research on battery defect detection. Research shows that most of the current research are mainly aimed at lithium-ion batteries.4-6 Although some scholars have conducted research on defect detection of thermal batteries, the research on intelligent detection of different types of defects in thermal batteries is relatively weak.

The solution of defect detection system is illustrated in Fig. 1 to recognize surface defects. Our system began with obtaining the depth image by the structured light system; and as a result, the 3D point cloud model is obtained by the depth image (Fig. 1a), followed by the calculation of the model that filter the point cloud data (Fig. 1b), and then ...

For the traditional algorithm to detect lithium battery defects, the missing rate is high and the speed is slow, an improved YOLOv7 algorithm was proposed. Firstly, CBAM attention mechanism is added to feature extraction part, which can enhance network"s representation ability. Secondly, in the feature fusion part, ConvNeXt lightweight module was ...

In this study, we aimed to address the primary challenges encountered in industrial integrated circuit (IC) surface defect detection, particularly focusing on the imbalance in information density arising from difficulties in data sample collection. To this end, we have developed a new hybrid architecture model for IC surface defect detection (SDDM), based on ...

During the manufacturing of lithium-ion battery electrodes, it is difficult to prevent certain types of defects, which affect the overall battery performance and lifespan. Deep learning computer vision methods were used to evaluate the quality of lithium-ion battery electrode for automated detection of microstructural defects from light microscopy images of the sectioned ...

Surface defects of lithium batteries seriously affect the product quality and may lead to safety risks. In order to accurately identify the surface defects of lithium battery, a novel defect detection approach is proposed based on improved K-nearest neighbor (KNN) and Euclidean clustering segmentation. Firstly, an improved voxel density strategy for KNN is proposed to ...

A Fast Regularity Measure for Surface Defect Detection, Machine Vision and Applications 23(5) (2012), 869-886 ... The prediction of discharge capacity of lithium batteries was one of the main tasks of battery management system. The discharge capacity of lithium batteries was related with many parameters, including discharge current, voltage ...

The advisory firm has compiled factory quality audit data on 64% of tier one lithium-ion battery energy storage system manufacturers over the past six years, identifying more than 1,300 ...

In this paper, the current research progress and future prospect of lithium battery fault diagnosis technology

are reviewed. Firstly, this paper describes the fault types ...

Sliding mode observers in a model-based diagnostic system create various defect detection filter expressions for identifying, isolating, and estimating defects in voltage, current, and temperature sensors. ... This paper thoroughly examines the existing issues in battery technique systems detection. It distinguishes between model-based fault ...

This work proposes a novel data-driven method to detect long-term latent fault and abnormality for electric vehicles (EVs) based on real-world operation data. Specifically, the ...

This story was updated at 5:14 p.m. EST. More than a quarter of grid battery systems may be at risk of fires because of defects in the manufacturing process, according to a six-year global audit ...

The review covers various defect types, including manufacturing, operational, and environmental defects, and discusses the methodologies used for defect detection, including their...

Flat panel CT detection is based on the principle of projection amplification, resulting in a decrease in sample resolution as its size increases. 25 To enhance image resolution, two common approaches are reducing x-ray focus and/or employing a higher resolution flat-panel detector. 26 However, these methods do not overcome the limitations of ...

This paper presents an automatic flaw inspection scheme for online real-time detection of the defects on the surface of lithium-ion battery electrode (LIBE) in actual industrial production. Firstly, based on the conventional methods of region extraction, ROI (region of LIBE) could be extracted from the captured LIBE original image. Secondly, in order to reduce the influences of ...

detection algorithm and a multi-step classifier, can help ensure that battery producers can distinguish non-quality-related optical effects from defects in battery production. The world leader in automated online surface inspection solutions, AMETEK Surface Vision offers a broad product range optimized for the monitoring and

This paper consolidates various internal and external battery faults and their detection techniques executed on the battery management system. The fault detection techniques are ...

"Advanced, phased array SAM systems make it possible for battery manufacturers to move to a higher level of failure analysis because of the level of detection and precision involved," said Polu. "In the past, detecting a 500-micron defect was the goal; now it is a 50-micron defect.

The automated defect detection system for ceramic pieces operates in real time and achieves impressive performance results. It has a testing accuracy of 98.00% and an F1-score of 97.29%, as evidenced in Table 2. The FT method enhances system performance, with the ResNet model demonstrating superior performance to

other tested models. ...

To address the surface defect detection in the battery current collector of electric vehicles, an improved target detection algorithm called DCS-YOLO based on YOLOv5 ...

A significant amount of research has been conducted on fault diagnosis for battery systems. There are three main categories of fault diagnosis methods: knowledge-based methods, model-based methods, and data-driven methods. ... the current power battery defect detection is mostly based on equipment testing after production and recall, which does ...

DOI: 10.1007/s10845-019-01484-x Corpus ID: 201239143; Image-based defect detection in lithium-ion battery electrode using convolutional neural networks @article{Badmos2019ImagebasedDD, title={Image-based defect detection in lithium-ion battery electrode using convolutional neural networks}, author={Olatomiwa Badmos and Andreas ...

To ensure safe and efficient battery operations and to enable timely battery system maintenance, accurate and reliable detection and diagnosis of battery faults are ...

A new method called local gravitation outlier detection spots tiny voltage dips in lithium-ion batteries, allowing for earlier fault detection in battery systems. The goal is to ...

Early and effective surface defect detection in industrial components can avoid the occurrence of serious safety hazards. ... In 2014 Fifth International Conference on Intelligent Systems Design ...

The future trend in global automobile development is electrification, and the current collector is an essential component of the battery in new energy vehicles. Aiming at the misjudgment and omission caused by the confusing distribution, a wide range of sizes and types, and ambiguity of target defects in current collectors, an improved target detection model DCS ...

achieves a defect detection accuracy of 99.2% and an a verage data processing time of 35.3 milliseconds, highlighting its suitability for industrial applications in lithium battery pro-

The battery system, as the core energy storage device of new energy vehicles, faces increasing safety issues and threats. An accurate and robust fault diagnosis technique is crucial to guarantee the safe, reliable, and ...

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