from audio signals. It divides the audio signal's frequency bands using the MEL scale, then extracts coefficients from each frequency band to create a frequency separation. The Discrete Cosine Transform is used by MFCC to conduct this operation. The MEL scale is based on human sound

International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 06 | Jun 2022 www.irjet.net p-ISSN: 2395-0072

A survey on Enhancements in Speech Recognition

Nitin Kendre[1], Vivek Parit[2], Asazad Pathan[3], Akash Kamble[4], Prof. T.V. Deokar[5]

[1,2,3,4] *Students, Department of Computer Science & Engineering, Sanjeevan Engineering and Technology Institute Panhala (Maharashtra)*

[5] *Assistant Professor, Department of Computer Science & Engineering, Sanjeevan Engineering and Technology Institute Panhala (Maharashtra)*

Abstract – *Purpose of This study is to know the enhancements in speech recognition field. From starting of the 21st century people are working and researching in the area of voice recognition. Researchers have contributed many things in this area. Normal speech without any noise is easy to understand by computers, but if the speech includes noise, then it is very difficult to understand by computer and separate the noise from the speech. There are various reasons to have noise in speech like background noise, environmental noise, signal noise, crowded places, etc. In this paper, we are going to present various techniques to enhance the speech recognition system to work in any environment by researchers. Also, some advanced enhancements in speech recognition to use this system in other situations like emotion recognition.*

Key Words: **Robust Speech Recognition, Artificial Intelligence, Feature Extraction, Noise Reduction, Deep Learning.**

1. INTRODUCTION

The technique through which a computer (or another sort of machine) recognizes spoken words is known as speech recognition. Essentially, it is conversing with your computer and having it accurately recognize your words. Simply, it means talking to the computer and having it correctly recognize what you are saying.

Voice is the most common and fastest mode of communication, and each human voice has a distinct quality that distinguishes it from the others. As a result, not only for humans but also for automated machines, voice recognition is required for easy and natural interaction [12].

Speech recognition has applications in a variety of sectors, including medicine, engineering, and business. The general problem with speech recognition is speaking rate, gender, age, and the environment in which the discussion is taking place, and the second issue is speech noise [12]. If we can solve these issues with speech recognition, it will be much easier to create goods or systems that people can use everywhere, even in crowded areas or in noisy environments.

Therefore, it is necessary to remove or reduce the amount of noise in a speech to do effective recognition of speech or voice. And to reduce or remove the noise from speech we have to know the basics of recognition. The basic model of speech recognition or speech-to-text model is shown in figure 1. Figure 1 depicts the basic model of speech recognition, also known as the speech-to-text paradigm.

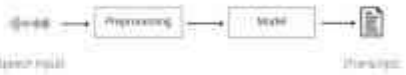


Fig-1: The basic model of Speech Recognition.

1.1 Speech Input

A human voice is captured or recorded using a microphone and sound card connected to the computer as speech input. Modern sound cards can record audio at sampling rates ranging from 16 kHz to 48 kHz, with bit rates ranging from 8 to 16 bits per sample, and playback speeds of up to 96 kHz [12].

1.2 Preprocessing

Signal processing takes place in this step. This process converts an analog signal to a digital signal and does noise reduction, as well as changes audio frequencies to make it machine-ready [12][13].

1.2.1 Feature Extraction

The next step in pre-processing is to choose which features will be valuable and which will be unnecessary. We need to understand MFCCs (Mel Frequency Cepstral Coefficients) in order to extract features.

1.2.2 MFCCs

MFCCs is a method for extracting features from audio signals. It divides the audio signal's frequency bands using the MEL scale, then extracts coefficients from each frequency band to create a frequency separation. The Discrete Cosine Transform is used by MFCC to conduct this operation. The MEL scale is based on human sound

International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 06 | Jun 2022 www.irjet.net p-ISSN: 2395-0072

E-Health Care Cloud Solution

Ajay Hasole[1], Aniket Khatavkar[2], Mahesh Kamble[3], Rushikesh Alase[4], Yatiraj Korade[5], Prof. V.A. Shevade[6]

[1,2,3,4,5] *Students, B. Tech Computer Science and Engineering, SETI, Kolhapur, Maharashtra, India.*
[6] *Assistant Professor, Dept. of Computer Science and Engineering, Sanjeevan Engineering and Technology Institute Kolhapur, Maharashtra, India.*

Abstract - *Previously, patient reports were submitted to hospitals in the form of documents. There will be more space to keep patient reports. When an old patient comes to the hospital, it takes a lot of time to find his document. Its total wastage of paper. The documentation report is not secure. anyone can destroy the document easily and can stop all this, we have come up with a new idea: It's called an E-health cloud solution. Each patient report will save on the cloud. This Data will be safe and secure. It is accessible very easily Cloud computing is a new way of delivering computing resources and services Many managers and experts believe it has the potential to improve healthcare services, advance healthcare research, and transform health-information technology. The information is critical for making decisions and providing the best possible care to patients. Cloud computing is a cost-effective method for collecting, storing, and exchanging real-time data between healthcare organizations. Cloud infrastructure is characterized by high throughput and large storage volumes, both of which are critical for effective data analysis of large patient populations. Security and sequestration are the major enterprises that are answered using pall- grounded healthcare services. Data security continues to be one of the top enterprises for cloud computing, an issue that is been boosted by recent high-profile attacks in healthcare. The encryption result has to be quick and easy to provision and give high situations of protection without immolating network performance. It's another way to give a critical subcaste of security to cover the guests. In this work, we're interested in data encryption in the healthcare pall. Authentication is the first step for data security, through which druggies can establish evidence of identity before data access from the system. In a pall computing terrain, conventional authentication styles don't give strong security against the moment's most ultramodern means of attack. Cloud needs a dynamic approach for stoner authentication, which should include more than one authentication credential. we propose a data security armature with a robust, dynamic, and doable Multi-Factor Authentication scheme which integrates further than one factor like OTP for cloud stoner authentication.*

Key Words: **Health Care, Cloud Computing, AES Algorithm, Patient History Reports, MFA.**

1. INTRODUCTION

In this project, the hospital can just use the services of the cloud to upload patient data. In healthcare system can manage the administration and required IT requirements that have the potential to retrieve the real-time information of patients without any delay. The uploaded data we can access through the cellular network and remote devices we can share the medical history of a patient helps doctors to treat a patient properly. The e-health (electronic health) system is one of many cloud services that stores and shares patient medical data between healthcare service providers and patients using computer or electronic systems and cloud technology. The health data/patient records are kept in a semi-trusted third-party supplier that is the cloud. Therefore, its security has become the main concern as the data should not be accessible to an unauthorized person To remain cost-effective, efficient, and timely while providing high-quality services, health care, like any other service industry, requires continuous and systematic innovation. Many managers and experts predict that cloud computing can improve health care services, benefit healthcare research, and change the face of information technology (IT). Several informatics breakthroughs have shown that cloud computing has the potential to solve these problems. Despite the many benefits associated with cloud computing applications for health care, there are also management, technology, security, and legal issues to be addressed.

2. PROBLEM DEFINITION

Already, persistent reports were submitted to healing within the frame of difficult duplicate archives. There will be more space to keep understanding reports. When an ancient persistent comes to the clinic, it takes a part of the time to discover his report. It adds up to the wastage of paper. The hard copy documentation report isn't secure. Anybody can annihilate the archives effectively. So anticipate this, we have come up with an idea called an E-healthcare cloud solution. Each patient's report will spare on the cloud. In this, information will be secure and secure. It is available exceptionally effortlessly.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:07/July-2022 Impact Factor- 6.752 www.irjmets.com

BLOCK CHAIN BASED SECURE DATA STORAGE ON CLOUD

Kranti Warke*1, Devika Mahindre*2, Vishakha Patil*3, Vaibhavi Shinde*4, Shrutika Hapse*5, Prof. V.A. Shevade*6

*1,2,3,4,5Students, B.Tech Computer Science And Engineering SETI, Kolhapur, Maharashtra, India.

*6Assistant Professor, Dept. Of Computer Science And Engineering, Sanjeevan Engineering And Technology Institute, Kolhapur, Maharashtra, India.

ABSTRACT

In this paper, we present a security that provide to the confidential data. cloud storage is used for the storing an important data. Cloud storage has many benefits over traditional physical storage method, including more accessible data storage. Using cloud, you can easily share file and collaborate with others. A blockchain is a type of digital database that is used to store a huge amount of information. Blockchain is one of the safe growing information technologies that help in providing security to the data. Blockchain is the technology that helps the data from hacking. Once the data gets initialized by the user, it cannot be exchanged or modified, it provides more and more security to user data. Data privacy is unharmed because the user data cannot be shared with authorized and unauthorized users in the network except the current use. On the other hand, encryption and decryption techniques will also be used along with the blockchain techniques Encryption is a process which transforms the original information into an unrecognizable form. In this project, an implementation of the AES encryption and decryption algorithm is used. This will provide security to the confidential data. For more security purpose we have used blockchain technique with distributed system. This data will be securely stored on cloud.

Keywords: Cloud, Blockchain, Encryption, Decryption.

I. INTRODUCTION

Cloud computing is the recent arising technology of IT industry to solve the problems and difficulties of business database services such as storage capacity, performance, stability, security, load and many other issues. Cloud storage was used to provide the cloud-based data storage platform. The computing tasks are distributed to a large number of computer systems, so that all applications can access the calculation capability, storage space and software services. Definition of Cloud computing changes from professionals to professionals and from individual to individual. Everyone has their own way of defining cloud computing. e primary goal of cloud computing is to offer the organisation services that are both affordable and effective. Infrastructural and data management costs are decreased as a result. vast services are offered by cloud providers. How to secure, safeguard, and process data is the core objective of cloud computing. AES Algorithm is of the out sourced data in cloud environment the "effective automatic data reading protocol" and multi-server data compression algorithm. AES is an algorithm for performing encryption which is a series of well-defined steps that can be followed as a procedure. The original information is known as plaintext, and the encrypted form as cipher text. Plain text converted into the cipher text, that is not in the readable format. To convert this cipher text into plain text there is reverse technique that decryption technique it will convert cipher text into the plain text means in readable format.

