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Solar Operated EV Parameter Monitoring using IOT

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ABSTRACT: Electric vehicle plays a Vital role in Limitation of Greenhouse gas and Carbon dioxide pollution. These E-Vehicles are running because of the Rechargeable Batteries. This project is enabled with IOT Technology which focuses on the Status of Charge (SOC) of the Lithium-Ion Battery of an Electric Vehicle, The SOC is calculated by using the Coulomb integral method and sends the data to the cloud and can view the data in ThingSpeak software. We can also view our data in LCD screen which will be placed in the E-Vehicle so that user can view the data while riding the Electric vehicle. Virtuino App is also used to track the vehicle location when it is in a stationary state which is done for security purpose. Also we Designed prototype of vehicle on robot chasis. – Robots are more efficient if they can perform autonomously and without human interaction. Our project presents the idea of a robot car that can sense any obstacle and maneuver around it. The current situation in world scenario demands of such more robots that can be employed in military uses, autonomous interconnected cars, in drones as delivery services and even as a general multipurpose safety device to avoid accidents.

KEYWORDS: Electric Vehicle(E-Vehicle),Status of Charge(SOC),Lithium-ion battery, Internet of Things(IOT), ThingSpeak,, ESP8266-Node MCU

I. INTRODUCTION

Nowadays, electric vehicle (EV) is becoming popular since the fuel prices becoming more expensive. Due to these scenario, many vehicle manufacturer looking for alternatives of energy sources other than gas. The use of electrical energy sources may improve the environment since there are less pollution. In addition, EV produces great advantages in terms of energy saving and environmental protection. Most EVs used rechargeable battery which is lithium ion battery. It is smaller to be compared with lead acid. In fact, it has a constant power, and energy's life cycle is 6 to 10 times greater compared with lead acid battery. Lithium ion battery life cycle can be shortened by some reasons such as overcharging and deep discharges. On the other hand, EV usually has limited range of travelling due to battery size and body structure. Now, an important reason that limits the application of EV is the safety of existing battery technology [1]. For example, overcharging battery not only could significantly shorten the life of the battery, but also cause a serious safety accident such as fire [2-4]. Therefore, a battery monitoring system for EV that can notify the user about battery condition is necessary to prevent the stated problems.

Previous battery monitoring system only monitor and detect the condition of the battery and alarmed the user via battery indicator inside the vehicle. Due to the advancement of the design of notification system, internet of things (IoT) technology can be used to notify the manufacturer and users regarding the battery status. This can be considered as one of the maintenance support procedure that can be done by the manufacturer. IoT utilizes internet connectivity beyond traditional application, where diverse range of devices and everyday things can be connected via the internet, making the world is at the user's finger tips.

II. RELATED WORK

Electric vehicle (EV) is one that is made to run by an electric motor rather than an internal-combustion engine(IC) . It generates energy by burning a mixture of Petroleum and its other products. Due to Which , these vehicle are found out to be a one of the replacement for current-generation of vehicles in order to address challenges such as rising pollution, global warming, and natural resource depletion. Electrical vehicles are

attracting customers due to its environment-friendly nature as it does not have an internal-combustion engine which creates harmful gases for the planet, also they have less cost of maintenance and they are potential to a tax credit as the customer is cutting down the impact on the environment by choosing a zero-emission system. Countries like the United States, China and Japan had updated its policies and standards to support the development of EVs.

Electric vehicles, which run on batteries rather than gas engines, are becoming more common. Electric vehicles are preferred by those who want to safeguard the environment and maybe go greener. However, many people are astonished to hear that electric vehicles are not a new technology. While it is unclear who invented the first electric car, electric motors were clearly in use as early as the 1800s. Around 1828, Anyos Jedlik invented the very first electric motor [1]. Using a small electric engine, he developed a self-moving tiny model automobile. A bigger electric motor designed by Scottish inventor Robert Anderson has been used to run a carriage between 1832 and 1839 [2].

American innovators returned to the electric car in the 20th century. William Morrison created what many consider to be the first practical electric car around this 2 period, however it lacked range. During this period, hybrid vehicles were also developed to address a variety of concerns with electric vehicles. Electric vehicles in the entire history have never been so in news, and a lot of them can drive many miles just by charging only once. In 2008, Tesla introduced the Roadster. Due to many hindrance and faults, it was being able to travel which was more than 200 km just by charging once. It was quickly followed by the Mitsubishi kilometres in Japan. The creation and introduction of these two cars, particularly Tesla, signalled the start of the modern era of electric vehicles. Other major automakers rapidly followed behind, developing evs of their own. A vast number of people had already created hybrids, suggesting that the method was well-established. The Chevrolet Volt was made by General Motors, and the Nissan Leaf was presented by Nissan. Smaller companies, such as Tesla, are pushing significant advancements inelectric vehicles [3].

An electric car can be purchased for a variety of reasons. The motors are whisper quiet, and the trip is wonderfully relaxing. Since the power is sent directly to the wheels, the torque is higher than most people believe. There's no need to stop at a gas station, and while drivers must pay for the electricity needed to charge the car, it's less expensive than gasoline.

