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Automatic EV Battery Management and control Systems using IOT

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Abstract: ***From the statistics, transportation sector contributes over the 50% of the oil consumption and one fourth of the CO2 emissions, which has been considered one of the major factors that leads to Greenhouse effect. By using the Electric vehicles (EVs), the pollution can be reduced and also the dependency on crude oil and also minimizing the transportation related pollutants emission, this regarded as the effective component in the sustainable transportation system and also becoming popular. Here, in this work the proposed design is to create and also handle the electric vehicles (EV) charging and utilization of a vehicle, based on the intelligent process. Because of the electrical power distribution limitation, electric vehicles (EV) charging must be performed in the effective way. This proposed system for Electric Vehicle Charging system and utilization having many advance features. The device will automatically stop the charging and overcharging will not happen in battery. Different parameter will be monitor and based on the parameter battery charging and utilization for load will be control automatically in this implementation.***

Keywords: Micro-controller, BMS, Temperature Sensor, Voltage Sensor, Electric Vehicles (EVs).

I. INTRODUCTION

However, from the massive penetration of the electric vehicles (EV) which brings the major challenge of electric vehicles recharge related issues.

For this we need to provide electrical energy, battery management and charging technology of electric vehicles considering actual EV field trips are attracting more and more attention from researchers. The creation of battery management system structures is critical to lessen the power request of the framework. Subsequently, sustainable powers sources emerge with develop innovation furthermore. .

An automotive industry is one of the most important industries across the world-wide, but not only at the economic level, and also in terms of the development and research. Increasingly, nowa days there are lot of technological elements has been (or) being introduced on vehicles because to improve the both pedestrians and passengers safety. In addition to this, there are greater number of vehicles on roads, which allows us to move comfortably and quickly.

However, this may led to the dramatic raise in air pollution levels mostly at the urban environments (i.e., pollutants, such as, nitrogen oxides (NOX), carbon monoxide(CO), sulfur dioxide (SO2) and PM etc.). And according to the report, the transport sector is responsible for approximately 28% of the total carbon dioxide (CO2) emissions, and the road transportation is accountable for a overall of 70% of a transport sector emission. However, the authorities of most of the developed countries are encouraging Electric Vehicles (EVs) to avoid air pollutants, carbon dioxide CO2, and other greenhouse gases. So electrical vehicle is best option over this all issues.

But battery management for charging and utilization of electrical vehicle is again new task. We are implementing battery management system in this project for solve this charging and utilization issue for battery.

II. LITERATURE SURVEY

A. *VikasBhandare, DangePrachi, EEE Department, Sanjay Ghodawat Group of Institutions, Kolhapur The International journal of analytical and experimental modalanalysis*

This paper aims at building a Battery Management System model for lead acid battery needed in electrical vehicles that continuously monitors the operational parameters of battery and take necessary actions like protection of batteries, display of battery information etc. This BMS model aims to various objectives. There will be continuous monitoring of various battery parameters like voltage, current and temperature going on. Based on this data the control measures will be taken by the controller in the BMS.

B. NURUL FITRIYAH ROSLANOcean Informatics and Engineering Technology , universitiy of Malaysia Terengganu, 21030 Kuala Terengganu at Malaysia.

In this paper, study carried on the implementation and development of the BMS (battery management system) by using Arduino Uno microcontroller has been used .Here the circuit has developed by the voltage sensor, current sensor and a LCD for the monitoring purpose. It is used successfully to monitor the battery SOC to ensure that it is not overused nor overcharged.

C. P.Dharani, T.NandhiniDepartment of EEE, Sengunthar Engineering College(Autonomous), Tiruchengode.SurajPunj Journal for Multidisciplinary Research.

The aim of our project is protect the battery cells from damageand increase the lifespan of battery. Our proposed system battery's electrical parameter are measured at the same time it can be displayed in LCD screen. Any abnormality of battery status. It means, parameter values are differ from the normal value sound notification should be ON condition, for alerts thepersonnel.

