



**International Journal of Advanced Research in
Education and Technology (IJARETY)**

Volume 11, Issue 3, May-June 2024

Impact Factor: 7.394



IOT Based on Washing Machine

K. Arularasu¹, V. Gokul Kannan², J. Kiruba³, G.D. Gowsigan⁴, C. Nithya⁵, S. Saravanan⁶

UG Students, Department of Electrical and Electronics Engineering, Muthayammal Engineering College, Tamil Nadu, India.^{1,2,3,4}

Assistant Professor, Department of Electrical and Electronics Engineering, Muthayammal Engineering College, Tamil Nadu, India.⁵

Professor, Department of Electrical and Electronics Engineering, Muthayammal Engineering College, Tamil Nadu, India⁶

ABSTRACT: This project presents an idea or a concept for home automation using voice recognition. Today, home automation industry is growing widely; this is powered by the need to provide systems which provides support for aged and physically handicapped people, especially people who lives alone. Smart home or home automation can be said as the residential extension of building automation, it also involves the automation and controlling of lightings, ACs, ventilation and security which also includes home appliances such as dryers/washers, ovens or refrigerators/freezers which uses Wi-Fi for monitoring via remote. Home automation must have compliance with all the household standards and ease of use. This project focuses on flexible, cost friendly wireless home automation system which would be based on an Android App. The app will be working with the help of Voice Recognition also Internet of Things. The App would be featuring the process of voice recognition that would be taking commands from user in order to control different home appliances that would be connected via IOT.

I.INTRODUCTION

As the mobile devices are continuously increasing in its popularity and also for its smooth functionality the demand for advanced and responsive mobile applications is increasing day by day in people's daily routine. Web services utilization is the most open and also practical way for providing remote service access or enabling the applications to make them communicate with each other. Busy and most engaged families also individuals with physical limitations are the people who represent an attractive market for home automation including networking. Because of rapid development in internet and internet of things, we all are highly integrated at an uneven scale. Internet of Things often abbreviated as IOT refers to the interconnection of different devices or any appliances through any possible mode. The other idea used in this app is speech recognition. As speech has been one of the best means of communication between all individuals and will always be. The problem of communication with computer led to heavy research on speech recognition before this the communication between user and computer was simple click method which was suitable for a limited process but researchers wanted a more enhanced communication for the betterment of the people and break the small thin barrier between user and computer. This similar method of speech recognition will be used in this app to control the home appliances with the user's voice.

Technology is a never-ending process. To be able to design a product using the current technology that will be beneficial to the lives of others is a huge contribution to the community. This project presents the design and implementation of a low cost but yet flexible and secure cell phone-based home automation system. The design is based on a stand-alone Arduino BT board and the home appliances are connected to the input/ output ports of this board via relays. The communication between the cell phone and the Arduino BT board is wireless. This system is designed to be low cost and scalable allowing variety of devices to be controlled with minimum changes to its core.

Password protection is being used to only allow authorised users from accessing the appliances at home. This project presents a flexible standalone, low-cost smart home system, which is based on the Android app communicating with the micro-web server providing more than the switching functionalities. The Arduino Ethernet is used to eliminate the use of a personal computer (PC) keeping the cost of the overall system to a minimum while voice activation is incorporated for switching functionalities. Devices such as light switches, power plugs, temperature sensors, humidity sensors, current sensors, intrusion detection sensors, smoke/gas sensors and sirens have been 8 integrated in the system to demonstrate the feasibility and effectiveness of the proposed smart home system. The smart home app is tested and it is able successfully perform the smart home operations such as switching functionalities, automatic environmental control and intrusion detection, in the latter case where an email is generated and the siren goes on.