Blockchain plays a key part in the decentralised peer-to-peer system that is driving the rapid development of information technology in security. Blockchain technologies like the hashing algorithm, public/private key encryption, and transaction ledgers make this possible. Every piece of data is kept in a different decentralised place. If hackers attempt to access it, they first obtain encrypted data and then only a portion of the file, not the entire thing. This protects documents stored in cloud storage powered by blockchain. Blockchain is having a good effect and making it easier, faster, and more reliable to use storage, transactions, and business operations. The way forward is to combine blockchain and cloud to benefit from increased security and decentralisation, which improves authorisation, privacy, and efficiency.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 9, June 2022
Impact Factor: 6.252

Traffic Analysis using Image Processing to Alert Traffic Control

Nahida Chaus[1], Ayesha Pailwan[2], Sharlet Chavan[3], Rani Nagavkar[4], Prof S. S. Kumbhar[5]
Students, Department of Computer Science & Engineering[1,2,3,4]
Assistant Professor, Department of Computer Science & Engineering[5]
Sanjeevan Engineering and Technology Institute, Panhala, Maharashtra, India

Abstract: *In this paper, we present a scheme for traffic analysis using Image Processing to alert traffic control. In this, the vehicles are not being detected by sensors as we are detecting by images with the use of python language we are going to implement it in our project. Once image is captured from digital media, it is fed into image processing after that it detects vehicles from image using open cv libraries, after that at the end vehicles are detected on basis on vehicle count, and time will be set as per so reduce the road traffic congestion. This system contains the solution to three problems of traffic system. First one being the pre-defined set of timings set for each traffic signal despite the density circumstances. For this we have changed the signal timings. The working would be as follows, in a traffic junction of four lanes the density is measured on each lane at distance of 50 meters through the Image Processing. After that count the vehicle and turn on green light for time period deepening on vehicle count ratio. this is done so that the lane having highest density is allowed to clear the traffic first, the other lanes will be given green signal after this in a circular pattern. If in cases where the density is greater, the signal timing is increased seconds.*

Keywords: Traffic control, Computer Vision, Image Processing, Edge Detection, artificial intelligence.

I. INTRODUCTION

One of the very essential issue in our country is road congestion. Most nations have automobiles, buses, trucks, motor vehicles, motors, scooters and bicycles. However, in India, more n more to the current routine small scale transportation, and together substantially to the traffic, are networks of vehicles, two wheelers still as heavy cars. This has led to the more n more of traffic, higher number of accidents, cases and increase in commuting time over the years.

Traffic means a lot of vehicles coming and going on the road and in a big city a lot of vehicles are seen on the road . And it has become very difficult to manage this traffic so there are a lot of accidents on the road. And this traffic is having a huge impact on people's health, spreading various diseases. we have to use a lot of techniques to stop this traffic. People don't use public transport, they have their own private vehicles, so the traffic is increasing, we have to reduce , and use image processing to control traffic and alert traffic signals.

The intention in our research paper is that we are going to count the vehicles on the road and Depending on how many vehicles are on the road, we will decide which road to assign the time to traffic signals . Each road will have a camera that will take a photo every second of every time And from that photo, the time will be decided according to which road have the vehicles and how many time assign to the road. All these techniques will not only decrease the traffic but also control the traffic and reduce the accidents.

1.1 Problem Statement

System for controlling traffic congestion on road using image processing methods to detect vehicle on road and schedule traffic signal light pattern to manage and avoid vehicle congestion.

II. RELATED WORK

In [1] this research the author has suggested to implement a intelligent traffic controller using real time computer vision. Filtering method is used to capture the image and video, i.e. it filters the image and removes the unwanted background and only focuses on the cars as an object. Image processing technique is used to detect the count of cars on the road and the detection of cars is also done by video. It follows these steps:

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

THE VIRTUAL DRESSING ROOM

Diksha Saswade*1, Vaidehee Batte*2, Sharvari Bhosale*3,
Mugdha Naikwadi*4, Pranali Patil*5, Prof S.S. Kumbhar*6

*1,2,3,4,5Students, Department Of Computer Science & Engineering, Sanjeevan Engineering And Technology Institute Panhala Maharashtra, India.

*6Assistant Professor, Department Of Computer Science & Engineering, Sanjeevan Engineering And TechnologyInstitute Panhala Maharashtra, India.

ABSTRACT

Design coordination is one among the self- articulations which are never-endingly in requests. searchingfor good clothing, could be a period overpowering errand aswell as a few variables should be remembered. In this paper, we are presenting a "virtual changing area (VDR)" is the web-based likeness an in-store evolving room. Augmented reality is innovation that grows our actual world, adding layers of computerized data onto it. Augmented reality adds advanced component to live view byutilizing cameras on sensors. Our inspiration here is to expand the time effectiveness and moreaking the openness of garments take a stab at by making a virtual dressing room climate The framework would be stage autonomous and comprised of all the free-source improvement apparatuses so that whenever taken industrially later we will keep the expense as low as could be expected Augmented the truth is the inspiration driving any AR application. This application is carried out utilizing openCV and web camera to catch video. When the video is caught, is distinguishes the foundation and object of human Augmented the truth is immediate and backhanded perspective on genuine word components that are augmented on programming

Keywords: Open CV (Computer Vision), Virtual Dressing Room, Augmented Reality, Windows, Web Camera.

I. INTRODUCTION

A lot of shoppers have encountered a problem that trying clothes in clothing stores is usually a time consuming activity especially during peak hours such as weekends, it might not indeed, even be feasible to take a stab at garments in such cases as web based shopping. Also Due to security reasons there is limitation on number of garments thatcan be taken for trial at a time. To overcome these problems we aim to develop a virtual trial room using augmented reality. A virtual dressing room is the web based likeness the near-ubiquitous in-store changing room – that is, it enables customers to take a stab at garments to really look at least one of size, fit or style, but virtually.

This application depends on programming which assists in addressing with yielding from the skeleton, separated from picture (taken from camera). In the event that an individual is remaining before the camera, the individual will actually want to choose wanted garments. Likewisein future, we can stretch out our framework to suggest some garments which will suit on that individual relying upon his skin tone. In any case, an issue for purchasing garments online is that client can't attempt the item before he/she get that item. The inclination later dressing on influences the client choice about purchasingthe garments. Accordingly, there is a rising interest to create virtual changing area to recreate the perception of dressing. With the help of cutting edge AR development (for example adding computer vision and item acknowledgment) the data about the encompassing genuine universe of the client becomes intuitive and carefully manipulable. Fake data about the climate and its articles can be overlaid on this present reality. This application involves OpenCV for recognizing the client and to change the variety and logo as per client's decision. Contrasted with other existing Virtual Trial Room frameworks, key contrast is the absence of any exclusive equipment parts of peripherals. Over the most recent couple of a long time there have been a number of endeavors in making logos and changing shade of T- shirts carefully. By the significance of Virtual Reality and Expanded Reality in Technical Society, new advances can be embraced in this worry like Webcam, advanced mobile phones to take a stab at various varieties and various logos on T-shirt. Utilizing cameras and sensors, these capabilities assist VR frameworks with examining the client's current circumstance and identify the headset's area. In this way, PC vision and augmented reality cooperate to make items more refined and client responsive. You can peruse one of our past articles to diginto a few additional subtleties on how PC vision functions.

Holy-wood Academy, Kolhapur's
SANJEEVAN ENGINEERING AND TECHNOLOGY INSTITUTE
Sanjeevan Knowledge City, Somwar Peth- Injole, Panhala, Tal. Panhala, Dist. Kolhapur
Pin- 416 201. (Maharashtra) Phone : 0231 - 2686600, 21 Fax : 0231 - 2686629
Approved By AICTE, New Delhi ■ Recognized by Govt. of Maharashtra & DTE ■ Affiliated to Dr. Babasaheb Ambedkar Technological University, Raigad (DBATU).
Website : www.seti.edu.in Email : principal@seti.edu.in / office@seti.edu.in
EN 6315

3.2.1 Number of papers published per teacher in the Journals notified on UGC website during the year

Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal
Experimental Study on Structural Light Weight Concrete for Partial Replacement to Coarse Aggregate by Sintered Fly Ash Aggregate	AMIT C.THOKE	CIVIL	IJARSCT	May-22	ISSN (Online) 2581-9429	
Flexural Strengthening of Light Weight Reinforced Concrete Beams by Using Glass Fiber Reinforced Polymer	AMIT C.THOKE	CIVIL	IRE Journals	May-22	ISSN: 2456-8880	

IRE JOURNALS

ICONIC RESEARCH AND ENGINEERING JOURNALS

[An International Open Access, Peer-reviewed, Refereed Journal]

Certificate of Publication

The board of IRE Journals
is hereby awarding this certificate

PROF. A. C.THOKE

In recognition of the publication of the paper entitled

FLEXURAL STRENGTHENING OF LIGHT WEIGHT REINFORCED CONCRETE BEAMS BY USING GLASS FIBER REINFORCED POLYMER

Publication In e-Journal

VOLUME 5 ISSUE 11 MAY 2022

PAPER ID :- 1703477

Dhaval Bhatt

EDITOR IN CHIEF

ICONIC RESEARCH AND ENGINEERING JOURNALS

Website : www.irejournals.com | Email ID : irejournals@gmail.com | ISSN : 2456 - 8880

International Journal of Advanced Research in Science, Communication and Technology