D. Anurag Busha, VakeeshKannaJournal of a Emerging Technologies and Network Communications (JNCET)Volume 8, Issue.

This project is an attempt to overcome the problem of overheating of the battery thus saving the battery, device and thecharger. The devices give a signal as soon as they are fully charged which in turn will be transferred to the Arduino board. As soon as the Arduino board receives the signal, theconnection from the Arduino to the extension cord will be disrupted leading to no power supply to the devices hence saving it from any further damage and keeping it safe for use.

E. Dr.Viswanath& Dr. M. Rajaram Narayanan Departmentof EEE (Electrical and Electronics Engineering), Shadan College of Engineering and Technology HYDRABAD,TELANGA,INDIA.

The objective of this paper is to check or monitor the health condition of a battery, temperature of a battery and also its over voltage protection by using MQTT a mobile application. The battery will have a great impact on the performance of electric vehicle, basically it determine the driving range. In this paper, the main objective is how it uses hardware modules such as overvoltage protection circuit and NODEMCU.

III. COMPARISON TABLE

Author andYear	Title	Comment
VikasBhandare, DangePrachi , EEE Department,Sanjay Ghodawat Group of Institutions,Kolhapur (2018)	A Battery ManagementSystem model for a battery needed in electrical vehicles	The overall consistency of the system will be subjectto future work and Efforts should also bemade to make the device more user-friendly.

		The proposed systemuses simple components such as sensors, There will be continuous monitoring of various battery parameters like voltage, current and temperature going on. Based on this data the control measures will be taken by the controller in the BMS.
NURUL FITRIYAH ROSLANOcean Informatics and Engineering Technology, university Malaysia ,21030Kuala Terengganu, at Malaysia. (2017)	Design and Implementationof Battery Management ofelectrical vehicles	The main limitation of the LiFePO4 LFP batteries they are super flat slope of SOC graph and OCVgraph as explained ,this makes balancing cell and SOC estimation among the battery system makes challenging .For this batteries need to have low internal resistance, high energy density , long cycle andcalendar life. Hence it should be well trained battery model an also with suitable estimation methods that can be adopted to achieve joint or independent state estimation of internal temperature or battery SOC along withthe dynamic resistance

P.Dharani, T.Nandhini Department ofEEE, Sengunthar EngineeringCollege (2020)	Batteries and Battery Managementof electrical vehicles	Here a improved batterymodel was introduced in this work by considering its temperature effect, self discharging effect and the fading capacity effect as observed in all the batteries. Here, this model is simulated by Simulink / Matlab, and the simulation is done and results were discussed.
Anurag Busha, VakeeshKannaJournal of Network Communications and Emerging Technologies (2018)	Batteries and Battery Management of electrical vehicles	Here, clearly it is demonstrated that with how much focus or carefully optimization and modeling can affect the result in parameters. Which are applicable in a wide range of temperatures. So, it needs careful modeling it can be achieved by using a strategy and scaling. The batteries impedance will change whenever thetemperature changesand other states of battery changes . The real time impedance estimation is necessary for the battery for effective battery management. By this we can summarize that real-time approach for the batteries impedance estimation.

Dr.Viswanath&Dr. M. RajaramNarayanan Department of Electrical and Electronics (2015)	Battery Management System	The main objective ofthis is to hold a discussion about the BMS and also about the BMS safety for its various applications.This article analyzesand consolidates the present standards landscape and recommends, where we needed, thesafety and technical measures for the new BMSstandard. .

IV. CONCLUSION

The major contributor for the air pollution and carbon dioxide (CO2) emissions etc, is the transportation sector .So, by the widespread adoption of Electric Vehicles (EVs) is a major solutionfor the de - carbonize transportation sectors and environmental problems.

From this project we developed a system for management andcontrol battery for charging and utilization of a battery.