II. EXISTING SYSTEM

Smart home is not a new term for science society however, it is still far more away from people’s vision and audition. The field of homeautomation is growing exponentially as the electronic based technologies are converging day byday. Variety of smart systems have been constructed where the control is through Bluetooth, internet, short message service (SMS) etc. Bluetooth system is one of the best wireless system and also most of the current laptop/notebook, tablets and cellphones have in-built adaptor which results in reducing the cost of system indirectly. As it limits the control to within the range of Bluetooth environment while on the other hand most of the systems are not too possible to be implemented as a cost-friendly solution. Home automation system is a kind of automation systems, which are used specifically for controlling the home appliances and devices mechanically (in some cases remotely) with the help of variety of control systems. The home automation systems are used for controlling the indoor & outdoor lights, heat, ventilation, air conditioning in the house, to lock or open the doors & gates, to control electrical & electronic appliances and so on using various control systems with appropriate sensors.

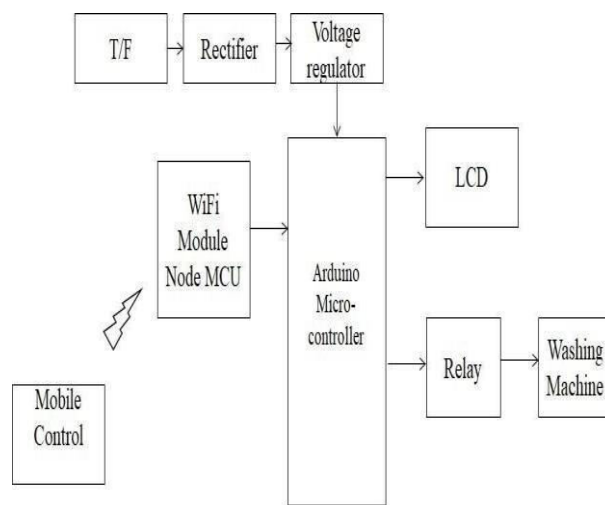


Figure.1. Block Diagram

III. PROPOSED SYSTEM

In this project the Arduino Mega 328 and the Arduino Ethernet shield have been used to implement the smart home micro web-server. Arduino is open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. The Arduino Mega 328 microcontroller board is based on the ATmega328 having 54 digital input/output pins. The Ethernet is interfaced to the Arduino via the Arduino SPI pins. Low voltage switching relays were used to integrate the devices with the Arduino for demonstrating the switching functionality in this proposed project a mobile app is created and it includes all the features of controlling the home appliances with the help of speech recognition and interconnectivity of devices. The mobile app that is created, contains all the commands like switching on/off the, washing machine, Using the smart home app, from a remote location it is possible to control and monitor the smart home environment. The app will communicate with the micro web-server via the internet.

ARDUINO UNO

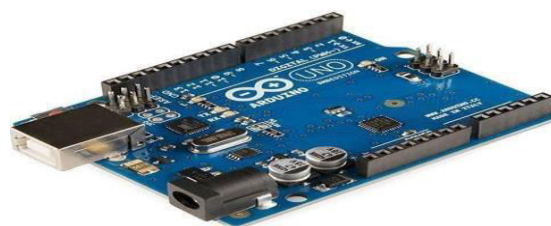


Figure.2. ARDUINO UNO

Arduino Nano controls the other components Raspberry Pi, motors, motor driver module, ultrasonic sensor.

RELAY



Figure.3.Relay

A relay is an electrically operated switch many relays use an electromagnet to mechanically operate a switch.

STEP DOWN TRANSFORMER

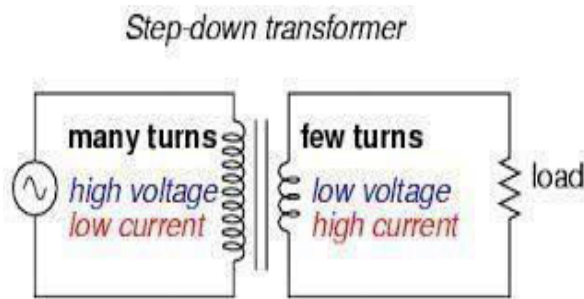


Figure.4.Stepdown Transformer

- Step down transformer is used to step down the voltage to 12 v.
- In step down transformer number of secondary turns is low compare to primary turn.

