Lithium battery residual current detection

Why is residual generation used for fault detection in a battery cell?
The residual generation is commonly applied for fault detection in a battery cell. The rationale behind this is that a battery pack typically comprises numerous battery cells. Estimating the state of each cell inevitably increases computation complexity and hinders timely fault detection. Table 8.

How to diagnose lithium-ion battery fault?
To enhance the reliability and safety of lithium-ion batteries, many scholars have proposed different methods for lithium-ion battery fault diagnosis. Current fault diagnosis methods can be divided into three categories: experience-based methods, model-based methods, and data-driven methods [5, 8, 9].

Can lithium-ion battery fault diagnose EV based on real-time voltage?
In this paper,the novel method for lithium-ion battery fault diagnosis of EV based on real-time voltage is presented. The effectivenessof the method is verified based on the real-time data collected by EVs. The related conclusions are drawn as follows:

Can lithium-ion batteries be faulted based on real-time voltage?
The cell faults of lithium-ion batteries will lead to the atypical deterioration of battery performance and even thermal runaway. In this paper, a novel fault diagnosis method for lithium-ion batteries of electric vehicles based on real-time voltage is proposed.

Can kurtosis detect faults in lithium-ion batteries of electric vehicles?
In this paper,a novel fault diagnosis method for lithium-ion batteries of electric vehicles based on real-time voltage is proposed. Firstly,the voltage distribution of battery cells is confirmed in electric vehicles,and the reasons are analyzed. Furthermore,kurtosis is utilized to discover cell faults for the first time.

Can a lithium-ion battery detect early internal short circuit cells?
Kong et al. developed an electrochemical modelfor lithium-ion batteries to detect early internal short circuit cells. The advantage of the model-based method is that the model mechanism is clear and easy to modify.

This paper provides a comprehensive review of various fault diagnostic algorithms, including model-based and non-model-based methods. The advantages and disadvantages of the reviewed algorithms, as well as some future challenges for Li-ion battery fault diagnosis, are also discussed in this paper.

He, H. Fault Detection and Isolation for Lithium-Ion Battery System Using Structural Analysis and Sequential Residual Generation. In Proceedings of the ASME 7th annual dynamic systems and control conference 2014, San Antonio, TX, USA, 22-24 October 2014.

The proposed current sensor fault detector comprises the nonlinear battery cell model, the Luenberger-type

state estimator, and a disturbance observer-based current ...

Multi-fault Detection and Isolation for Lithium-Ion Battery Systems Abstract: Various faults in the lithium-ion battery system pose a threat to the performance and safety of the battery. However, early faults are difficult to detect, and false alarms occasionally occur due to similar features of the faults. In this article, an online multifault diagnosis strategy based on the fusion of model ...

practical solution to detect and isolate all potential faults in the Li-ion battery system. There are several challenges in Li-ion battery fault diagnosis, including assumption-free fault...

According to the residual between the estimated and measured load current, the current sensor fault can be timely detected. Yang et al. [149] implemented SC fault detection via the difference between the estimated SOCs by the EKF and those computed by a Coulomb counting method.

Therefore, accurate early detection of lithium-ion battery fault is imperative to guarantee the battery performance. Motivated by this fact, we proposed a real time fault ...

Abstract: Current sensor fault diagnostic is critical to the safety of lithium-ion batteries (LIBs) to prevent over-charging and over-discharging. Motivated by this, this article proposes a novel residual statistics-based diagnostic method to detect two typical types of sensor faults, leveraging only the 50 current-voltage samples at the ...

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The model-based method establishes the mathematical or chemical model of lithium-ion batteries. Residual signals are obtained to detect and identify faults by comparing measurable signals from the model outputs .

In this paper, a fault diagnosis method based on relative entropy and state of charge (SOC) estimation is proposed to detect fault in lithium-ion batteries. First, the relative entropies of the voltage, temperature and SOC of battery cells are calculated by using a sliding window, and the cumulative sum (CUSUM) test is adopted to achieve fault ...

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Here, we develop a realistic deep-learning framework for electric vehicle (EV) LiB anomaly detection. It features a dynamical autoencoder tailored for dynamical systems ...

DOI: 10.1016/J.EST.2021.102740 Corpus ID: 236238412; Model-based thermal anomaly detection for lithium-ion batteries using multiple-model residual generation @article{Dong2021ModelbasedTA,

title={Model-based thermal anomaly detection for lithium-ion batteries using multiple-model residual generation}, author={Guangzhong Dong and ...

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By detecting and analyzing this residual, the method can identify the existence, type, and location of faults. Given the inherent nonlinearity and uncertainty of battery systems, sliding mode strategies and their variants have been widely used in research to support battery fault diagnosis. Xu et al. (2024b) proposed a multi-objective nonlinear fault detection observer for lithium-ion ...

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