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IoT Based Health Monitoring System

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ABSTRACT: Wireless communication technologies are one at the biggest contribution to mankind. It is enhanced to convey the information quickly to the consumers. In the modern health care environment, the usage of internet of things (IoT) with global system for mobile communication (GSM) brings convenience of physicians and patients. The body sensor networks are one of the core technologies of IoT developments in health care system. IoT and GSM based monitoring system is proposed for continuous monitoring of patients health condition using sensors. Doctor can monitor the patient condition on smart phone. In existing system all the sensors data will be stored send send to the doctor using Zigbee. A Wireless Sensor Network (WSN) for monitoring patient's physiological conditions continuously using Zigbee. Here the physiological conditions of the patient's are monitored by sensors and the output of these sensors is transmitted via Zigbee and the same has to be sent to the remote wireless monitor for acquiring the observed patient's physiological signal Infusion pump is a medical device. It is healthcare facilities used worldwide in hospitals, and at home.

KEYWORDS: Arduino, JAVA, IoT, data acquisition unit, mobile application etc.

I.INTRODUCTION

The increased use of mobile technologies and smart devices in the area of health has caused great impact on the world. Health experts are increasingly taking advantage of the benefits these technologies bring, thus generating a significant improvement in health care in clinical settings. According to the constitutions of World Health Organization (WHO) the highest attainable standard of health is a fundamental right for an individual. As we are truly inspired by this, we attempt to propose an innovative system that puts forward a smart patient health tracking system that uses sensors to track patient vital parameters and uses internet to update the doctors so that they can help in case of any issues at the earliest preventing death rates. Patient Health monitoring using IoT is a technology to enable monitoring of patients outside of conventional clinical settings (e.g. in the home), which may increase access to care and decrease healthcare delivery costs. This can significantly improve an individual's quality of life. It allows patients to maintain independence, prevent complications, and minimize personal costs. This system facilitates these goals by delivering care right to the home.

In addition, patients and their family members feel comfort knowing that they are being monitored and will be supported if a problem arises. The IoT technology uses internet to transfer the medical data about the patient continuously .Body Sensor Network (BSN) allows the integration of intelligent, miniaturized low-power sensor nodes in, on or around human body to monitor body functions and the surrounding environment. It has great potential to revolutionize the future of healthcare technology and attained a number of researchers both from the academia and industry in the past few years. Generally, BSN consists of in-body and on-body sensor networks.[3] An in-body sensor network allows communication between invasive/implanted devices and base station. On the

other hand, an on-body sensor net work allows communication between non-invasive/wearable devices and a coordinator. Now, our BSN-Care BSN architecture composed of wearable and implantable sensors. [5] Each sensor node is integrated with bio-sensors such as Electrocardiogram (ECG), Blood Pressure (BP), etc. These sensors collect the physiological parameters and forward them to a coordinator called Local Processing Unit (LPU), which can be a portable device such as PDA, smart-phone etc.
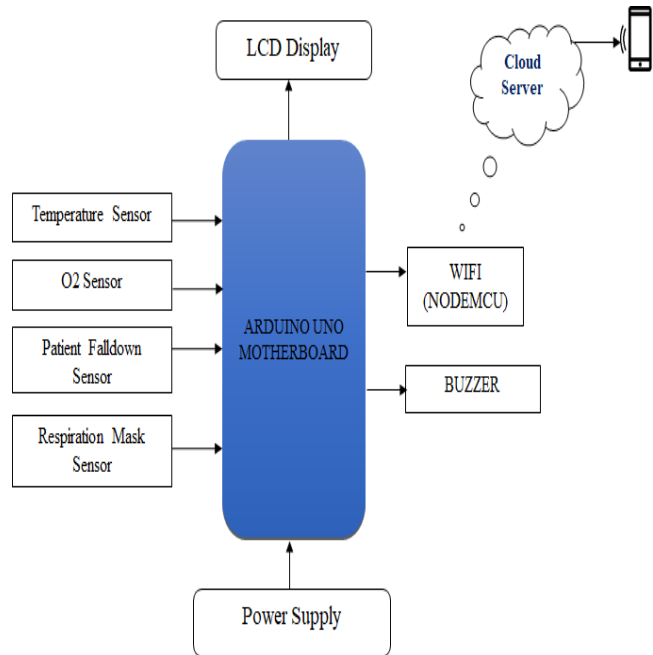
II.PROPOSED SYSTEM

Fig: 1 Block Diagram Remote Health Monitoring

It is possible to monitor the vital signs of patients remotely using a wireless health monitoring system or patient monitoring system. As a result of the use of telecommunication devices in healthcare, doctors are able to monitor multiple patients at the same time with ease. So they can keep an eye on patients virtually, whether in the hospital or at home. Heart rate, body temperature, respiratory rate, non-invasive blood pressure, and oxygen saturation are just a few of the vital signs monitored by the devices. Due to the widespread use of wireless health monitoring, geographic obstacles to expert treatment have been removed.