LCD DISPLAY



Figure.5.LCD Display

- 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.

IV. RESULTS

Proteus PCB design electronic circuits can computer-aided design and circuit boards are designed. The ISIS Intelligent Schematic Input System (Intelligent Switching input system), is the environment for the design and simulation of electronic circuits. The component 45 library includes claims more than 10,000 circuit components with 6000 Prospect Simulations models. Own components can be created and added to the library.

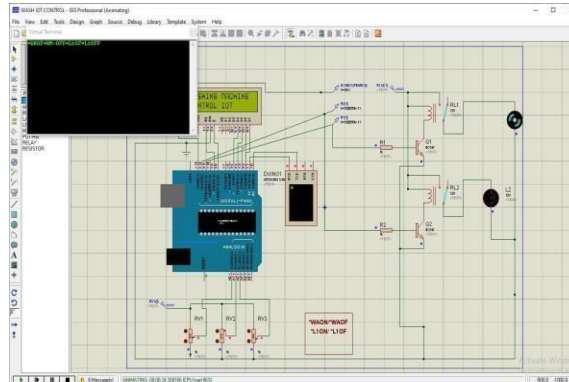


Figure.6.Simulation Results

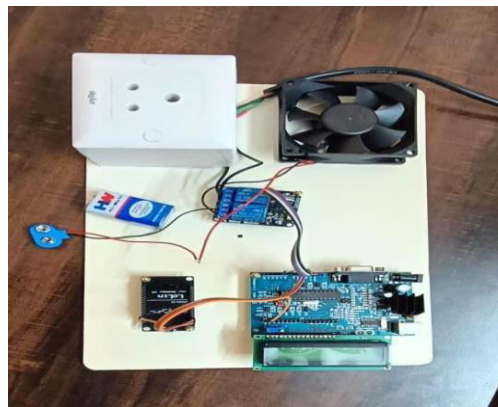


Figure.7. Implementation Model

V.CONCLUSION

In this project, an internet based smart home system that can be controlled remotely upon user authentication is proposed and implemented. The Android based smart home app communicates with the micro web-server via internet using the REST fully based web service. Any android supported device can be used to install the smart home app, and control and monitor the smart home environment. A low-cost smart home system has been developed which does not require a PC as all processing is handled by the microcontroller. The system also uses the Google speech recognition engine thus eliminating the need for an external voice recognition module. Prospective future works include incorporating SMS and call alerts, and reducing the wiring changes for installing the proposed system in pre-existing houses by creating a wireless network within the home environment for controlling and monitoring the smart home environment.

REFERENCES

1. R. Piyare and M. Tazil, "Bluetooth based home automation system using cell phone," in IEEE 15th International Symposium on Consumer Electronics, Singapore, 2011, pp. 192 - 195.
2. S. Kumar, "Ubiquitous Smart Home System Using Android Application," International Journal of Computer Networks & Communications, vol. 6, pp. 33-43, January 2014.
3. R. Piyare, "Ubiquitous Home Control and Monitoring System using Android based Smart Phone," International Journal of Internet of Things, vol. 2, pp. 5-11, 2013.
4. M. S. H. Khiyal, A. Khan, and E. Shehzadi, "SMS Based Wireless Home Appliance Control System (HACS) for Automating Appliances and Security," Issues in Informing Science and Information Technology, vol. 6, pp. 887-894, 2009.
5. R. Piyare and M. Tazil, "Bluetooth based home automation system using cell phone," in IEEE 15th International Symposium on Consumer Electronics, Singapore, 2011, pp. 192 - 195.