IJARSCT

Certificate of Publication

INTERNATIONAL STANDARD SERIAL NUMBER
ISSN NO: 2581-9429

This is to certify that

Prof. A. C. Thoke

Sanjeevan Engineering & Technology Institute, Panhala, Kolhapur, Maharashtra, India

has published a research paper entitled

Experimental Study on Structural Light Weight Concrete for Partial Replacement to Coarse Aggregate by Sintered Fly Ash Aggregate

in IJARSCT, Volume 2, Issue 3, May 2022

Certificate No: 052022-A865
www.ijarsct.co.in

Crossref
DOI: 10.48175/IJARSCT-3716
www.doi.org
www.crossref.org

Scientific Journal Impact Factor 6.252 Journal Impact Factor
www.sjifactor.com

Editor-in-Chief

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

Experimental Study on Structural Light Weight Concrete for Partial Replacement to Coarse Aggregate by Sintered Fly Ash Aggregate

Swaroop Sachin Jagadale[1], Raviraj Dinkar Patil[2], Shivani Uttam Latwade[3] and Prof. A. C. Thoke[4]
Final Year B.Tech Students, Department of Civil Engineering[1,2,3]
Assistant Professor, Department of Civil Engineering[4]
Sanjeevan Engineering & Technology Institute, Panhala, Kolhapur, Maharashtra, India

Abstract: *The use of Lightweight concretes has gained acceptance and popularity worldwide in the recent years in the construction and development of both the infrastructure and residential buildings. Light weight aggregate concrete has become more popular in recent advancements owing to the tremendous advantages it offers over the conventional concrete but at the same time light in weight and strong enough to be used for structural purposes. Replacement of natural aggregate with concrete such as light weight concrete by using sintered fly ash aggregate (natural aggregate), The main disadvantage of conventional concrete it is high self -weight. This heavy self-weight will make it to some extent an uneconomical structural material. Light weight concrete having low density facilitates reduction of dead load and to increase thermal insulation.*

Keywords: Structural Light Weight Concrete

I. INTRODUCTION

1.1 Review Stage Importance of Aggregate

Aggregate in concrete is structural filler, but its role is more important than what that simple statement implies. Aggregate occupies most of the volume of the concrete. It is the stuff that the cement paste coats and binds together.

The composition, shape, and size of the aggregate all have significant impact on the workability, durability, strength, weight, and shrinkage of the concrete. Aggregate can also influence the appearance of the cast surface, which is an especially important consideration in concrete countertop mixes. Aggregates contribute to overall strength of concrete. Aggregate is inexpensive and it does not enter into the complex chemical reactions with water. To get better results with concrete, it is necessary the gradation of aggregates. Good gradation of aggregates can increase the workability of concrete. Good gradation can also reduce the air voids. Economy is another reason for thoughtful aggregate selection. You can often save money by selecting the maximum allowable aggregate size.

Using larger coarse aggregate typically lowers the cost of a concrete mix by reducing cement requirements, the costliest ingredient. Less cement (within reasonable limits for durability) will mean less water if the water-cement (w/c) ratio is kept constant. A lower water content will reduce the potential for shrinkage and for cracking associated with restrained volume change

1.2 Problems of Natural Aggregates with Respect to Environment

The problem we face with natural aggregate is Silica alkali reaction due to reactive aggregates. In this the reactive aggregates in presence of moisture and alkaline medium produce an expansive gel which exerts bursting pressure on concrete and cracks the matrix of concrete. Nearly every community in nearly every industrialized or industrializing country is dependent on aggregate resources (sand, gravel, and stone) to build and maintain their infrastructure. Unfortunately, aggregate resources necessary to meet societal needs cannot be developed without causing environmental impacts.

The most obvious environmental impact of aggregate mining is the conversion of land use, most likely from undeveloped or agricultural land use, to a (temporary) hole in the ground. This major impact is accompanied by loss of habitat, noise, dust, blasting effects, erosion, sedimentation, and changes to the visual scene. Mining aggregate can lead to serious environmental impacts. Societal pressures can exacerbate the environmental impacts of aggregate development.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

In areas of high population density, resource availability, combined with conflicting land use, severely limits areas where aggregate can be developed, which can force large numbers of aggregate operations to be concentrated into small areas. Doing so can compound impacts, thus transforming what might be an innocuous nuisance under other circumstances into severe consequences. In other areas, the rush to build or update infrastructure may encourage relaxed environmental or operational controls. Under looser controls, aggregate operators may fail to follow responsible operational practices, which can result in severe environmental consequences. The geologic characteristics of aggregate deposits (geomorphology, geometry, physical and chemical quality) play a major role in the intensity of environmental impacts generated as a result of mining.

1.3 Sintered Fly Ash Aggregate

Table 1: Properties of Sintered Fly Ash Aggregate

Product :	Sintered fly ash light weight aggregates.
Application:	As aggregate in concrete for lightweight construction works.
Features:	The fly ash nodules made with the help of water are fired at 1200 degree Celcius. The fine particles of fly ash melt at the surface and are welded together. The nodules crumble during the sintering process. Mixing 5, 10 & 20% plastic clay in fly ash produce good quality aggregate. The sintered fly ash aggregate concrete is spherical in shape, possessing 5-20 mm size and light grey color. Water absorption is 15-20% in uncrushed material and 40-50% in crushed material; bulk density: 640-750 kg/m3 , aggregate crushing strength: 5-8.5 t.
Economy:	50 tpd.
Equipment:	Sintering machine, ribbon mixer, conveyor, handling equipment.
Raw Materials:	Fly ash, plastic clay.

II. CONCRETE MIX DESIGN

1. Cement : Birla Shakti Cement (M43 Grade)
2. Grade of concrete : M20
3. Target strength = fck + (1.65+S)
   = 20+ (1.65 x 4)
   = 26.60 N/MM^2
4. Specific Gravity
   a. Cement : 3.15
   b. Sand : 2.99
   c. Natural Aggregate : 3.12
   d. Sintered Fly Ash Aggregate : 2.02
5. Cement content : 335 kg/ m3
6. W/C ratio : 0.450
7. Cementitious material content : 335x 1.0 = 335 Kg/m^3
8. Water content : 335 x 0.450 = 150.75 Kg/m^3
9. Sand content[fa] : 892.595 Kg/m^3
10. Coarse aggregate[Ca] : 1274.81KG/M^3

Table 2: Final Mix Proportion using natural aggregate

Cement	Sand	Natural Aggregate	Water	Chemical
335	892.6	1273.063	150.75	0.8% of Cement by Weight
1	2.664	3.80	0.45	

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

Table 3: Work done using Replacement of cement with Sintered Fly Ash Aggregate

Sr. No.	Design IDS	Natural Aggregate	Sintered Fly Ash Aggregate
1	A	100%	0%
2	B	90%	10%
3	C	80%	20%
4	D	70%	30%
5	E	60%	40%
6	F	50%	50%

Table 4: Material Required for Casting 6 Cubes of Each Replacement

Design ID	Cement (Kg)	Sand (Kg)	Coarse Agg. (Kg)	Sintered Fly Ash Agg. (Kg)	Water (Kg)
A	7.919	21.099	30.0923	-	4.088
B	7.4621	19.8824	25.5568	1.365	3.6079
C	7.4622	19.8822	22.7172	2.7304	0.0792
D	7.4620	19.8825	19.8772	4.096	3.8531
E	7.4620	19.8825	17.0379	5.7684	3.8531
F	7.4642	19.8884	14.1821	6.8284	3.3587

III. RESULT ANALYSIS

3.1 With *Respect* to Density

A. 7 Days Cube Density Result using Sintered Fly Ash Aggregate

Table 5: 7 Days Cube Density Result using Sintered Fly Ash Aggregate

ID Mark	Weight of Cube Kg	Volume	Density	Average Density KN/m^3
A0	9.200	3441782.2	26.196	26.027
A0	9.100	3430347.4	25.997	
A0	8.960	3391675.7	25.889	
A10	8.680	3387344.0	25.112	24.920
A10	8.660	3403145.0	24.938	
A10	8.578	3402043.8	24.710	
A20	8.531	3397537.0	24.607	24.519
A20	8.510	3415656.2	24.416	
A20	8.610	3439481.5	24.532	
A30	8.210	3374736.0	23.841	23.735
A30	8.167	3368250.0	23.762	
A30	8.210	3408825.0	23.603	
A40	7.795	3287908.0	23.234	22.713

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

ID Mark	Weight of Cube Kg	Volume	Density	Average Density KN/m^3
A40	7.817	3407639.3	22.481	
A40	7.681	3356986.0	22.423	
A50	7.650	3415630.0	21.949	
A50	7.680	3434753.4	21.912	21.754
A50	7.518	3442722.0	21.401	

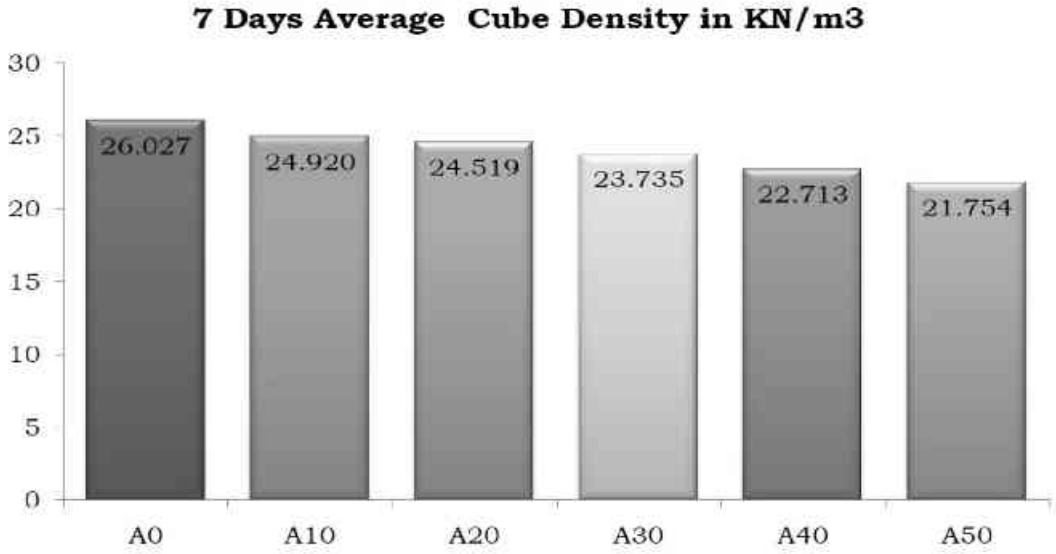


Figure 1: 7 Days Average Cube Density Result using Sintered Fly Ash Aggregate

B. 28 Days Cube Density Result using Sintered Fly Ash Aggregate

Table 6: 28 Days Cube Density Result using Sintered Fly Ash Aggregate

ID Mark	Weight of Cube Kg	Volume	Density	Average Density KN/m^3
A0	9.240	3456530.4	26.197	
A0	9.205	3458827.1	26.081	26.102
A0	9.120	3433832.1	26.028	
A10	8.750	3424583.3	25.040	
A10	8.820	3447385.8	25.073	25.110
A10	8.792	3416539.1	25.219	
A20	8.240	3413075.8	23.660	
A20	8.350	3429101.7	23.863	23.884
A20	8.315	3377199.0	24.129	
A30	8.105	3411029.6	23.286	23.214

