

This publication reviews current methods to automate the EVB disassembly process to define the current level of autonomy and find the gaps and challenges in robotised disassembly, testing and sorting tasks of the EVB.

Energy Storage is a new journal for innovative energy storage research, covering ranging storage methods and their integration with conventional & renewable systems. ... Recommended solutions based on intelligent robotics for safe and efficient disassembly, residual energy detection, and secondary utilization ... The main recycling process was ...

Coupling of the multiscale models: building machine models interconnected to the process models, with the aim to depict the machining process as realistically as possible and to display the relevant process characteristics in local resolution, to describe the physical and technological phenomena over the whole process.

In the context of current societal challenges, such as climate neutrality, industry digitization, and circular economy, this paper addresses the importance of improving recycling practices for electric vehicle (EV) battery packs, with a specific focus on lithium-ion batteries (LIBs). To achieve this, the paper conducts a systematic review (using Google Scholar, ...

Lithium-ion batteries (LIB) are the mainstay of power supplies in various mobile electronic devices and energy storage systems because of their superior performance and long-term rechargeability [1] recent years, with growing concerns regarding fossil energy reserves and global warming, governments and companies have vigorously implemented replacing oil ...

Various studies show that electrification, integrated into a circular economy, is crucial to reach sustainable mobility solutions. In this context, the circular use of electric vehicle batteries (EVBs) is particularly relevant because of the resource intensity during manufacturing. After reaching the end-of-life phase, EVBs can be subjected to various circular economy strategies, all of which ...

The International Renewable Energy Agency predicts that with current national policies, targets and energy plans, global renewable energy shares are expected to reach 36% and 3400 GWh of stationary energy storage by 2050. However, IRENA Energy Transformation Scenario forecasts that these targets should be at 61% and 9000 GWh to achieve net zero ...

This is significant for ensuring safe disassembly. First, the disassembly activities and interactions of humans and robots can be monitored in a real-time way to avoid any harm from the robotic system to the humans. Second, all the disassembly equipment conditions and process information can be fused to make

comprehensive risk assessments.

It helped to consider the comprehensive recycling profit of the entire disassembly process of a spent product. Tang et al. [63] Developed a fuzzy attribution PN model to mathematically express disassembly uncertainties arising from human interventions. It considered the influence of different operators on the disassembly process. Mao et al. [64]

With the growing requirements of retired electric vehicles (EVs), the recycling of EV batteries is being paid more and more attention to regarding its disassembly and echelon utilization to reach highly efficient resource utilization and environmental protection. In order to make full use of the retired EV batteries, we here discuss various possible application methods ...

Lithium-ion batteries are the state-of-the-art electrochem. energy storage technol. for mobile electronic devices and elec. vehicles. ... A techno-economic assessment of the impact of battery pack design on disassembly costs. Applied Energy 2023, 331, 120437. ... Greenhouse gas emission benefits of adopting new energy vehicles in Suzhou City ...

Energy Storage . Energy storage is a widespread subject of interest to scientists, engineers, technologists, and industrial professionals worldwide. Numerous research works have been reported on energy storage and methodologies in past literature.

This report describes a developed disassembly information model. It is an integrated information with the following key components: feature, tolerance, workpiece material, equipment, and ...

2020, Energy Storage. ... Fig. 1 shows China's new energy vehicle (battery electric vehicles and plug-in hybrid electric vehicles) sales in 2016-2018 [6]. The recycling process comprises of mechanical process and chemical process. ... For example, in order to solve some problems of high process complexity in the disassembly process, the ...

Researchers at the Department of Energy's Oak Ridge National Laboratory have developed a robotic disassembly system for spent electric vehicle battery packs to safely ...

3.7se of Energy Storage Systems for Peak Shaving U 32 3.8se of Energy Storage Systems for Load Leveling U 33 3.9ogrid on Jeju Island, Republic of Korea Micr 34 4.1rice Outlook for Various Energy Storage Systems and Technologies P 35 4.2 Magnified Photos of Fires in Cells, Cell Strings, Modules, and Energy Storage Systems 40

The analysis highlights that a complete automatic disassembly remains difficult, while human-robot collaborative disassembly guarantees high flexibility and productivity. The paper introduces guidelines for designing a ...

new model of disassembly process for remanufacturing is developed. Current studies only consider disassembly as a physical activity to break down products into components. In the new model, disassembly is viewed as a process that converts into output, which consist of ...

An energy-storage system comprised of lithium-ion battery modules is considered to be a core component of new energy vehicles, as it provides the main power source for the transmission system.

Up to 70% of the original capacity of a used battery can be integrated into a new energy storage system 127. Current and future national and global initiatives may be focused on environmental ...

New Jersey, United States,- The Power Battery Disassembly Equipment Market refers to a specialized sector within the broader battery recycling industry, focusing on the disassembly and processing ...

Hartono et al. proposed a method to optimize robot disassembly plans using a bee algorithm to maximize profits, save energy, reduce the environmental impact, and achieve ...

Disassembly sequence planning (DSP) is a key approach for optimizing various industrial equipment-maintenance processes. Finding fast and effective DSP solutions plays an important role in improving maintenance efficiency and quality. However, when disassembling industrial equipment, there are many uncertainties that can have a detrimental impact on the ...

Disassembly plays a pivotal role in the maintenance of industrial equipment. However, the intricate nature of industrial machinery and the effects of wear and tear introduce inherent uncertainty into the disassembly process. The inadequacy in representing this uncertainty within equipment maintenance disassembly has posed an ongoing challenge in ...

Lithium-ion batteries (LIBs) with relatively high energy density and power density are considered an important energy source for new energy vehicles (NEVs). However, LIBs are highly sensitive to temperature, which makes their thermal management challenging. Developing a high-performance battery thermal management system (BTMS) is crucial for the battery to ...

Second, the disassembly process of battery packs is complex due to the variety and intricate interconnections of components, making it labour intensive and energy consuming 61.

1 INTRODUCTION 1.1 The current status of lithium-ion battery (LIB) waste and metal supply-demand scenario. Increasing global energy demands and environmental devastation 1, 2 have fueled the development of green technology and energy storage devices. With their high efficiency, better power density, extended durability, and compact size, LIBs have evolved into ...

This paper discusses the future possibility of echelon utilization and disassembly in retired EV battery recycling from disassembly optimization and human-robot collaboration, ...

Based on the current situation of the comprehensive utilization industry of new energy vehicle traction battery, this paper compares the traction battery technology profile and its key ...

Dismantling the waste printed circuit boards (WPCBs) of obsolete mobile phones is essential for resource recycling and environmental protection. An automated WPCB disassembly equipment based on the hot-vibration process was designed and applied, with optimized process conditions of a heating temperature of 250 °C and an ...

This work examines the key advances and research opportunities of emerging intelligent technologies for EV-LIB disassembly, and recycling and reuse of industrial products ...

Retired electric-vehicle lithium-ion battery (EV-LIB) packs pose severe environmental hazards. Efficient recovery of these spent batteries is a significant way to achieve closed-loop lifecycle management and a green circular economy. It is crucial for carbon neutralization, and for coping with the environmental and resource challenges associated with ...

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