The IoT technology monitors the patients health and log the data in a cloud storage .Whenever the patient need emergency care, the proposed system alerts the predefined users and also it finds the nearby emergency contacts like ambulance. The IoT technology uses internet to transfer the medical data about the patient continuously .Body Sensor Network (BSN) allows the integration of intelligent, miniaturized low-power sensor nodes in, on or around human body to monitor body functions and the surrounding environment. It has great potential to revolutionize the future of healthcare technology and attained a number of researchers both from the academia and industry in the past few years. Generally, BSN consists of in-body and on-body sensor networks. An in-body sensor network allows communication between invasive/implanted devices and base station. On the other hand, an on-body sensor net work allows communication between non-invasive/wearable devices and a coordinator. Now, our BSN-Care BSN architecture composed of wearable and implantable sensors. Each sensor node is integrated with bio-sensors such as Electrocardiogram (ECG), Blood Pressure (BP), etc. These sensors collect the physiological parameters and forward

them to a coordinator called Local Processing Unit (LPU), which can be a portable device such as PDA, smart-phone etc. The LPU works as a router between the BSN nodes and the central server called BSN-Care server, using the wireless communication mediums such as mobile networks 3G/CDMA/GPRS. Besides, when the LPU detects any abnormalities then it provides immediate alert to the person that wearing the bio-sensors.
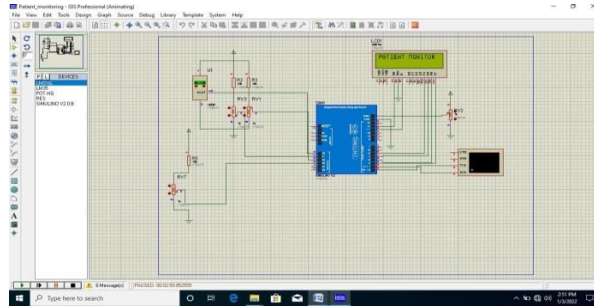
III.SIMULATION PROTOTYPE

Fig: 2 Simulation Result

Proteusis software for microprocessor simulation, schematic capture, and printed circuit board (PCB) design. The Proteus Professional demonstration is intended for prospective customers who wish to evaluate professional level products. It differs from Proteus Lite in that it does not allow you to save, print or design your own microcontroller based designs you can however write your own software programs to run on the existing sample. The package is a system of circuit simulation, based on model Of electronic component sin P Spice. Also present in the assembly of portable version. Temperature sensor is used to measure temperature with an electrical output proportional to the temperature.
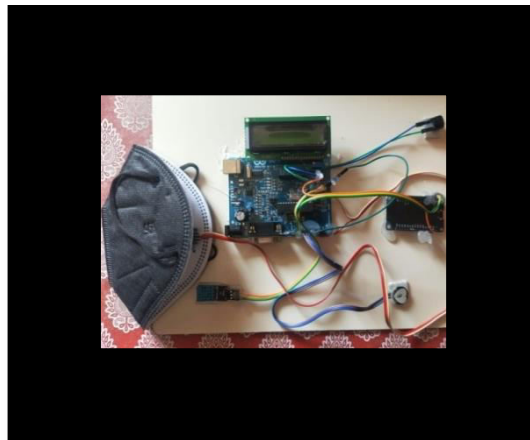
IV.HARDWAER IMPLEMENTATION

Fig: 3 Hardware Implementation

The Arduino Uno R3 is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply

connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. A heart rate monitor is a personal monitoring device which allows one to measure his heart rate in real time or record the heart rate for later study. It is largely used by performers of various types of physical exercise.