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

ID Mark	Weight of Cube Kg	Volume	Density	Average Density KN/m^3
A30	8.200	3466632.8	23.181	
A30	8.098	3424381.4	23.175	
A40	7.900	3372726.0	22.955	
A40	7.865	3408453.4	22.613	22.526
A40	7.762	3456277.6	22.009	
A50	7.650	3388323.7	22.126	
A50	7.680	3441632.3	21.869	21.796
A50	7.518	3443873.0	21.393	

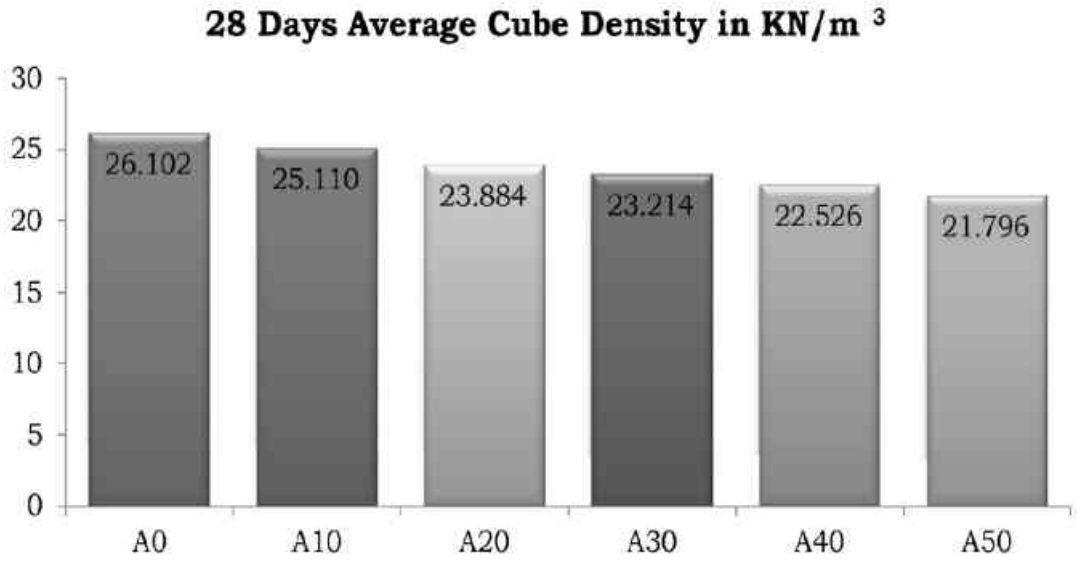


Figure 2: 28 Days Average Cube Density Result using Sintered Fly Ash Aggregate

C. 28 Days Beam Density Result using Sintered Fly Ash Aggregate

Table 7: 28 Days Beam Density Result using Sintered Fly Ash Aggregate

ID Mark	Weight of Beam Kg	Volume	Density	Average Density KN/m^3
A0	13.310	5000000	26.088	
A0	13.650	4970000	26.754	26.447
A0	13.520	4980000	26.499	
A10	12.817	4955000	25.121	
A10	12.805	5050000	25.098	25.135
A10	12.850	5060000	25.186	
A20	12.168	5012500	23.849	23.823
A20	12.198	5028000	23.908	

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

ID Mark	Weight of Beam Kg	Volume	Density	Average Density KN/m^3
A20	12.098	5032500	23.712	
A30	11.821	5005000	23.169	23.095
A30	11.795	4990000	23.118	
A30	11.733	4988000	22.997	
A40	11.528	4989000	22.595	22.646
A40	11.586	4965000	22.709	
A40	11.548	5012500	22.634	
A50	10.867	5035000	21.299	21.261
A50	10.834	5050000	21.235	
A50	10.842	5005000	21.25	

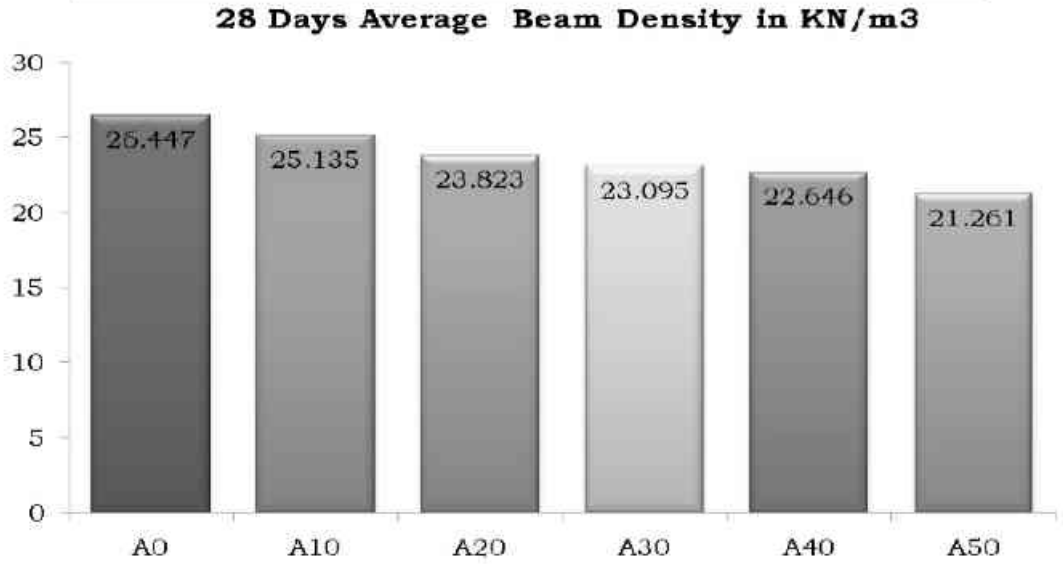


Fig 3. 28 Days Average Beam Density Result using Sintered Fly Ash Aggregate

D. 28 Days Cylinder Density Result using Sintered Fly Ash Aggregate

Table 8: 28 Days Cylinder Density Result using Sintered Fly Ash Aggregate

ID Mark	Weight of Cylinder Kg	Volume	Density	Average Density KN/m^3
A0	4.205	1546457	26.224	26.147
A0	4.197	1548016	26.174	
A0	4.176	1550825	26.043	
A10	4.056	1566475	25.295	25.101
A10	4.005	1543340	24.977	
A10	4.014	1577792	25.033	
A20	3.864	1574645	24.097	23.885
A20	3.805	1547704	23.729	

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

ID Mark	Weight of Cylinder Kg	Volume	Density	Average Density KN/m^3
A20	3.821	1558953	23.829	
A30	3.715	1563652	23.168	23.116
A30	3.700	1576607	23.075	
A30	3.705	1543340	23.106	
A40	3.658	1577792	22.813	22.628
A40	3.622	1574645	22.588	
A40	3.605	1547704	22.482	
A50	3.429	1560519	21.384	21.542
A50	3.438	1555199	21.441	
A50	3.496	1580929	21.802	

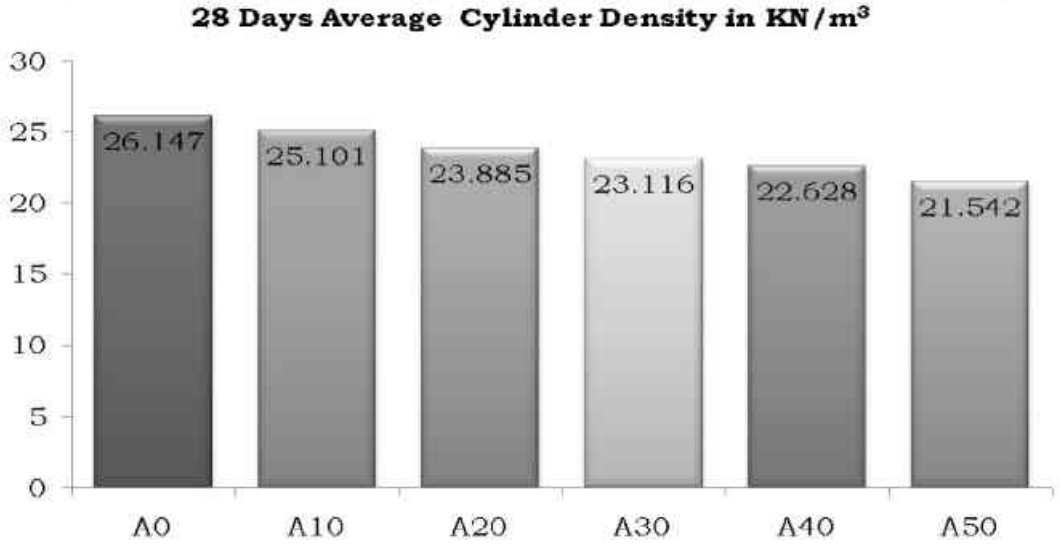


Figure 4: 28 Days Average Cylinder Density Result using Sintered Fly Ash Aggregate