III. METHODOLOGY

As the Electric vehicles are getting popular the batteries are mainly required for the electrical energy storage in EVs. The evolution in city transportation has boosted over the last few decades which in turn increased the growth of societies and industry for the use of vehicle so the batteries must maintain and monitored. Though battery is a commonly used device for the storage of energy, calculation of Status of Charge of the battery plays a vital role in the future. This days, vehicles are essential in the day to day life and for industrial use as well. Sufficient effort is being done to withdraw the combustion engines by electric motors. Due to the increase in Carbon dioxide (CO₂) caused by the industries and transportation, the Kyoto treaty was signed. This treaty was aimed to reduce the level of CO₂ and has boosted the findings for new clean energy solutions. As a finding, Electrical Vehicles (EVs) appeared as a solution to reduce CO₂ emissions. Electric Vehicles are increasing day by day across the globe when the number of Electric vehicles is increasing, the demand for the batteries is also increase so these batteries must maintain and monitor So this project focused on checking the Status of charge (SOC) i.e (it shows the remaining battery capacity which is in percentage) to increase the life of battery by checking and maintaining the various parameter of the Battery like Voltage, Current, Temperature, Vibration Level and Speed of the Lithium-Ion Battery.

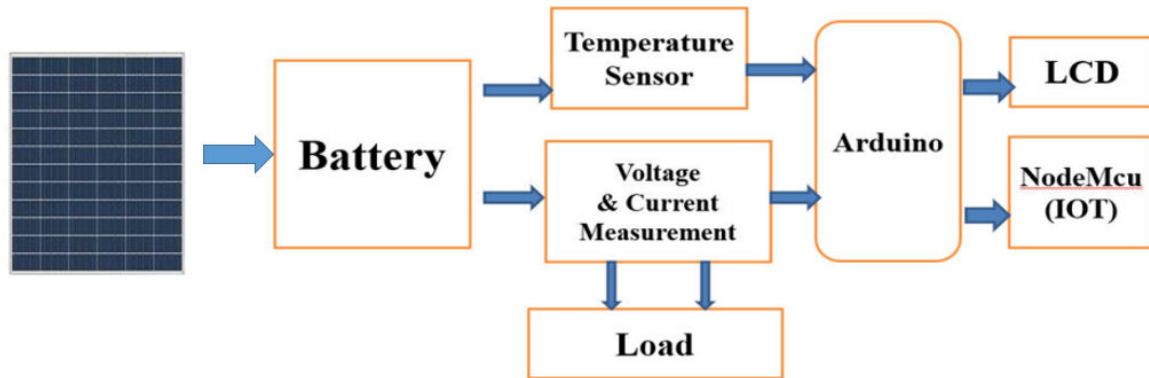


Fig 1 Block diagram Of proposed system

Fig (1) shows the entire system Block Diagram of the Proposed system where the cells are connected in series and the parameters of the lithium ion battery is measure then for discharging of the battery load is said to be used, this parameters such as Temperature , voltage , current , speed , Charge Time , Status of charge and Vibration level of the battery is measured to avoid the short circuit of the battery and then ir is send to the Arduino Uno and the data is viewed in ThingSpeak software via NodeMcu(IoT) and it is also displayed in LCD Display.

IV. EXPERIMENTAL RESULTS

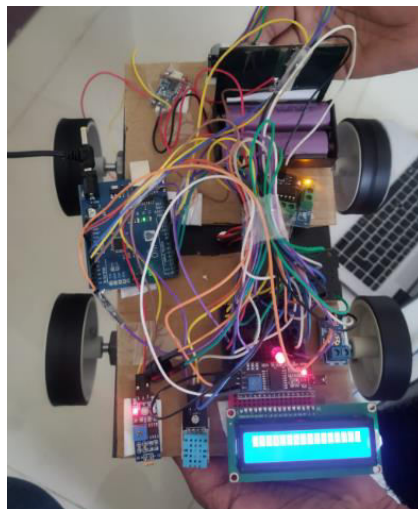


Fig 2 Final Model Snapshot

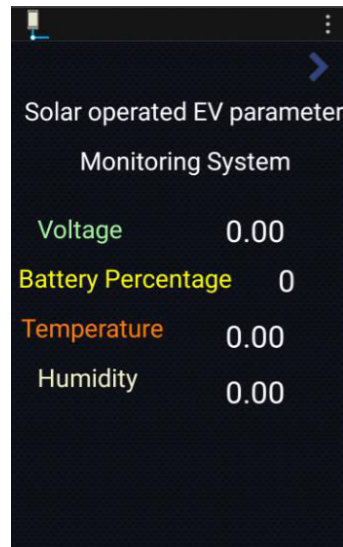


Fig 3 Final Mobile App Result snapshot

V. CONCLUSION

We have implemented an automatic text detection technique from an image for inpainting. Our algorithm successfully detects the text region from the image which consists of mixed text-picture-graphic regions. We have applied our algorithm on many images and found that it successfully detects the text region.

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