Temperature sensors are vital to a variety of everyday products. For example, household ovens, refrigerators, and thermostats all rely on temperature maintenance and control in order to function properly. Temperature control also has applications in chemical engineering. Examples of this include maintaining the temperature of a chemical reactor at the ideal set-point, monitoring the temperature of a possible runaway reaction to ensure the safety of employees, and maintaining the temperature of streams released to the environment to minimize harmful environmental impact. A pressure sensor is a device which senses pressure and converts it into an analog electric signal whose magnitude depends upon the pressure applied. Since they convert pressure into an electrical signal, they are also termed as pressure transducers.

To address Industrial Internet of Things (IoT) projects, Ethernet connectivity becomes the most reliable and stable technology. The IoT Ethernet Kit powered by AWS IoT uses an Ethernet LAN8740A driven by a 32-bit microcontroller with 2 MB of Flash (PIC32MZ EF) that provides plenty of memory space for your application. On the sensor side, hundreds of different sensors can be plugged into the Micro Electron kamikro BUS™ footprint allowing for prototyping a large variety of IoT proof-of-concepts. This IoT kit takes advantage of the AWS IoT service and provide a smooth user experience coming preloaded with the corresponding firmware. AWS IoT is a managed cloud platform that allows connected devices to interact easily and securely with cloud applications and other devices. Additionally, the firmware in the kit makes use of MPLAB® Harmony, Free RTOS™, Wolf MQTT and Wolf SSL allowing you to quick-start your IoT design.

A liquid crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

V.CONCLUSION

We found that even though most of the popular BSN based research projects acknowledge the issue of the security, but they fail to embed strong security services that could be preserve patient privacy. Finally, we proposed a secure IoT based healthcare system using BSN, called BSN-Care, which Can efficiently accomplish various security requirements of the BSN Based healthcare system .All the sensor which is connected in the body is used to collect the upnormal symptoms of the human body and then it is collected back to the doctors through the IoT technology.

REFERENCES

1. R.Weinstein,"RFID:A technical over view and its application to the enter prise , "IEEEIT Prof.,vol.7,no.3,pp.27–33,May/Jun.2005.
2. P.Gope, T. Hwang, "Untraceable Sensor Movement in Distributed IoT Infrastructure, "IEEE Sensors Journal,Vol.15 (9),pp.5340 –5348,2015.
3. P.Gope, T.Hwang, "A Realistic Lightweight Authentication Protocol Preserving Strong Anonymity for Securing RFID System,"Computers & Security (Elsevier Journal), Vol.55,pp.271–280,2015.
4. S.D.T. Kelly, N.K. Suryadevara, S.C. Mukhopadhyay, "Towards the Implementation of IoT for Environmental Condition Monitoring in Homes", IEEE, Vol. 13, pp. 3846-3853, 2013
5. Rajeev Piyare "Internet of Things: Ubiquitous Home Control and Monitoring System using Android based Smart Phone" International Journal of Internet of Things 2013, 2(1): 5-11
6. R. Piyare and M. Tazil, "Bluetooth based home automation system using cell phone," in Consumer
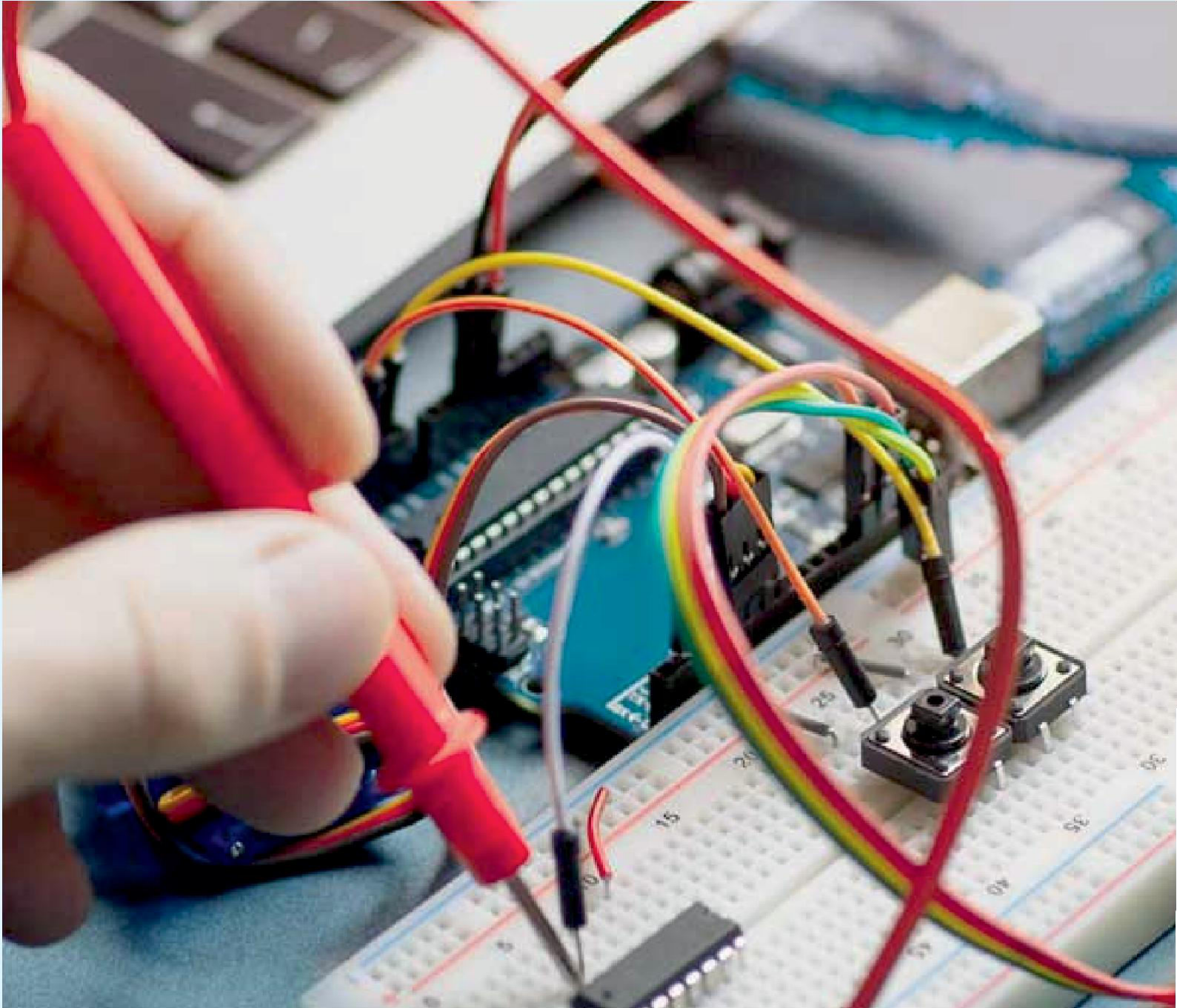
Electronics (ISCE), 2011 IEEE 15th International Symposium on, 2011, pp. 192-195.