3.2 With Respect to Strength

A. 28 Days Compressive Strength using Sintered Fly Ash Aggregate

TABLE 9: 28 Days Compressive Strength Result using Sintered Fly Ash Aggregate

Cube ID Mark	Compressive Strength in N/mm^2	Average Compressive Strength in N/mm^2
A0	37.445	36.677
A0	36.574	
A0	36.011	
A10	34.51	33.924
A10	33.871	
A10	33.389	
A20	32.544	32.257

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

Cube ID Mark	Compressive Strength in N/mm^2	Average Compressive Strength in N/mm^2
A20	31.89	
A20	32.337	
A30	30.7	30.247
A30	29.796	
A30	30.245	
A40	29.053	28.392
A40	28.329	
A40	27.794	
A50	24.609	25.181
A50	25.296	
A50	25.638	

B. 28 Days Flexural Strength using Sintered Fly Ash Aggregate

Table 10: 28 Days Flexural Strength Result using Sintered Fly Ash Aggregate

ID Mark	Flexural Strength in N/mm^2	Average Flexural Strength in N/mm^2
A0	4.4	4.467
A0	4.4	
A0	4.6	
A10	4.4	4.267
A10	4.2	
A10	4.2	
A20	3.6	3.667
A20	3.8	
A20	3.6	
A30	3.8	3.4
A30	3.2	
A30	3.2	
A40	3.4	3.267
A40	3.2	
A40	3.2	
A50	3	3.067
A50	3	
A50	3.2	

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

C. 28 Days Split Tensile Strength using Sintered Fly Ash Aggregate

Table 11: 28 Days Flexural Strength Result using Sintered Fly Ash Aggregate

ID Mark	Split Tensile Strength in N/mm^2	Average Split Tensile Strength in N/mm^2
A0	6.682	6.576
A0	6.491	
A0	6.555	
A10	6.3	6.342
A10	6.3	
A10	6.427	
A20	5.855	5.855
A20	5.918	
A20	5.791	
A30	5.218	5.239
A30	5.155	
A30	5.345	
A40	4.836	4.858
A40	4.964	
A40	4.773	
A50	4.518	4.455
A50	4.645	
A50	4.2	

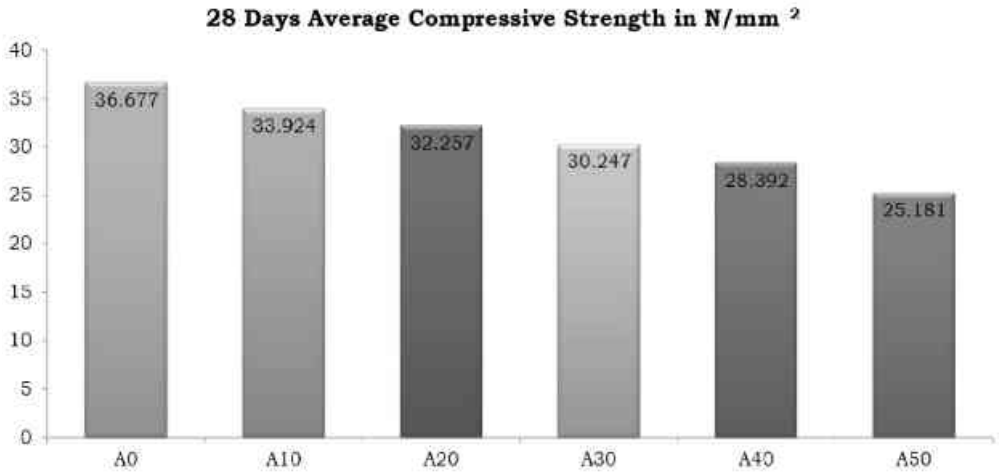


Figure 5:28 Days Average Compressive Strength Result using Sintered Fly Ash Aggregate

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

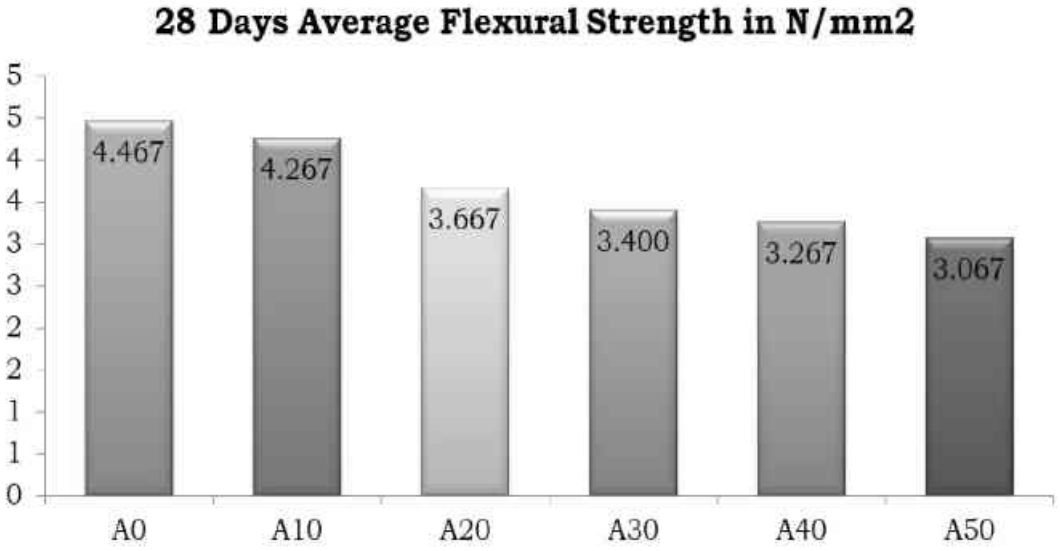


Figure 6: 28 Days Average Flexural Strength using Sintered Fly Ash Aggregate

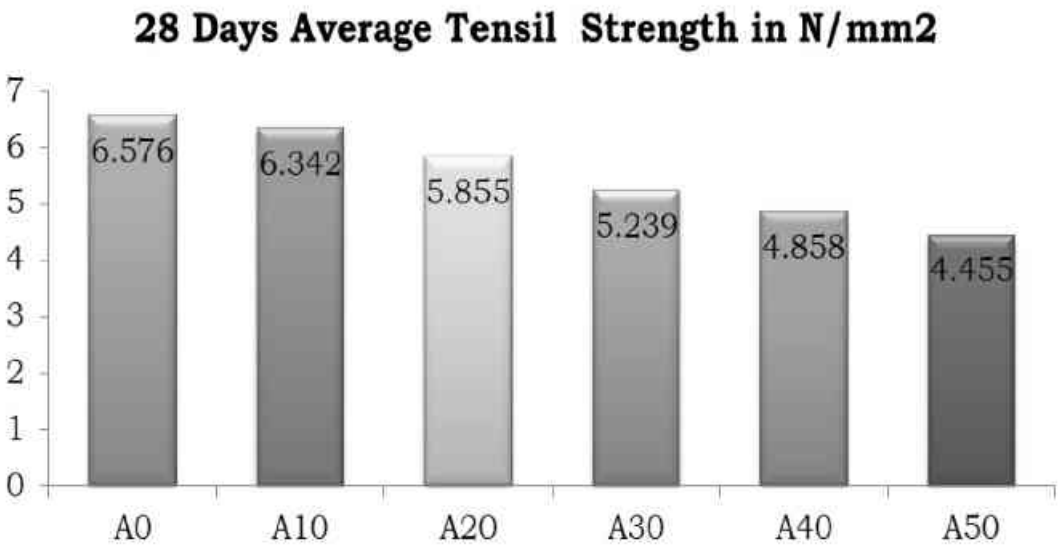


Figure 7: 28 Days Average Tensile Strength using Sintered Fly Ash Aggregate

IV. CONCLUSION

4.1 Density

For M20 grade of concrete design mix, it has been seen that density goes on decreasing with increase in the percentage of pumice. Density is maximum for conventional concrete. We achieved optimum density required for light weight concrete at 50% are 20.361 KN/m3 ,20.565 KN/m3 ,20.365 KN/m3 respectively. It has been observed that the density at 50% replacement is lowered by 16.12%, 15.29% &16.41% than conventional concrete in cube, beam and cylinder respectively.

Table 12: Density of concrete

Grade of concrete	**M20**
28 Days density of cube Conventional Concrete (N/mm^2) For concrete design mix	24.274

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

28 Days density of beam Conventional Concrete (N/mm^2) For concrete design mix	24.276
28 Days cylinder of Conventional Concrete (N/mm^2) For concrete design mix	24.365
28 Days density of Cube for 50% replacement sintered fly ash (N/mm^2)	20.361
28 Days density of beam for50% replacement sintered fly ash(N/mm^2)	20.565
28 Days density of cylinder for50% replacement sintered fly ash(N/mm^2)	20.365

4.2 Strength

For M20 grade of concrete design mix, it has been seen that compressive strength decreases with increase in pumice percentage. Compressive strength is maximum for 0 % i.e. for conventional concrete. We achieved optimum Compressive Strength for 50 % replacement of sintered fly ash . We achieved the optimum strength of respectively. It has been observed that the strength of concrete for 50% replacement is reduced by 40% (for cube), 27% (in beam) & 14.77% (in beam) respectively.

Table 13: Compressive, Flexural and Split Tensile Strength of concrete for 28 days

Grade of concrete	**M20**
28 Days Compressive Strength of Conventional Concrete (N/mm^2) For concrete design mix	32.24
28 Days Flexural Strength of Conventional Concrete (N/mm^2) For concrete design mix	3.933
28 Days split tensile Strength of Conventional Concrete (N/mm^2) For concrete design mix	5.748
28 Days Compressive Strength of Concrete of 50% replacement sintered fly ash(N/mm^2)	22.435
28 Days flexural Strength of Concrete of 50% replacement sintered fly ash(N/mm^2)	2.867
28 Days split tensile Strength of Concrete of 50% replacement sintered fly ash(N/mm^2)	3.352

Considering all above factors, it is interesting to say that we are slightly near to achieve lightweight concrete at 50 % replacement of natural aggregate by pumice stone in terms of density and strength. And further replacement of artificial aggregate can make difference in the results as per density and strength point of view to achieve light weight concrete.

