



Project: Performance Estimation of Battery pack under Different Drive Cycle



Contents

Background:	2
Objectives:	2
Methodology:	2
Expected Outcomes:	3
Conclusion:	



Background:

Electric vehicles are becoming increasingly popular due to their environmental benefits and cost savings. However, the performance of electric vehicles largely depends on the battery pack, which is the primary source of energy for the vehicle. In order to optimize the performance of electric vehicles, it is important to understand how the battery pack performs under different driving conditions. This project aims to estimate the performance of a battery pack under different drive cycles using MATLAB.

Objectives:

The main objectives of this project are as follows:

- To define different drive cycles for electric vehicles.
- To collect data on the battery pack and the drive cycles.
- To model the battery pack using MATLAB.
- To simulate the battery pack's performance under different drive cycles using MATLAB.
- To analyze the simulation results to determine the battery pack's performance under different driving conditions.

Methodology:

The project will be divided into the following phases:

Drive Cycle Definition: Different drive cycles will be defined based on real-world driving data or created based on typical driving patterns.

Aim- Define the Following drive cycle.

- MIDC
- FTP 75

Analyze the data on different condition as listed below.

- Acceleration
- Steady Speed
- Deceleration
- Idling
- Gear Change

Data Collection: Data on the battery pack and the drive cycles will be collected using appropriate tools and techniques.



Aim- To extract the Data on the Excel Sheet.

Procedure-

On Excel Sheet, Prepare the data sheet for speed (m/s) and time duration (Sec).

Battery Pack Modeling: A battery pack model will be created using MATLAB. The model will predict the battery's performance under different driving conditions based on its specifications.

Aim- To create a Battery Pack of Rating 72V and 36Ah. Procedure

- Use single Cell of rating 3.7V and 2Ah to get required specification
- Do the required calculation.

Simulation: The battery pack model will be used to simulate the battery's performance under the selected drive cycle using MATLAB.

Aim- Run the Simulation under the following drive cycle

- MIDC
- FTP 75

Analysis: The simulation results will be analyzed to determine the battery pack's performance under different driving conditions. The battery's state of charge, voltage, and temperature will be analyzed, as well as the total energy consumption and range.

Expected Outcomes:

The following outcomes are expected from this project:

A better understanding of the Drive Cycles.

A better understanding of the performance of battery packs under different drive cycles. A battery pack model that can predict the battery's performance under different driving conditions.

Conclusion:

This project aims to estimate the performance of a battery pack under different drive cycles using MATLAB. The project will provide a better understanding of the performance of battery packs under different driving conditions.