7. S.Umamaheswari, M.Thilagavathi, S.Sivaranjani, N.Mohananthini, M.Selvakumari, S.Saravanan," A Study Of Renewable Energy In Smart Grid Technology", International Journal of Engineering Technology Research & Management, Vol.05, Issue.09, Pp.94-101, 2021.

8. D.Ajithkumar, J.S.Akilan, K.Dileep, R.Lokesh, E.Viswanathan S.Tamilselvan S.Saravanan," Design and Development of Electric Two Wheeler With Fast Charging", International Journal of Engineering Technology Research & Management, Vol.05, Issue.09, Pp.94-101, 2021.

9. V.Annamalai P.S.Isaiyalagan T.Manikandan T.Premkumar N.Sathya R.Prakash S.Saravanan," Design and Implementation of Automatic Rope Robot for Supplying Poultry Feeds", International Journal of Engineering Technology Research & Management, Vol.05, Issue.09, Pp.94-101, 2021.

10. S.Arvinthraj, M.Arun, S.Inbhakumar, R.Sagayaraj, S.Saravanan," Multipurpose Hybrid Electric Vehicle for Agricultural Applications", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.10, Issue.10, Pp.7366-7371, 2021.

11. G.Boopathi raja, K.Dhinesh, S.Gobi, G.Nandakumar, G.Nagarajan, G.Vijayakumar, S.Saravanan," Cotton Harvesting Machine", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.10, Issue.10, Pp.7372-7377, 2021

12. S.Anbarasu, K.Hariharan, S.Hariharan, R.Vinoth, T.Divya, N.Mohananthini, S.Saravanan," Battery Monitoring for E-Scooter Using Internet of Things", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.10, Issue.10, Pp.7384-7389, 2021

13. S.Mangalraj, L.Manimaran, C.Kumaresan, R.Manikandan, G.Srinivasan, A.Gokulraj, S.Saravanan," IoT Based Smart Energy Meter", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.10, Issue.10, Pp.7390-7395, 2021