REFERENCES

[1]. AbdulKadir Ismail Al-hadithi, Self Compacting Light Wt concrete containing ponzo. Aggregate, University of Anbar, Iraq (Jan-2019).
[2]. AFAF Mo.wedatalla, Abubaker A.M Ahmed, Effect of curing and Period of Curing on Concrete,(Sep, 2018).
[3]. Ahsan Ali, Shahid Iqabab, Thomas Bier, Yuri Ribakov, Study on structure of concrete, Germany,(March,2016).
[4]. Amalu R.G, Azeef Ashraf, Muhammat Hussain, Use of waste plastic as fine aggregate substitute in concrete, UKF COE,India, (April,2016).
[5]. Amir Hossein Niknamfar, Generating structural Light wt. Concrete, AIISE, USA (Nov,2017).
[6]. A.R. Pourkhorshidi,M. Najimi, T. Parhizkar (July 2012), "Application of Pumice Aggregate in Structural Lightweight Concrete"Asian Journal of Civil Engineering (Building and Housing) Vol. 13, No. 1, Issue 1.
[7]. Anil Godara, Anurag Maheswari, Ashish Kumar Meena, Rakesh Kumar Saini (May 2018), "Experimental study on light weight concrete with pumice stone as a partial replacement of coarse aggregate", ISSN: 2277-2723, Volume 7, Issue 5.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

[8]. B. Devi Pravallika, K. Venkateswara Rao (2015), "The study on strength properties of light weight concrete using light weight aggregate" International Journal of Science andResearch(IJSR) ISSN: 2319-7064, Volume 5, Issue 6.

[9]. B. Jose Ravindra Raj, V. Ravikumar (April 2017), "Experimental behaviour of light weight aggregate and mineral admixtures based light weight concrete", International Journal of Emerging Technologies in Engineering Research (IJETER) ISSN: 2454-6410, Volume 5, Issue 4.

[10]. Chrdsaqusiri Pattanponga, Properties of cellular light wt. concrete using calcium bottom ash, Portland cement,geopolymer mortar (January,2020).

[11]. Davoud Tavakoli, Use of Waste material in Concrete, Iran (April,2018).

[12]. Dr. K Rajeskhar, M Praveen Kumar, (Sept 2016)Light weight concrete by partial replacement of coarse aggregate by pumice stone and cement by GGBS using M30 grade of concrete.

[13]. Dr.Sunila George, Rajeshwari S, (2015), "Experimental study of light weight concrete by partial replacement of coarse aggregate using pumice aggregate", International Journal of Scientific Engineering and Research (IJSER) ISSN: 2347-3878, Volume 4, Issue 5.

[14]. Dr. U. Rangaraju, Lakshmi Kumar Minapu, M K M V Ratnam, (Dec 2014), "Experimental study on light weight aggregate concrete with pumice stone, silica fume and fly ash as a partial replacement of coarse aggregate" International Journal of Innovative Research in Science, Engineering and Technology ISSN: 2319-8753, Volume 3, Issue 12.

[15]. G. Gunasekaran, Light wt. Concrete by using Cocunut shell as Aggregates, SRM University,India (Feb,2008).

[16]. HirzoMihashi TomoyaNishiwaki, Development of Engineered self healing & self Repairing concrete, Hirzostate of Art-Report (April,2012).

[17]. Issac Ibukan Akinwumi, Curing effect on Properties of high strength Concrete, Convenant University (June, 2014).

[18]. Jose Barrose De Aguiar, Habib Trouzine, Malika Medine, Structural light wt. concrete properties, USA (August,2017).

[19]. K. Mahendra ,K. Venkataramana, L. Hari Krishna ,M.Rajasekhar, S. Prashanth "Experimental Investigation On Structural Lightweight Concrete By Partial Replacement Of Coarse Aggregate Using Pumice Aggregate"International Journal of Engineering Applied Sciences and Technology, 2020 Vol. 4, Issue 11, ISSN No. 2455-2143, Pages 429-433.

[20]. Khashayar Jafari Mostafa, Vahab, Study of Behaviour of Concrete under Axial & Triaxial load, USA (August,2017).

[21]. Kothari Akash and Chaudhari Balasaheb(April 2017) Study of lightweight precast concrete using polystyrene.

[22]. Kourosh Kabiri, Super Absorbant Polymer, Iran (June,2008).

[23]. Lakshmi Kumar, Minapu, et al (Dec 2014) Study on Light Weight Aggregate Concrete with Pumice Stone, Silica Fume and Fly Ash as a Partial Replacement of Coarse Aggregate.

[24]. M. Indumathi,P. Selvaprasanth, S. Mathan Kumar, and (Feb 2019) "Development of Light Weight Concrete Using Pumice Stone"International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056, Volume: 6, Issue: 2.

[25]. M. Maghfouri, Quality control of light wt. aggregate concrete based on initial and final water absorption Test, Iraq (June,2017).

[26]. Sukmin Kwon, Tomoya Nishiwaki, Takatsune Kikuta, Material Design Method for light wt. Cement base & its Applications (June,2017).

Flexural Strengthening of Light Weight Reinforced Concrete Beams by Using Glass Fiber Reinforced Polymer

AKSHAY MAHADEV SHINDE[1], MUSKAN SHAKIL DESAI[2], ABHIJIT SARJERAO DAKAVE[3], PROF. A. C. THOKE[4]

[1, 2, 3] *Final Year B.Tech Student, Department of Civil Engineering, SETI, Panhala, Kolhapur, India*

[4] *Assistant Professor, Department of Civil Engineering, SETI, Panhala, Kolhapur, India*

Abstract- ***The use of Lightweight concretes has gained acceptance and popularity worldwide in the recent years in the construction and development of both the infrastructure and residential buildings. Light weight aggregate concrete has become more popular in recent advancements owing to the tremendous advantages it offers over the conventional concrete but at the same time light in weight and strong enough to be used for structural purposes. Replacement of natural aggregate with concrete such as light weight concrete by using sintered fly ash aggregate (natural aggregate), The main disadvantage of conventional concrete it is high self -weight. This heavy self-weight will make it to some extent an uneconomical structural material. Light weight concrete having low density facilitates reduction of dead load and to increase thermal insulation.***

I. INTRODUCTION

- DATA ANALYSIS (MATERIAL USED)

A. Cement

Ordinary Portland Cement Birla Shakti (M43 Grade) confirming to IS 269-1976 was used throughout the investigation. Different test was performed on the cement to ensure that it confirms to the requirement of the IS specification. The physical properties of the cement were determined as per IS 4031-1968 and are presented in the following table 1.

TABLE 1
Physical analysis of Birla Shakti (M43 Grade) Cement

Sr. No	Properties	Value	Requirements of IS:8112 1989
1	Specific Gravity	3.15	-
2	Standard Consistency	31%	-
3	Initial Setting Time	104 min	Min 30 min
4	Final Setting Time	205 min	Max 600 min
5	Soundness	3.5	Less than 10%
6	Fineness	5.5	Less than 10%
7	Compressive strength (N/mm^2)		
	3 Days	28.35	Not less than 22 N/mm^2
	7 Days	35.48	Not less than 33 N/mm^2
	28 Days	52.68	Not less than 43 N/mm^2

B. Sand

TABLE 2
Properties of Fine Aggregate

Sr. No.	Properties	Value
1	Specific Gravity	2.72
2	Fineness modulus	3.342
3	Silt content	4%
4	Water absorption (after 24hr)	2.6%

C. Sintered Fly Ash Aggregate

TABLE 3
Properties of sintered fly ash Aggregate

Sr. No.	Properties	Value
1	Specific Gravity	1.50
2	Fineness modulus	6.24
3	Water Absorption (after 24hr)	14.20%

D. Admixtures

Admixture Used for Project: - Algisuperplast N

E. Water:

Water is an important ingredient to make concrete. The purpose of adding water to concrete is, to distribute the cement evenly, react with cement chemically to produce calcium silicate hydrate gel and provide workable one. Small amount of water is needed to hydrate cement. Additional water is required to lubricate the mix. Excess water leads to bleeding stage ultimately creation of pores. Quantity of water is controlled by the w/c ratio. The water used must be free from oil, acid and alkali, salts and organic material. It should be potable.

II. M20 GRADE CONCRETE MIX DESIGN

M20 Grade Concrete mix design was done by using trial and error method with 100% Replacement of Natural Aggregate by Sintered Fly Ash Aggregate)

TABLE 4
FINAL MIX PROPORTION USING 100% REPLACEMENT OF NATURAL AGGREGATE BY SINTERED FLY ASH AGGREGATE

Cement	Sand	Sintered Fly Ash Aggregate	Water	Chemical
365	868.727	584.865	175.20	1% of Cement by Weight
1	2.377	1.602	0.48	

TABLE 5
QUANTITY OF INGREDIENT NEEDED FOR CASTING

Items	For 1 Cube	For 1 Beam	For 1 Cylinder
Cement (Kg)	1.232	1.825	0.573
Sand (Kg)	2.929	4.339	1.362
Coarse Aggregate (Kg)	0.000	0.000	0.000
Sintered Fly Ash Aggregate (kg)	1.974	2.924	0.918
Water (Kg)	0.591	0.876	0.275
Chemical (gm.)	12.32	18.250	5.730

III. STRENGTHENING OF BEAMS

Before bonding the composite fabric on to the concrete surface, the required region of concrete surface was made rough using a coarse sand paper texture and cleaned with an air blower to remove all dirt and debris. Once the surface was prepared to the required standard, the polyester resin was mixed in accordance with manufacturer's instructions. Mixing was carried out in a plastic container (Accelerator Cobalt 3% (Intense blue liquid) and Hardener 1.5%) and continued until the mixture in uniform colour. When this was completed and the fabrics had been cut to size, the resin mixture was applied to the concrete surface. The composite fabric was then placed on top of polyester resin coating and the resin was squeezed through the roving of the fabric with the roller. Air bubbles entrapped at the epoxy/concrete or epoxy/fabric interface were to be eliminated. Then the second layer of the resin was applied and GFRP sheet was then placed on top of resin coating and the resin was squeezed through the roving of the fabric with the roller and the above process was repeated. During hardening of the resin, a constant uniform pressure was applied on the composite fabric surface in order to extrude the excess resin and to ensure good contact between the resin, the concrete and the fabric. This operation was carried out at room temperature. Concrete beams strengthened with glass fiber fabric were cured for 24 hours at room temperature before testing.

