IJARSCT

ISSN (Online) 2581-9429

International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)

International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal

Impact Factor: 7.301

Volume 3, Issue 1, June 2023

Electric Vehicles Charging Station to Swap the Battery with using Mobile App

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Abstract: *This Project proposes Continuous Battery Monitoring System to identify the battery condition. The Continuous Battery Monitoring System is able to detect the battery failure during the early stage of the event. The Continuous Battery Monitoring System will monitor the battery's voltage continuously. Measuring the voltage of the battery is the specialty of the proposed Continuous Battery Monitoring System for early battery failure detection. With that, the system will be able to measure the battery's capacity and will be able to measure the left-over capacity. The Monitoring System to allow the system to operate at real time basis and as well as monitor the battery's voltage continuously. In addition to this we are developing android app for battery slots availability and payment mode option, the payment amount will be send to the station, if payment is successfully paid means GCM Google could message will send the SMS to user.*

Keywords: ESP 8266, Voltage Sensor, Current Sensor, IR Sensor, Bluetooth Module, LCD Display, GPS module, Relay, Power adapter, Battery

I. INTRODUCTION

Battery is known for its capacity to store electrical energy in the form of usable energy which energy can be used when it is required. With that, battery is an essential device to store the energy for devices ranging from small electronics to large system such as renewable energy systems.

Small electronic devices such as video/audio player, medical equipment, power tools, meters and data loggers, and remote sensors are installed with batteries.

Installed batteries in these devices freed the users from the power cord connection and allow the users to portable application. Periodically the stored energy in the batteries installed in this application will reduce and these batteries require a charging process to restore the capacity.

II. METHODOLOGY

In order for the system to work, initially, the voltage sensor measures the lithium-ion battery's voltage level. At the same time, a GSM/GPS/GPRS shield reads the location of the station by using the GPS function.

The battery's voltage level readings and location of the vehicle are conveyed to an microcontroller for processing. As shown in the figure, the processed data are sent to a battery monitoring user interface in a computer wirelessly using the GPS shield.

Once data transfer is successful, the battery monitoring interface on the computer will show the updated data of battery status. When the battery produced low voltage level, a notification email is sent to notify the user. The online battery system not only can measure the voltage of the batteries but also communicate with the battery monitoring system to get the parameter of batteries

- Assembly: The selected components will be assembled according to the design, and the robot will be fabricated.
- Programming: The Arduino board will be programmed to control the robot's movements and sensor readings. The programming will also include the logic for garbage collection and storage.

- Testing: The robot will be tested in a controlled environment to ensure that it meets the requirements and functions as intended. The testing will include testing the robot's movements, sensor readings, and garbage collection and storage.
- Deployment: Once the testing is successful, the robot will be deployed in water bodies for garbage collection.
- Maintenance: Regular maintenance of the robot will be required to ensure its continued operation, including battery replacement and sensor calibration.

The methodology will be iterative, with each stage informing the next. Any issues or problems that arise during the testing or deployment stages will be addressed, and the design and programming will be updated accordingly.

B. The methodology for developing the Arduino based solar powered robot for water garbage collection will involve the following steps:

1. Design and prototyping: The initial step will involve designing and prototyping the robot. The robot will be designed using CAD software, and a 3D printer will be used to create the prototype. The robot's design will be customizable and scalable to suit different water bodies and garbage collection needs.
2. Sensor integration: The robot will be equipped with sensors to detect and collect garbage floating on the surface of water bodies. The sensors will include ultrasonic sensors or a vision system that will detect the garbage and trigger the robot to collect it.
3. Solar power integration: The robot will be powered by solar energy, which will be collected by a solar panel installed on top of the robot. The solar panel will be designed to collect maximum energy from the sun and convert it into electrical energy to power the robot.
4. Microcontroller programming: An Arduino microcontroller will be used to control the robot's movement and garbage collection mechanism. The microcontroller will be programmed to read data from the sensors and control the robot's movements and garbage collection mechanism.
5. Testing and optimization: Once the robot is developed, it will be tested in a controlled environment to ensure that it is working as intended. The robot's performance will be optimized by tweaking the programming and sensor calibration to improve its garbage collection efficiency.
6. Field testing: The robot will be tested in real-world conditions, such as in lakes, canals, and rivers, to evaluate its performance and efficiency. The results will be analyzed to identify areas for improvement and optimization. Normal PCs are replaced by 7 gen PCs.

III. PROBLEM DEFINATION

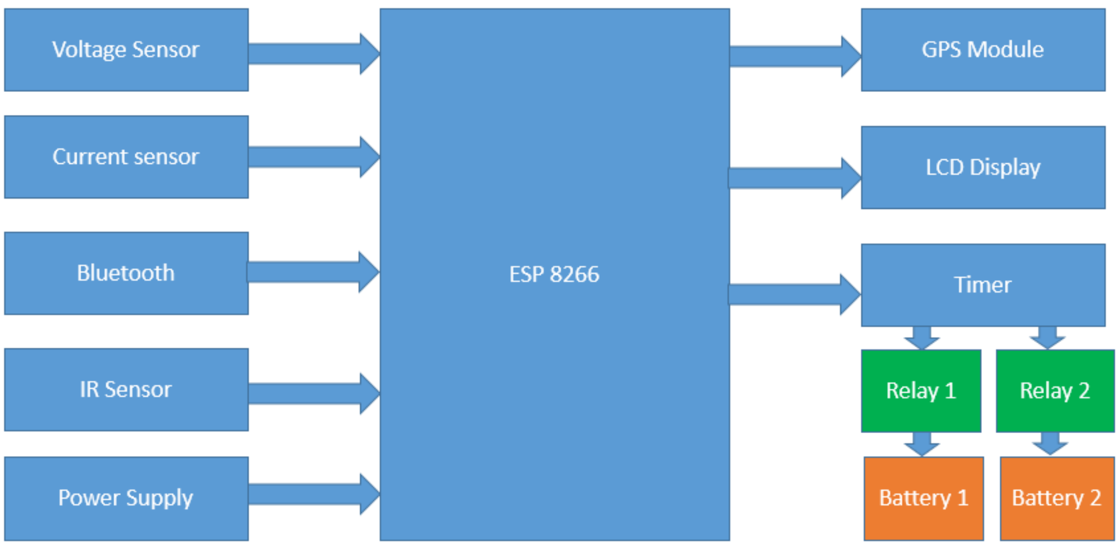

Fig 1 Block Diagram

To find a solution for the problem of water logging due to plastic, thermocol, paper and other floating debris etc. To treat problems like malaria, typhoid, etc. caused due to water accumulation. The key challenges include the design of a system that can effectively collect and remove garbage from rivers, the integration of solar power as the primary energy source for the system, and the development of a sustainable and cost-effective solution. A solar-based river water garbage collector is a system that uses solar power to collect and remove garbage from rivers. The problem definition of such a system involves identifying the challenges and issues that need to be addressed in designing and implementing it. Overall, the problem definition of a solar-based river water garbage collector involves identifying and addressing the technical, environmental, and logistical challenges of designing and implementing a system that can effectively remove garbage from rivers using solar power

IV. CONCLUSION AND FUTURE SCOPE

This project battery monitoring system using microcontroller to control the core management to build battery information collecting subsystem, and the lead-acid battery 6V for the design of hardware and software realization of battery information collection, which is characterized by powerful function and low cost, stable operation, reliable and in practical, our experimental study shows a good performance. We are willing to cooperate with the manufacture the technology is applied to the industrialization.

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