Department of Electrical and Computer Engineering
North South University

Senior Design Project

IoT BASED BATTERY HEALTH MONITORING SYSTEM BY USING ESP32

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DECLARATION

It is hereby acknowledged that:

We hereby solemnly declare that this senior project report is no illegitimate procedure has been practiced during the preparation of this document. We also affirm that this report has not been submitted elsewhere for any other purpose.

This document represents our own accomplishment while being Undergraduate Students in the North South University.

Sincerely,

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APPROVAL

I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation. This senior design project report has been submitted by Abu Abrar Chowdhury & Ariful Islam , a student from Electrical and Computer Engineering Department of North South University.

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ABSTRACT

Now-a-days most of the electric devices are battery dependent. That’s why it is important to check battery health regularly. Battery health monitoring system using ESP32 is an easy way to monitor the battery voltage and percentage from anywhere in the world, and also measure current and temperature by IOT based. Therefore, this system is useful for monitoring battery charging/ discharging status remotely controlled.

A Battery Health Monitoring System (BHMS) is a device that is used to monitor the state of a battery and track its performance over time. It is used to monitor the battery's voltage,temperature,humidity and battery health. The system can alert users when the battery's health is declining, and can provide recommendations for when the battery should be replaced. BHMS can be used for various types of batteries, including lead-acid batteries, lithium-ion batteries, and nickel-metal hydride batteries. The system can be used in a variety of applications, including electric vehicles, renewable energy systems, and backup power systems.

IoT Based Battery Health Monitoring System" uses the ESP32 microcontroller and IoT technology to monitor the health of batteries. The system measures the voltage and temperature of the battery and sends the data to a cloud server for storage and analysis. The project provides real-time monitoring and alerts to help extend the life of the batteries and ensure reliable performance.

Overall, the use of a battery health monitoring system can help to improve the reliability and performance of battery-powered systems, and can also help to reduce the environmental impact of these systems by extending the useful life of the batteries.The estimation of State-of-Charge, State-of-Health, Discharge Rate, and Remaining Useful Life are then derived by utilizing the concept of correlation and regression from the yielded real-time parameters recorded to the SD card module. This study paves the way for the comprehensive and continuous progress of battery identification, monitoring, and diagnosis that is a thorough advancement in the E-Vehicle industry.

Keywords: Battery management system, Li-Ion, ESP32 Arduino-based management system, State of charge, State of health, Remaining useful time, Discharge rate.