6. S. Kumar, "Ubiquitous Smart Home System Using Android Application," International Journal of Computer Networks & Communications, vol. 6, pp. 33-43, January 2014.
7. R. Piyare, "Ubiquitous Home Control and Monitoring System using Android based Smart Phone," International Journal of Internet of Things, vol. 2, pp. 5-11, 2013.
8. 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.
9. J.Vinoth, T.Muthukumar, M.Murugandam 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. P.Manikandan, S.Karthick, S.Saravanan and T.Divya," Role of Solar Powered Automatic Traffic Light Controller for Energy Conservation" International Research Journal of Engineering and Technology (IRJET), Vol.5, Issue 12, pp.989-992, 2018.
16. R.Satheesh Kumar, D. Kanimozhi, S. Saravanan, "An Efficient Control Scheme for Wind Farm Using Back to Back Converter," International Journal of Engineering Research & Technology (IJERT), Vol. 2, No.9, pp.3282-3289, 2013.
17. K.Prakashraj, G.Vijayakumar, S.Saravanan and S.Saranraj, "IoT Based Energy Monitoring and Management System for Smart Home Using Renewable Energy Resources," International Research Journal of Engineering and Technology, Vol.7, Issue 2, pp.1790-1797, 2020.
18. J Mohammed siddi, A. Senthil kumar, S.Saravanan, M. Swathisriranjani, "Hybrid Renewable Energy Sources for Power Quality Improvement with Intelligent Controller," International Research Journal of Engineering and Technology, Vol.7, Issue 2, pp.1782-1789, 2020.
19. S. Raveendar, P.M. Manikandan, S. Saravanan, V. Dhinesh, M. Swathisriranjani, "Flyback Converter Based BLDC Motor Drives for Power Device Applications," International Research Journal of Engineering and Technology, Vol.7, Issue 2, pp.1632-1637, 2020.
20. K. Manikanth, P. Manikandan, V. Dhinesh, Dr. N. Mohananthini, Dr. S. Saravanan, "Optimal Scheduling of Solar Wind Bio-Mass Systems and Evaluating the Demand Response Impacts on Effective Load Carrying Capability," International Research Journal of Engineering and Technology, Vol.7, Issue 2, pp.1632-1637, 2020.
21. T.R. Vignesh, M.Swathisriranjani, R.Sundar, S.Saravanan, T.Thenmozhi," Controller for Charging Electric Vehicles Using Solar Energy", Journal of Engineering Research and Application, vol.10, Issue.01,pp.49-53, 2020.
22. V.Dhinesh, Dr.G.Vijayakumar, Dr.S.Saravanan," A Photovoltaic Modeling module with different Converters for Grid Operations", International Journal of Innovative Research in Technology, vol.6, Issue 8, pp.89-95, 2020.
23. V. Dhinesh, R. Raja, S. Karthick, Dr. S. Saravanan," A Dual Stage Flyback Converter using VC Method", International Research Journal of Engineering and Technology, Vol.7, Issue 1, pp.1057-1062, 2020.
24. G. Poovarasan, S. Susikumar, S. Naveen, N. Mohananthini, S. Saravanan," Study of Poultry Fodder Passing Through Trolley in Feeder Box," International Journal of Engineering Technology Research & Management, vol.4, Issue.1, pp.76-83, 2020.
25. C. Sowmya, N. Mohananthini, S. Saravanan, and A. Senthil kumar," Using artificial intelligence inverter power control which is based on DC link voltage regulation for IPMSM drives with electrolytic capacitor," AIP Conference Proceedings 2207, 050001 (2020); <https://doi.org/10.1063/5.0000390>, Published Online: 28 February 2020.
26. M.Revathi, S.Saravanan, R.Raja, P.Manikandan," A Multiport System for A Battery Storage System Based on

