Detection and repair of lithium battery packs

Can a lithium-ion battery pack detect a single occurrence of a fault?

This paper presents a method of detecting a single occurrence of various common faults in a Lithium-ion battery pack and isolating the fault to the faulty PCM, its connecting conductors, and joints, or to the sensor in the pack using a Diagnostic Automata of configurable Equivalent Cell Diagnosers.

Is there a fault warning algorithm for electric vehicle lithium-ion battery packs?

Based on the voltage data,this paper develops a fault warning algorithmfor electric vehicle lithium-ion battery packs based on K-means and the Fréchet algorithm. And the actual collected EV driving data are used to verify.

What is a fault diagnosis model for lithium-ion batteries?

The principal component analysis method was used first to estimate the fault information. Then a developed cross-cell monitoring algorithm was used to carry out the fault diagnosis. Jiang et al. (2021) proposed a new signal-basedfault diagnosis model for lithium-ion batteries.

What is a diagnostic algorithm for lithium ion battery packs?

Diagnostic algorithm is executed on a microcontroller and tested in real-time. Lithium-ion battery packs are typically built as a series network of Parallel Cell Modules (PCM). A fault can occur within a specific cell of a PCM,in the sensors,or the numerous connection joints and bus conductors.

How can faults detection and abnormality of battery pack be detected?

As discussed above,the faults diagnosis and abnormality of battery pack can be detected in real time. In addition,timely detection and positioning of faults and defects of cells can improve the health and safety of the whole battery pack.

Can RBF neural networks detect faults in lithium-ion battery packs?

The diagnosis test results showed that the improved RBF neural networks could effectively identify the fault diagnosis information of the lithium-ion battery packs,and the diagnosis accuracy was about 100%. With the increasing attractiveness of new energy vehicles,the safety of the electric vehicle battery is crucial.

The motivations of achieving carbon peak and carbon neutrality have accelerated the continuous development of electric vehicles (EVs) [1, 2].Lithium-ion batteries (LIBs) as a reliable and promising power source, with the advantages of high power density and long cycling life, are widely used in EVs [3, 4].However, due to manufacturing defects, various types of ...

This paper presents a fault diagnosis method for the electric vehicle power battery using the improved radial basis function (RBF) neural network. First, the fault information of lithium-ion battery packs was collected ...

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Voltage fault detection for lithium-ion battery pack using local outlier factor. Measurement (2019) B. Xia et al. A fault-tolerant voltage measurement method for series connected battery packs. J Power Sources (2016) Y. Kang et al.

Highlights A novel fault diagnosis algorithm for eVTOL battery packs was presented. The algorithm was developed to work during the charge cycle, thus minimising ...

Therefore, we construct a fault detection model with the DBSCAN algorithm to achieve accurate detection of MSC cells within lithium-ion battery packs. Specifically, we use the first two principal components of the IC curves obtained in Section 2.2 as classification features, which are input into the DBSCAN algorithm to detect MSC cells.

ISCs in lithium-ion batteries are usually triggered by mechanical, electrical, and thermal abuses [7].Mechanical abuse, such as collision, extrusion, or punctures, can damage the battery structure and cause the battery to suffer severe deformation, which in turn may lead to an electrical connection between the positive and negative electrodes and thus trigger a short ...

A control-oriented lithium-ion battery pack model for plug-in hybrid electric vehicle cycle-life studies and system design with consideration of health management. J Power Sources 2015; 279: 791 ... Zhang M, et al. Internal short circuit detection for lithium-ion battery pack with parallel-series hybrid connections. J Clean Prod 2020; 255:

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There are many approaches being used to improve the reliability of lithium-ion battery packs (LIBPs). Among them, fault-tolerant technology based on redundant design is an effective method [4, 5].At the same time, redundant design is accompanied by changes in the structure and layout, which will affect the reliability of battery packs.

The authors utilized an observer based on an electrochemical model and a fuzzy logic algorithm that can be implemented in real time. A battery internal fault diagnosis ...

This study investigates a novel fault diagnosis and abnormality detection method for battery packs of electric scooters based on statistical distribution of operation data that are ...

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