

## **ABSTRACT**

Electric vehicles are increasingly becoming the primary focus of sustainable transportation technology development. To achieve high efficiency level in electric vehicles, advanced control of Brushless Direct Current (BLDC) motors is crucial. In this project, we designed and developed a 500 Watt BLDC motor controller equipped with regenerative brake features and an Internet of Things (IoT)-based monitoring system.

Our BLDC motor controller is designed to provide precise control over the motor, enabling electric vehicles to accelerate responsively. Additionally, the controller features regenerative brake capabilities that can convert kinetic energy into electrical energy when the vehicle comes to a stop or decelerates, thereby enhancing the overall energy efficiency of the vehicle.

The IoT-based monitoring system integrated with the motor controller allows remote monitoring and control through Wi-Fi connectivity. Performance data, temperature, voltage, and current information can be accessed through a mobile application, facilitating real-time monitoring and in-depth data analysis to improve the efficiency, reliability, and maintenance of electric vehicles.

This research combines advanced BLDC motor control technology with regenerative brake capabilities and IoT connectivity via Wi-Fi. The result is an electric vehicle that is more efficient, environmentally friendly, and easily accessible and manageable through the internet network. It is expected that this contribution will drive the development of smarter and more sustainable electric vehicles in the future.

**Keywords :** Controller, BLDC, Regenerative, IoT.