

What causes abnormality in a battery?

From the detection results and the voltage variation trajectories of cells, it can be concluded that the detected abnormality is a rapid descent of voltage caused by the battery pack that is discharged with a high rate current in a low voltage stage.

How to detect abnormal battery cell voltage?

For the voltage abnormality, an accurate detection and location algorithm of the abnormal cell voltage are attained by combining the data analysis method and the visualization technique. Firstly, the faulty or abnormal battery cells' voltage is roughly identified and classified using the K-means clustering algorithm.

What happens if a battery is faulty?

During the operation of the battery system, the current stays the same, and the changing trend of the terminal voltage is theoretically consistent for the series-connected battery pack. If a cell has faults, its voltage trend will be different from others.

How do you know if a battery has a fault?

During the fault, the cell number of the highest battery voltage in the data list changes from time to time, while the cell number of the lowest battery voltage is always 95. According to the cell number corresponding to the minimum voltage value, it can be determined that cell 95 is an abnormal cell.

Why is cell voltage inconsistency a problem?

Cell voltage inconsistency of a battery pack is the main problem of the Electric Vehicle (EV) battery system, which will affect the performance of the battery and the safe operation of electric vehicles. In real-world vehicle operation, accurate fault diagnosis and timely prediction are the key factors for EV.

What is anomaly detection method for battery cells?

The anomaly detection method for battery cells presented in this article has low calculation complexity and high execution efficiency and can achieve anomaly detection. However, it struggles to distinguish between abnormal voltages caused by fault cells and their specific reasons.

Cloud Platform-Oriented Electrical Vehicle Abnormal Battery Cell Detection and Pack Consistency Evaluation With Big Data: Devising an Early-Warning System for Latent Risks ... battery-voltage ...

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clustering algorithm [33]. Secondly, the abnormal cell voltage is located based on the designed coefficient that

If the absolute difference exceeded the 0.1 V threshold, the deviation of the cell was considered to be abnormal. ... Nominal voltage of battery cell: 3.65 V: Rated motor power: 42 kW: Rated motor torque: 60 Nm: Download: Download high-res image (770KB) Download: Download full-size image;

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However, abnormal voltage fluctuations occur to cell 78 at some point, which successively triggers under-voltage and over-voltage warning. It can be found in the enlarged drawing that the voltage of cell 78 drops drastically as the accelerator pedal stroke rises rapidly so that the first-level under-voltage warning is triggered.

In this paper, we propose a data-driven voltage-abnormal cell detection method, using a fast model with simple architecture, which can detect voltage-abnormal cells based on the multi-source time series data of the LIB without a time interval.

However, as the batteries are used for extended periods, some individual cells in the battery pack may experience abnormal failures, affecting the performance and safety of the battery pack.

In order to solve this problem, this article proposes an anomaly detection method for battery cells based on Robust Principal Component Analysis (RPCA), taking the historical operation and maintenance data of a large-scale battery pack from an energy storage station as the research subject.

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With the rise of the voltage, the voltage of the abnormal cell cannot even rise to the same level as that of normal cells. Fig. 12 (c) shows the RMSE of each battery cell in 100 windows. We found that compared with the reconstructed signal in the former case, the reconstructed signal has a larger deviation in the constant voltage section of ...

Through battery connection fault experiments, Shannon entropy was employed to identify cells with abnormal internal resistance and fault voltage [27], [28]. Hong et al. [29] applied the improved entropy method to capture over-voltage faults in actual EVS.

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To enhance the identification of abnormal battery cells, the investigation opted to use the NCOV with a sliding step of 10 and a computational window of 15 to visualize the outcomes. ... the battery Cell 9 voltage returns to normal, while the voltage in Cells 2 and 6 begin to occur outliers. Finally, in the 41st cycle, stage I is constant ...

The battery cell voltage data of these two types of vehicles are input into the IF model for scoring calculation. ... 4.3 Abnormal battery cell identification. After ...

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