- Modified Converter with MANFIS Algorithm,” International Journal of Engineering Technology Research & Management, vol.4, issue 2, pp.217-222, 2020.
27. D Boopathi, S Saravanan, Kaliannan Jagatheesan, B Anand, “Performance estimation of frequency regulation for a micro-grid power system using PSO-PID controller”, International Journal of Applied Evolutionary Computation (IJAE), Vol.12, Issue.4, pp.36-49, 2021.
 28. V Deepika, S Saravanan, N Mohananthini, G Dineshkumar, S Saranraj, M Swathisriranjan, “Design and Implementation of Battery Management System for Electric Vehicle Charging Station”, Annals of the Romanian Society for Cell Biology, Vol.25, Issue.6, 17769-17774, 2021.
 29. A Senthilkumar, S Saravanan, N Mohananthini, M Pushparaj, “Investigation on Mitigation of Power Quality Problems in Utility and Customer side Using Unified Power Quality Conditioner”, Journal of Electrical Systems, Vol.18, Issue.4, pp.434-445, 2022.
 30. V Kumarakrishnan, G Vijayakumar, D Boopathi, K Jagatheesan, S Saravanan, B Anand,” Frequency regulation of interconnected power generating system using ant colony optimization technique tuned PID controller”, Control and Measurement Applications for Smart Grid: Select Proceedings of SGESC 2021, pp.129-141.
 31. C Nagarajan, B Tharani, S Saravanan, R Prakash,” Performance estimation and control analysis of AC-DC/DC-DC hybrid multi-port intelligent controllers based power flow optimizing using STEM strategy and RPFC technique”, International Journal of Robotics and Control Systems”, Vol.2, Issue.1, pp.124-139, 2022.
 32. G Vijayakumar, M Sujith, S Saravanan, Dipesh B Pardeshi, MA Inayathullaa,” An optimized MPPT method for PV system with fast convergence under rapidly changing of irradiation”, 2022 International Virtual Conference on Power Engineering Computing and Control: Developments in Electric Vehicles and Energy Sector for Sustainable Future (PECCON), pp.1-4.
 33. C Nagarajan, K Umadevi, S Saravanan, M Muruganandam, “Performance Analysis of PSO DFFP Based DC-DC Converter with Non Isolated CI using PV Panel”, International Journal of Robotics and Control Systems’ Vol.2, Issue.2, pp.408-423, 2022.
 34. VM Geetha, S Saravanan, M Swathisriranjan, CS Satheesh, S Saranraj, “Partial Power Processing Based Bidirectional Converter for Electric Vehicle Fast Charging Stations”, Journal of Physics: Conference Series, Vol.2325, Issue.1, pp.012028, 2022.
 35. M Santhosh Kumar, G Dineshkumar, S Saravanan, M Swathisriranjan, M Selvakumari, “Converter Design and Control of Grid Connected Hybrid Renewable Energy System Using Neuro Fuzzy Logic Model”, 2022 Second International Conference on Computer Science, Engineering and Applications (ICCSEA), pp.1-6, 2022.
 36. C Gnanavel, A Johny Renoald, S Saravanan, K Vanchinathan, P Sathishkhanna, “An Experimental Investigation of Fuzzy-Based Voltage-Lift Multilevel Inverter Using Solar Photovoltaic Application”, Smart Grids and Green Energy Systems, pp.59-74, 2022.
 37. C Nagarajan, K Umadevi, S Saravanan, M Muruganandam, “Performance investigation of ANFIS and PSO DFFP based boost converter with NICI using solar panel”, International Journal of Engineering, Science and Technology, Vol.14, Issue.2, pp.11-21,2022.
 38. K Priyanka, N Mohananthini, S Saravanan, S Saranraj, R Manikandan, “Renewable operated electrical vehicle battery charging based on fuzzy logic control system”, AIP Conference Proceedings, Vol.2452, Issue.1, pp.030007, 2022.
 39. V Kumarakrishnan, G Vijayakumar, D Boopathi, K Jagatheesan, S Saravanan, B Anand, “Optimized PSO technique based PID controller for load frequency control of single area power system”, Solid State Technology, Vol.63, Issue.5, pp.7979-7990, 2020.
 40. G. Poovarasan, S. Susikumar, S. Naveen, N. Mohananthini, S. Saravanan, “Implementation of IoT Based Poultry Feeder Box”, International Journal of Innovative Research In Technology, Vol.6, Issue.2, pp.33-38, 2020.
 41. N.Gokulnath, B.Jasim Khan, S.Kumaravel, Dr.A.Senthil Kumar and Dr.S.Saravanan, “Soldier Health and Position Tracking System”, International Journal of Innovative Research In Technology (IJIRT)), Vol-6 Issues 12, pp.39-45, 2020.
 42. P.Navaneetha, R.Ramiya Devi, S.Vennila, P.Manikandan and Dr.S.Saravanan , “ IOT Based Crop Protection System against Birds and Wild Animal Attacks”, International Journal of Innovative Research In Technology (IJIRT)), Vol-6 Issues 11, pp.133-143, 2020.
 43. V. Dhinesh, D. Prasad, G. Jeevitha, V. Silambarasan, Dr. S. Saravanan, “ A Zero Voltage Switching Pulse Width Modulated Multilevel Buck Converter”, International Research Journal of Engineering and Technology (IRJET), Vol 7 Issue 3, pp.1764,2020.
 44. K. Punitha, M. Rajkumar, S. Karthick and Dr. S. Saravanan, “ Impact of Solar And Wind Integration on Frequency Control System”, International Research Journal of Engineering and Technology (IRJET), Vol 7 Issue 3, pp.1357-1362,2020.
 45. A.Arulkumar, S.Balaji, M.Balakrishnan, G.Dineshkumar and S.Saravanan, “Design And Implementation of Low

