

Performance Improvement of EV Charging Using Regenerative Braking and BMS

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Abstract: *This paper explores the development of an advanced Battery Management System (BMS) for electric vehicles (EVs) utilizing an ESP32 microcontroller, focusing on enhancing battery performance and safety through the integration of regenerative braking technology. The BMS aims to optimize battery health by employing real-time monitoring with various sensors, including voltage, temperature, current, and flame sensors, thereby ensuring efficient power delivery and hazard detection. By incorporating a DC motor and inverter kit, the system facilitates effective energy conversion and harnesses regenerative energy during braking to extend the vehicle's range. This innovative approach not only promotes sustainability by improving energy efficiency and battery lifespan but also contributes to the overall safety and reliability of electric vehicles, addressing key challenges in current EV technology*

Keywords: EV Battery Management, Regenerative Braking, Energy Optimization, ESP32 Microcontroller, Real-Time Monitoring