14. M.Dhanarasan, T.Jothimurali, S.U.Manishkumar,, G.Dineshkumar,P.Sakthilakkia, A.Senthilkumar, S.Saravanan," Gas Booking Using IoT", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.10, Issue.10, Pp.7396-7400, 2021

15. D.Manoj kumar, C.Kavinkumar, S.Kesavan, S.Saranraj, M.Selvakumari, P.Dhivyabharathi, S.Saravanan," Intelligent Water Level Management for Domestic Application Using GSM", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.10, Issue.10, Pp.7401-7404, 2021

16. Jaladi Kishan Kanna, S.Muniyappan, A.Ajay, M.Swathisriranjani, N.Balaji , K.Prakasam , S.Saravanan ," IOT Based Multi Functional Robot", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.10, Issue.10, Pp.7405-7413, 2021

17. G.Naveen, S.Guna, P.Praveen Kumar, P.Manikandan, S.Sandhiya, M.Dineshkumar, S.Saravanan ," Smart Agriculture Using IoT", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.10, Issue.10, Pp.7414-7419, 2021

18. K.Karan, M.Nirmal Kumar, S. Pugalenthi, R.Suresh V.Deepika, Dr.S.Saravanan ," Design and Development of E-Vehicle Based on Roller", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.10, Issue.10, Pp.7420-7426, 2021

19. S.Priyadharshini, D.Sivaranjani, S.Sowbaranika, S.Saravanan, N.Mohananthini," Automatic Solar Panel Tracker Using Artificial Intelligence and Data Science", International Journal of Innovative Research in Science, Engineering and Technology, Vol.10, Issue.10, Pp.13729-13735, 2021

20. S.Ashok, R.Mohanraj, K.Nandhini, P.Prakash, S.Saranraj, M.Swathisriranjani, N.Mohananthini, S.Saravanan," Solar Powered Highway Dust Cleaner", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.10, Issue.10, Pp.7427-7426, 2021

21. S.Tirumal, T.Suresh, S.Vignesh Kumar, R.Sagayaraj, S.Saravanan," A Novel Pesticide Spraying for Agriculture Crops Using Drones", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.10, Issue.10, Pp.13797-13801, 2021

22. V.Dhinesh, T.Premkumar, S.Saravanan and G.Vijayakumar," Online Grid Integrated Photovoltaic System with New Level Inverter System" International Research Journal of Engineering and Technology (IRJET), Vol.5, Issue 12, pp.1544-1547, 2018

23. J.Vinoth, T.Muthukumar, M.Murugagndam and S.Saravanan," Efficiency Improvement of Partially Shaded PV

System, International Journal of Innovative Research in Science, Engineering and Technology, Vol.4, Special issue 6, pp.1502-1510, 2015

24. M.B.Malayandi, Dr.S.Saravanan, Dr. M.Muruganandam, "A Single Phase Bridgeless Boost Converter for Power Factor Correction on Three State Switching Cells", International Journal of Innovative Research in Science, Engineering and Technology, Vol. 4, Special Issue 6, pp. 1560-1566, May 2015.

25. A.Sasipriya, T.Malathi, and S.Saravanan, "Analysis of Peak to Average Power Ratio Reduction Techniques in SFBC OFDM System" IOSR Journal of Electronics and Communication Engineering (IOSR-JECE), Vol. 7, No.5, 2013.

26. P.Ranjitha, V.Dhinesh, M.Muruganandam, S.Saravanan, "Implementation of Soft Switching with Cascaded Transformers to drive the PMDC Motor", International Journal of Innovative Research in Science, Engineering and Technology, Vol. 4, Special Issue 6, pp. 1411-1418, May 2015.

27. C.Sowmiya, N.Mohanandhini, S.Saravanan and M.Ranjitha,"Inverter Power Control Based On DC-Link Voltage Regulation for IPMSM Drives using ANN" International Research Journal of Engineering and Technology (IRJET), Vol.5, Issue 11, pp.1442-1448, 2018.

28. N.Yuvaraj, B.Deepan, M.Muruganandam, S.Saravanan, "STATCOM Based of Adaptive Control Technique to Enhance Voltage Stability on Power Grid", International Journal of Innovative Research in Science, Engineering and Technology, Vol. 4, Special Issue 6, pp. 1454-1461, May 2015.

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