- Cost Automatic Wall Painting Machine” International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 03, pp.170-176, 2020.
46. V.Periyasamy, S.Surya, K. Vasanth, Dr.G.Vijayakumar and Dr.S.Saravanan, “Design And Implementation of Iot Based Modern Weaving Loom Monitoring System” International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 04, pp.11-18, 2020.
47. M.Yogheshwaran, D.Praveenkumar,S.Pravin,P.M.Manikandan and Dr.S.Saravanan, “IoT Based Intelligent Traffic Control System” International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 04, pp.59-63, 2020.
48. R.Pradhap, R.Radhakrishnan, P.Vijayakumar, R.Raja and Dr.S.Saravanan, “Solar Powered Hybrid Charging Station For Electrical Vehicle” International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 04, pp.19-27, 2020
49. S.Shenbagavalli, T.Priyadharshini, S.Sowntharya, P.Manikandan and Dr.S.Saravanan, “Design and Implementation of Smart Traffic Controlling System” International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 04, pp.28-36, 2020.
50. M.Pavithra, S.Pavithra, R.Rama Priya, M.Vaishnavee, M.Ranjitha and S.Saravanan, “Fingerprint Based Medical Information System Using IoT” International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 04, pp.45-51, 2020.
51. A.Ananthan, A.M.Dhanesh, J.Gowtham, R.Dhinesh, G.Jeevitha and Dr.S.Saravanan, “IoT Based Clean Water Supply” International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 03, pp.154-162, 2020.
52. R.Anbarsan, A.Arsathparvez, K.S.Arunachalam, M.Swathisriranjani and Dr.S.Saravanan, “Automatic Class Room Light Controlling Using Arduino” International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 03, pp.192-201, 2020.
53. S.Karthikeyan, A.Krishnaraj, P.Magendran, T.Divya and Dr.S.Saravanan , “The Dairy Data Acquisition System” International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 03, pp.163-169, 2020.
54. M.Amaran, S.Mannar Mannan, M.Madhu, Dr.R.Sagayaraj and Dr. S.Saravanan, “Design And Implementation of Low Cost Solar Based Meat Cutting Machine” International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 03, pp.202-208, 2020.
55. N.Harish, R.Jayakumar, P.Kalaiyaran, G.Vijayakumar and S. Saravanan, “IoT Based Smart Home Energy Meter” International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 03, pp.177-183, 2020.
56. K.Subashchandrabose, G.Moulieshwaran, M.Raghul, V.Dhinesh and S.Saravanan, “Design of Portable Sanitary Napkin Vending Machine”, International Journal of Engineering Technology Research & Management (IJETRM), Vol-4 Issues 03, pp.52-58, 2020.
57. R.Gopi, K.Gowdhaman, M.Ashok, S.Divith, S.Saravanan and G.Dineshkumar, “An Online Method of Estimating State of Health of A Li-Ion Battery”, International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.31-36, 2023.
58. S.Azhaganandham, P.Elangovan, M.S.Kayalkanan, M.Dineshkumar and S.Saravanan, “Automatic Direct Torque Control System For 3 Phase Induction Motor”, International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.1-3, 2023.
59. K. Ranjith Kumar, A.Naveen, R.Ragupathi, S. Savitha and S. Saravanan, “Automatic Industrial-Based Air Pollution Avoidance System Using Iot”, International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.100-105, 2023.
60. G.T.Nandhini, V.Megasri, T.Jeevitha, S.Sandhiya and S. Saravanan, “Automatic Pick And Drop Helping Robot”, International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.72-76, 2023.
61. K.Deepika, S.Divya, A.Hema, R.Meena, V.Deepika and S.Saravanan, “Automatic Solar Panel Cleaning System”, International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.62-66, 2023.
62. A.Balaji, K.Harikiruthik, A.Mohamed Hassan, S.Saravanan and S.Saranraj, “Design and Implementation of A Single Stage Multi-Pulse Flexible Topology Thyristor Rectifier for Battery Charging in Electric Vehicles”, International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.37-42, 2023.
63. D.Hemalatha, S.Indhumathi, V.Myvizhi and S.Saravanan, “Design and Implementation of Intelligent Controller for Domestic Applications”, International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.4-7, 2023.
64. N.Priyadharshini, S.Saraswathi, T.Swetha, K.Sivaranjani, K.Umadevi and S.Saravanan, “Fuel Monitoring System using IoT”, International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.126-130, 2023.