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[4] Anurag Busha, VakeeshKanna Journal of Network Communications and Emerging Technologies (JNCET) Volume 8, Issue.
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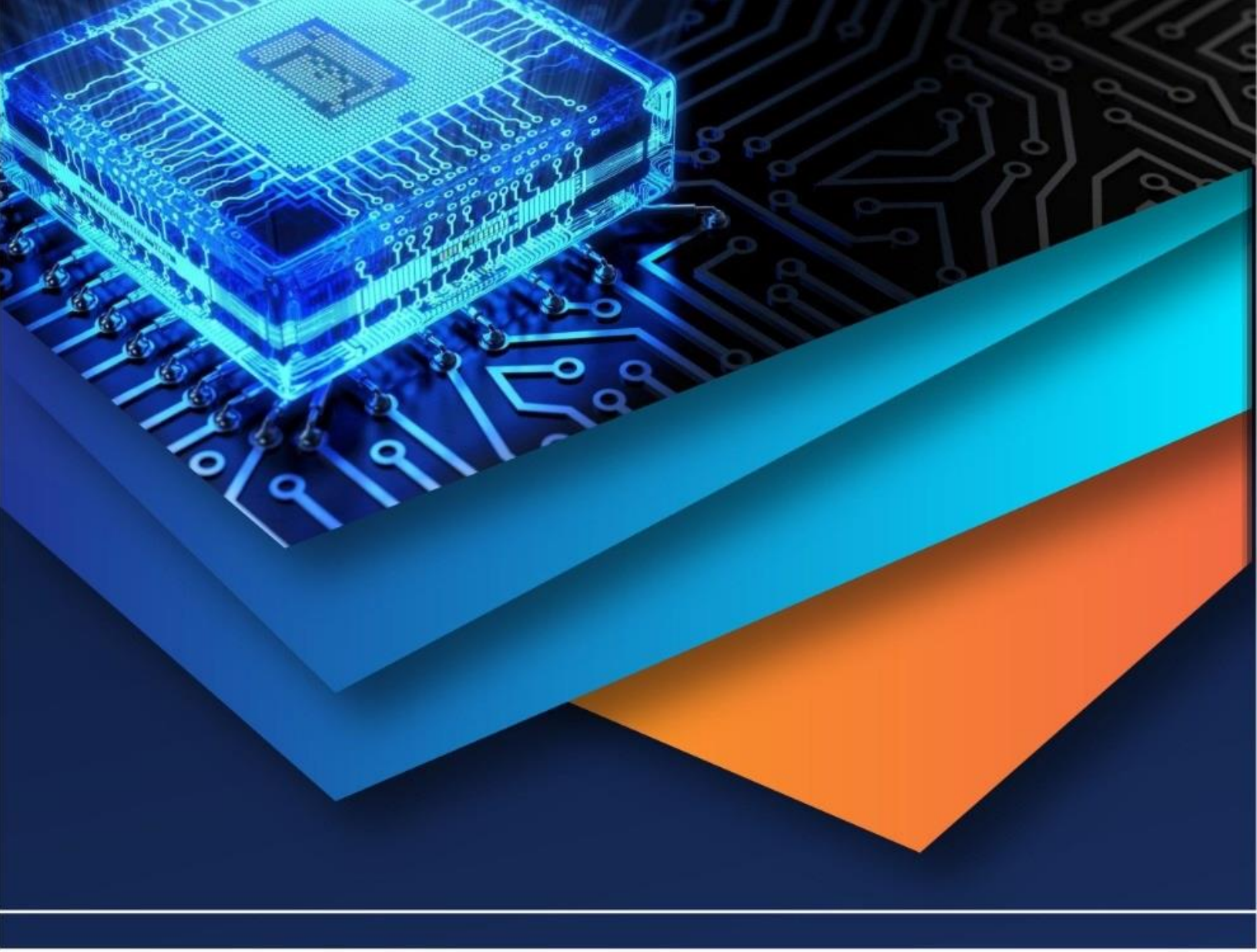

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