The experimental work consists of casting of four sets of reinforced concrete (RC) beams having grade M20, cross-sectional dimensions of 100mm x 200mm and 1100mm length. We provided 2-10mm Ø bottom reinforcement and 2-10mm Ø top with 6mm Ø vertical stirrups @ 300 mm c/c. The strengthening of the beams using GFRP sheet is done on bottom side wrap with three different length configurations namely Central 1/3 length of Testing (300 mm Length), Central 2/3 length of Testing (600 mm Length) & Full length of Testing (900 mm Length).

The experimental study consists of casting of four sets of reinforced concrete (RC) beams of grade M20, with 100% Replacement of Natural Aggregate with Sintered Fly Ash Aggregate. Total 12 no. of RC beam are cast and curing for 28 days.

1. First set of (3 no.) Light Weight RC beams designated as control beams (SET I).
2. Second set of (3 no.) Light Weight RC beams (SET II); all are strengthened using single GFRP mat wrap, (for Central 1/3 length of Testing [300 mm]).
3. Third set of (3 no.) Light Weight RC beams (SET III); all are strengthened using single GFRP mat wrap, (for Central 2/3 length of Testing [600 mm]).
4. Fourth set of (3 no.) Light Weight RC beams (SET III); all are strengthened using single GFRP mat wrap, (for Full length of Testing [900 mm]).

IV. TESTING SETUP

All the specimens are tested in Universal testing machine (UTM). The testing procedures for the all specimens are same. After the curing period of 28 days is over, control beams (SET I) are washed and its surface is cleaned for clear visibility of cracks. Where other set of Light Weight RC beams (SET II, SET III, SET IV) are strengthened by GFRP sheets. The load arrangements for testing of all sets of beam is consist of two-point loading as shown in Figure 1A and 1B.,

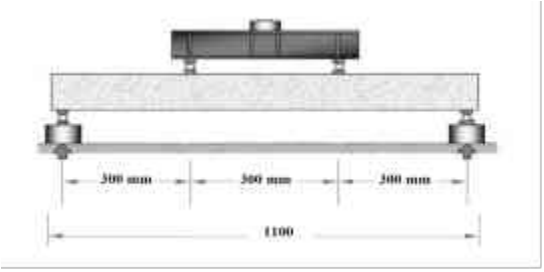


Figure 1 B: Experimental setup for testing of beams

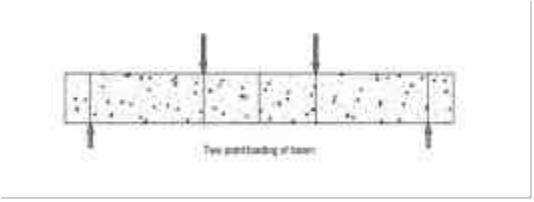


Figure 1 B: Experimental setup for testing of beams

A. Testing procedure

All the specimens were tested in the loading frame .The testing procedure for the entire specimen was same. After the curing period of 28 days was over, the beam as washed and its surface was cleaned for clear visibility of cracks. The most commonly used load arrangement for testing of beams will consist of two-point loading. This has the advantage of a substantial region of nearly uniform moment coupled with very small shears, enabling the bending capacity of the central portion to be assessed.

V. RESULTS ANALYSIS WITH RESPECT TO DEFLECTION

A. Introduction

This chapter describes the experimental results of all SETS beam (SET I, SET II, SET III, SET IV). Their behavior throughout the static test to failure is described using recorded data on deflection behavior, and the ultimate load carrying capacity. The mid-span deflection of each beam was compared with that of their respective control beams(as a practical deflection) and actual theoretical deflection . Also the load-deflection behavior was compared between three wrapping schemes having the same reinforcement (Central 1/3 length of Testing, Central 2/3 length of Testing and Full length of Testing). The mid-span deflections were much lower when bonded externally with GFRP sheets.

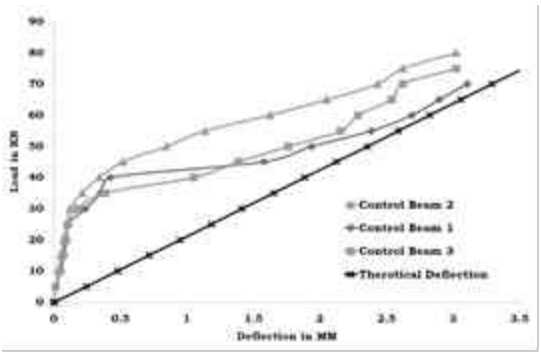
B. Load Deflection History

The two point static loading is applied on the beams and at the each increment of the load (1KN/sec). Deflections at the middle in beams are noted down and load Vs deflection curve of all the sets of beams is plotted. The Load- deflection of each strengthened beam is compared with that of their respective control beams (as a practical deflection) and actual theoretical deflection.

C. Load vs Deflection Results of Light Weight RC beams designated as control RC beams (SET I)

TABLE 6
LOAD VS DEFLECTION RESULTS OF CONTROL RC BEAMS (SET I)

Load In KN	Deflection in MM			
	Theoretical	Control Beam 1	Control Beam 2	Control Beam 3
0	0	0	0	0
5	0.243	0.014	0.0124	0.0132
10	0.478	0.053	0.035	0.044
15	0.712	0.076	0.053	0.0645
20	0.947	0.096	0.0721	0.08405
25	1.182	0.108	0.0984	0.1032
30	1.412	0.235	0.12	0.1775
35	1.651	0.351	0.212	0.383
40	1.885	0.425	0.341	1.049
45	2.12	1.578	0.52	1.39
50	2.355	1.935	0.845	1.76
55	2.589	2.385	1.135	2.1555
60	2.824	2.687	1.624	2.284
65	3.058	2.894	2.05	2.538
70	3.293	3.105	2.432	2.621
75	3.527		2.621	3.021
80	3.762		3.021	

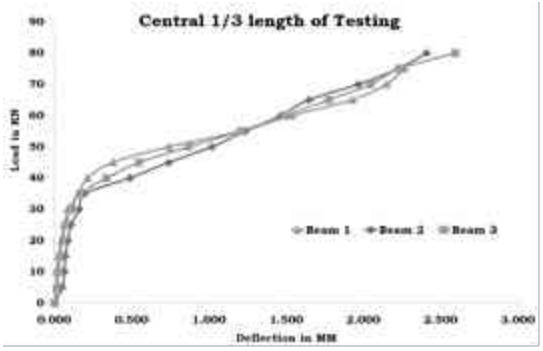


Graph 1 Load vs Deflection Results of control RC beams (SET I)

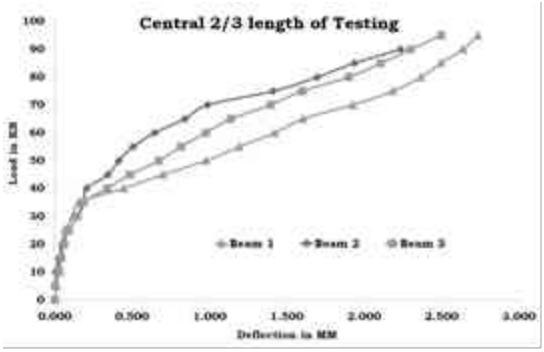
D. Load vs Deflection Results of Light Weight RC beams (SET II); all are strengthened using single GFRP wrap for Central 1/3 length of Testing (Length = 300mm).

TABLE 7
LOAD VS DEFLECTION RESULTS OF LIGHT WEIGHT RC BEAMS (SET II) (GFRP WRAP LENGTH = 300MM)

Load In KN	GFRP Wrap for Central 1/3 length of Testing		
	Beam 1	Beam 2	Beam 3
0	0.000	0.000	0.000
5	0.012	0.051	0.019
10	0.014	0.065	0.027
15	0.027	0.070	0.036
20	0.046	0.087	0.054
25	0.064	0.107	0.073
30	0.089	0.160	0.112
35	0.157	0.196	0.164
40	0.213	0.488	0.338
45	0.379	0.740	0.547
50	0.742	1.019	0.868
55	1.201	1.235	1.205
60	1.539	1.462	1.488
65	1.926	1.646	1.773
70	2.148	1.965	2.044
75	2.264	2.226	2.233
80		2.407	2.591



Graph 2 Load vs Deflection Results of Light Weight RC beams (SET II)(GFRP Wrap for Central 1/3 length of Testing, i.e.Wrap Length = 300mm)



Graph 3 Load vs Deflection Results of RC beams (SET II) (GFRP Wrap for Central 2/3 length of Testing, i.e.Wrap Length = 600mm)

E. Load vs Deflection Results of Light Weight RC beams (SET III); all are strengthened using single GFRP wrap for Central 2/3 length of Testing (Length = 600mm).

F. Load vs Deflection Results of Light Weight RC beams (SET IV); all are strengthened using single GFRP wrap for Full length of Testing (Length = 900mm).