65. S. Divyasri, E. Indhu, M. P. Keerthana, M. Selvakumari and S. Saravanan, "Gas Cylinder Monitoring System using IoT", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.67-71, 2023.
66. J.Arul, R.Balaji, S.Jeyamoorthy, M.Manipathra, R.Sundar and S.Saravanan, "IoT based Air Conditioner Control using ESP32", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.48-52, 2023.
67. Vundel Munireddy, J.Prahathesvaran, C.R.Thirunavukarasu, M.Santhosh Kumar and S.Saravanan, "IoT Based Charge Controller for Direct Fast Charging of Electric Vehicles Using Solar Panel", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.77-81, 2023.
68. D.Monish Kumaar, K.Akash, S.Aswinkumar, S.Saravanan and R. Sagayaraj, "IoT based Industry Surveillance and Air Pollution Monitoring using Drones", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.14-18, 2023.
69. T.Silambarasan, R.Surya, J.Pravinkumar, R.Sundar and S Saravanan, "IoT based Monitoring System For Sewage Sweeper", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.88-93, 2023.
70. R.Aravinthan, Alwin.Augustin, P.Divagaran, S.Saravanan and P.Manikandan, "IoT Based Power Consumption and Monitoring System", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.43-47, 2023.
71. S.Partheeban, S.Sundaravel, S.Umapathi, R.Sagayaraj and S.Saravanan, "IoT based Safety Helmet for Mining Workers", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.116-120, 2023.
72. D.K.Vignesh, K.Sabarishwaran, S.Yuvaraj, P.Manikandan and S Saravanan, "IoT based Smart Dustbin", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.82-87, 2023.
73. P Muthukrishnan, P Poovarasan, S Vasanth, R Raja and S Saravanan, "Smart Borewell Child Rescue System", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.121-125, 2023.
74. S. Gokul, B. Gokulnath, P. Manikandan, S.Saravanan and N. Mohananthini, "Smart Crop Protection From Animals And Birds Using Arduino", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.19-25, 2023.
75. M.Abinesan, S.Jawahar, S.A.Gopi, A.Gokulraj and S.Saravanan, "Smart EV Charging Hub Integrated with Renewable Energy for Highway Utility", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.58-61, 2023.
76. K.Eswaramoorthi, R.Manikandan, R.Balamurugan, C.Ramkumar and S.Saravanan, "Smart Parking System using IoT", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.53-57, 2023.
77. S.Nirmalraj, C.Pranavan, M.Prem and S.Saravanan, "Smart Trolley With IoT Based Billing System", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.111-115, 2023.
78. S. NithyaSri, S.S.Sabitha, M.Thilagavathi, S.Umamageshwari, C.Nithya and S.Saravanan, "Smart Wireless Notice Board using IoT", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.106-110, 2023.
79. V.Gunasekaran, M.Gowtham, S. Anbubalaji, S.Saravanan and R.Prakash, "Solar based Electric Wheel Chair", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.8-13, 2023.
80. S.Naveenkumar, S.Prakash, A.P.Shrikirishnaa, C.Ramkumar and S.Saravanan, "Two to Three Phase 5HP Digital Panel", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.94-99, 2023.
81. Harivignesh K, Jaisankar.A, Chandru.J, Saravanan.S and Raja.R, "Voice Controlled Automatic Writer", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.26-30, 2023.
82. N.Sakthiselvam, S.Srinivasan,S.Raajkumar, M.Selvakumari, S.Saravanan, "An Integrated Fault Isolation and Prognosis Method for Electric Drive Systems of Battery Electric Vehicles", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.166-171, 2023.
83. P Thava Prakash, P.Venketesan, D.Vignesh, S.Prakash, S.Saravanan, "Design of Low Cost E-Bicycle using Brushless DC Motor with Speed Regulator", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.148-153, 2023.
84. D.Tamilarasan, V.S.Vairamuthu, Y.Vasanth, K.Umadevi, S.Saravanan, "GSM based Agricultural Motor Control", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.172-177, 2023.
85. P. Vimal, S.Veerasingamani, R.Srihari, C.S.Satheesh, S.Saravanan, "IoT Based Optimal Power Management System For Smart Grid", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.160-165, 2023.
86. S.Abimanyu, P.Jagadheeswaran, S.Jaganath, K.Sanjay, R.Sivapranesh, K.Velmurugan, N.Mohananthini, C.S.Satheesh, S.Saravanan, "Portable Solar Tree", International Journal of New Innovations in Engineering and

