

## **ABSTRACT**

The battery is a crucial component of electric vehicles, including electric bicycles. During usage, the battery may experience a decline in quality due to several factors, including overcharging, allowing the battery to reach very low or nearly depleted levels (deep discharge), uneven charging of each cell, short circuits during battery charging, and high temperatures during the charging process.

To prevent battery degradation, it is necessary to take measures such as current interruption in the event of a short circuit to prevent battery damage, implementing passive balancing during battery charging, managing overcharge and overcurrent conditions, monitoring temperature during both charging and discharging, and ensuring that the BMS is compact enough to facilitate easy placement within the battery pack of an electric bicycle.

In response to these issues, the author intends to design a device called a Battery Management System (BMS) to be integrated into the battery pack of an electric bicycle. This BMS will feature overcharge detection, deep discharge prevention, passive balancing, automatic voltage cut-off, remote BMS cut-off monitoring to the load, and temperature detection during charging. The goal is to ensure the battery remains in optimal condition at all times.

Keywords: Battery Management System, IoT, Passive Balancing, SOC, Temperature