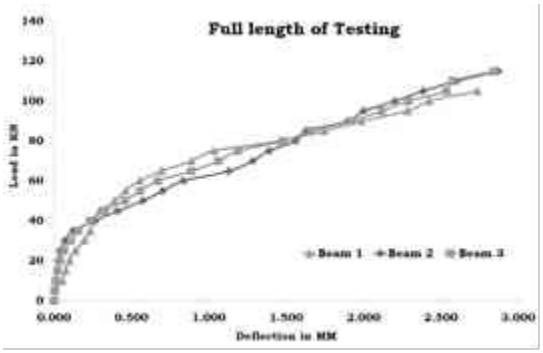
TABLE 8
Load vs Deflection Results of Light Weight RC beams (SET III)(GFRP Wrap Length = 600mm)

Load In KN	GFRP Wrap for Central 1/3 length of Testing		
	Beam 1	Beam 2	Beam 3
0	0.000	0.000	0.000
5	0.010	0.000	0.001
10	0.024	0.006	0.028
15	0.029	0.027	0.040
20	0.046	0.050	0.060
25	0.066	0.090	0.090
30	0.118	0.147	0.145
35	0.155	0.187	0.183
40	0.447	0.206	0.339
45	0.698	0.343	0.484
50	0.978	0.414	0.673
55	1.194	0.506	0.816
60	1.421	0.646	0.976
65	1.605	0.840	1.138
70	1.924	0.987	1.394
75	2.185	1.411	1.598
80	2.366	1.698	1.901
85	2.496	1.937	2.109
90	2.638	2.236	2.300
95	2.735		2.498

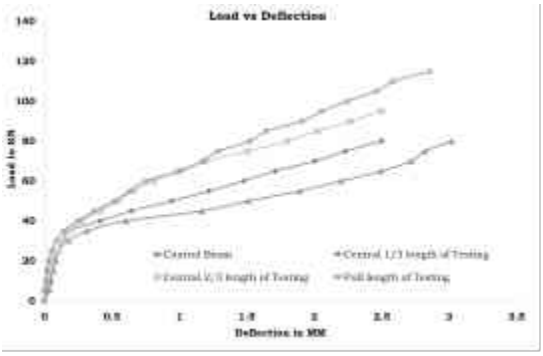
TABLE 9
LOAD VS DEFLECTION RESULTS OF LIGHT WEIGHT RC BEAMS (SET IV) (GFRP WRAP LENGTH = 900MM)

Load In KN	GFRP Wrap for Central 1/3 length of Testing		
	Beam 1	Beam 2	Beam 3
0	0.000	0.000	0.000
5	0.010	0.006	0.001
10	0.055	0.015	0.010
15	0.075	0.018	0.022
20	0.098	0.028	0.038
25	0.138	0.039	0.064
30	0.195	0.070	0.108
35	0.235	0.125	0.155
40	0.254	0.263	0.234
45	0.294	0.411	0.328
50	0.391	0.575	0.458
55	0.462	0.701	0.557
60	0.554	0.835	0.670
65	0.694	1.130	0.887
70	0.888	1.283	1.061
75	1.035	1.390	1.188
80	1.459	1.560	1.485
85	1.746	1.626	1.661
90	1.985	1.898	1.917
95	2.284	1.998	2.116

Load In KN	GFRP Wrap for Central 1/3 length of Testing		
	Beam 1	Beam 2	Beam 3
100	2.425	2.201	2.288
105	2.735	2.385	2.535
110		2.600	2.575
115		2.870	2.845



Graph 4 Load vs Deflection Results of Light Weight RC beams (SET II) (GFRP Wrap for full length of Testing, i.e.Wrap Length = 900mm)



Graph 5 Load vs Deflection Results of Light Weight RC beams (All SETS)

VI. DISCUSSION ON DEFLECTION

It is observed from Graph 8.15, Graph 8.19, Graph 8.23, that the deflection of beams (SET II, III and IV) when bonded with GFRP sheets with bottom side wrap is lesser than the control beams (SET I).

With reference to graph 5,

1. Maximum deflection of Control Beam (SET I) is 3.02 mm @ Load 80 KN
2. Maximum deflection of SET II is 2.499 mm @ Load 80 KN
3. Maximum deflection of SET III is 2.49 mm @ Load 95 KN
4. Maximum deflection of SET IV is 2.80 mm @ Load 115 KN

With reference to Tables and Graphs it is observed that for load of 80 KN the deflection of Light Weight Light Weight RC Beams designated as control Light Weight RC Beams (SET I) is 3.021 mm similarly for the same load the deflection of Light Weight RC Beams strengthened using single GFRP mat wrap for Central 1/3 length of Testing [300 mm] (SET II) is 2.4993 mm, Light Weight RC Beams strengthened using single GFRP mat wrap for Central 2/3 length of Testing [600 mm] (SET III) is 1.7991 mm and Light Weight RC Beams strengthened using single GFRP mat wrap for Full length of Testing [900 mm] (SET IV) is 1.5226 mm.

CONCLUSION

Successfully achieved reduction in deflection for Strengthening of Light Weight RC Beams with GFRP warp for Full length of Testing (i.e. 900mm length) by 40.44 %.

REFERENCES

[1] AbdulKadir Ismail Al-hadithi, Self Compacting Light Wt concrete containing ponzo. Aggregate, University of Anbar, Iraq (Jan-2019).

[2] AFAF Mo.wedatalla, Abubaker A.M Ahmed, Effect of curing and Period of Curing on Concrete,(Sep, 2018).

[3] Ahsan Ali, Shahid Iqabab, Thomas Bier, Yuri Ribakov, Study on structure of concrete, Germany,(March,2016).

[4] Amalu R.G, Azeef Ashraf, Muhammat Hussain, Use of waste plastic as fine aggregate substitute in concrete, UKF COE,India, (April,2016).

[5] Amir Hossein Niknamfar, Generating structural Light wt. Concrete, AIISE, USA (Nov,2017).

[6] A.R. Pourkhorshidi,M. Najimi, T. Parhizkar (July 2012), “Application of Pumice Aggregate in Structural Lightweight Concrete”Asian Journal of Civil Engineering (Building and Housing) Vol. 13, No. 1, Issue 1.

[7] Anil Godara, Anurag Maheswari, Ashish Kumar Meena, Rakesh Kumar Saini (May 2018), "Experimental study on light weight concrete with pumice stone as a partial replacement of coarse aggregate", ISSN: 2277-2723, Volume 7, Issue 5.

[8] B. Devi Pravallika, K. Venkateswara Rao (2015), "The study on strength properties of light weight concrete using light weight aggregate" International Journal of Science andResearch(IJSR) ISSN: 2319-7064, Volume 5, Issue 6.

[9] B. Jose Ravindra Raj, V. Ravikumar (April 2017), "Experimental behaviour of light weight aggregate and mineral admixtures based light weight concrete", International Journal of Emerging Technologies in Engineering Research (IJETER) ISSN: 2454-6410, Volume 5, Issue 4.

[10] Chrdsaqusiri Pattanponga, Properties of cellular light wt. concrete using calcium bottom ash, Portland cement,geopolymer mortar (January,2020).

[11] Davoud Tavakoli, Use of Waste material in Concrete, Iran (April,2018).

[12] Dr. K Rajeskhar, M Praveen Kumar, (Sept 2016)Light weight concrete by partial replacement of coarse aggregate by pumice stone and cement by GGBS using M30 grade of concrete.

[13] Dr.Sunila George, Rajeshwari S, (2015), "Experimental study of light weight concrete by partial replacement of coarse aggregate using pumice aggregate", International Journal of Scientific Engineering and Research (IJSER) ISSN: 2347-3878, Volume 4, Issue 5.

[14] Dr. U. Rangaraju, Lakshmi Kumar Minapu, M K M V Ratnam, (Dec 2014), "Experimental study on light weight aggregate concrete with pumice stone, silica fume and fly ash as a partial replacement of coarse aggregate" International Journal of Innovative Research in Science, Engineering and Technology ISSN: 2319-8753, Volume 3, Issue 12.

[15] G. Gunasekaran, Light wt. Concrete by using Cocunut shell as Aggregates, SRM University,India (Feb,2008).

[16] HirzoMihashi TomoyaNishiwaki, Development of Engineered self healing & self Repairing concrete, Hirzostate of Art-Report (April,2012).

[17] Issac Ibukan Akinwumi, Curing effect on Properties of high strength Concrete, Convenant University (June, 2014).

[18] Jose Barrose De Aguiar, Habib Trouzine, Malika Medine, Structural light wt. concrete properties, USA (August,2017).

[19] K. Mahendra ,K. Venkataramana, L. Hari Krishna ,M.Rajasekhar, S. Prashanth "Experimental Investigation On Structural Lightweight Concrete By Partial Replacement Of Coarse Aggregate Using Pumice Aggregate"International Journal of Engineering Applied Sciences and Technology, 2020 Vol. 4, Issue 11, ISSN No. 2455-2143, Pages 429-433.

[20] Khashayar Jafari Mostafa, Vahab, Study of Behaviour of Concrete under Axial & Triaxial load, USA (August,2017).

[21] Kothari Akash and Chaudhari Balasaheb(April 2017) Study of lightweight precast concrete using polystyrene.

[22] Kourosh Kabiri, Super Absorbant Polymer, Iran (June,2008).

[23] Lakshmi Kumar, Minapu, et al (Dec 2014) Study on Light Weight Aggregate Concrete with Pumice Stone, Silica Fume and Fly Ash as a Partial Replacement of Coarse Aggregate.

[24] M. Indumathi,P. Selvaprasanth, S. Mathan Kumar, and (Feb 2019) "Development of Light Weight Concrete Using Pumice Stone"International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056, Volume: 6, Issue: 2.

[25] M. Maghfouri, Quality control of light wt. aggregate concrete based on initial and final water absorption Test, Iraq (June,2017).

[26] Sukmin Kwon, Tomoya Nishiwaki, Takatsune Kikuta, Material Design Method for light wt. Cement base & its Applications (June,2017).