Technology, Vol.22, Issue.3, pp.154-159, 2023.

87. J.Sriboopathi, G.Sridhar, R.Sharunesh, S.Tamilarasan, S.Saranraj and S.Saravanan, "A Dual Stage Power Electronic Converter for Electric Vehicle Charger", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.197-202, 2023.
88. M.Karthikeyan, S.Bilalahamad, V.A.Chandru, V.Deepika and S.Saravanan, "Design and Development of IoT based Motor Starter", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.178-183, 2023.
89. S.Yokesh, M.Manoj Kumar, M.Sankar, G.Dineshkumar and S.Saravanan, "Estimation of Maximum Power in Lithium Ion Batteries using IoT", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.191-196, 2023.
90. P.Preedeepa, S.Sivaranjani, M.Nandhini, M.Swathisriranjani and S.Saravanan, "Optimization of Power Quality Issues in EV Charging Station", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.203-209, 2023.
91. R. GokulRaj, N. Kannan, S. Karthick, M.Swathisriranjani and S.Saravanan, "Power Quality Enhancement in Smart Grids for Electric Vehicles Charging Station", International Journal of New Innovations in Engineering and Technology, Vol.22, Issue.3, pp.184-190, 2023.

International Journal of Advanced Research in Education and Technology

ISSN: 2394-2975

Impact Factor: 7.394