



# Lithium battery private disassembly

This paper analyses the use of robotics for EVs" battery pack disassembly to enable the extraction of the battery modules preserving their integrity for further reuse or recycling. The analysis highlights that a complete ...

An effective lithium-ion battery (LIB) recycling infrastructure is of great importance to alleviate the concerns over the disposal of waste LIBs and the sustainability of critical elements for producing LIB components. The End-of-life (EOL) LIBs are in various sizes and shapes, which create significant challenges to automate a few unit operations (e.g., ...

This paper presents a method for 3D camera-based localization of points on deformed battery modules, aiding in identifying support points for milling operations in robot-assisted disassembly cells and demonstrates that a balance between accuracy and computational speed can be attained by adjusting point density. Automated robot-assisted disassembly is ...

Abstract. Electric vehicle production is subjected to high manufacturing cost and environmental impact. Disassembling and remanufacturing the lithium-ion power packs can highly promote electric vehicle market penetration by procuring and regrouping reusable modules as stationary energy storage devices and cut life-cycle cost and environmental impact. ...

Design for Assembly and Disassembly of Battery Packs A collaboration between Chalmers University of Technology and Volvo Group Trucks Technology M. COLLIJN, E. JOHANSSON ... LIB Lithium-Ion Batteries LFP Lithium Iron Phosphate LV Low Voltage m Meter MSD Manual Service Disconnect NCA Lithium Nickel Cobalt Aluminum ...

Electric vehicles (EVs) have been experiencing radical growth to embrace the ambitious targets of decarbonisation and circular economies. The trend has led to a significant ...

A flexible gripper system is presented in detail to show how the disassembly process can be supported by automation and the control architecture and the integrated functionalities, such as voltage or resistance measurement, are described. The integration of lithium ion battery technology in the automotive sector has increased enormously during the last years. ...

Visual-triggered contextual guidance for lithium battery disassembly: a multi-modal event knowledge graph approach Journal of Engineering Design ( IF 2.7) Pub Date : 2024-01-16, DOI: 10.1080/09544828.2024. ...

Review--Post-Mortem Analysis of Aged Lithium-Ion Batteries: Disassembly Methodology and Physico-Chemical Analysis Techniques August 2016 Journal of The Electrochemical Society 163(10):A2149-A2164



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DOI: 10.1080/09544828.2024.2301876 Corpus ID: 267021460; Visual-triggered contextual guidance for lithium battery disassembly: a multi-modal event knowledge graph approach @article{Zheng2024VisualtriggeredCG, title={Visual-triggered contextual guidance for lithium battery disassembly: a multi-modal event knowledge graph approach}, author={Hangbin Zheng ...

To facilitate construction analysis, failure analysis, and research in lithium-ion battery technology, a high quality methodology for battery disassembly is needed. This paper presents a methodology for battery disassembly that considers key factors based on the nature and purpose of post-disassembly analysis. The methodology involves upfront consideration of ...

A novel disassembly process of end-of-life lithium-ion batteries enhanced by online sensing and machine learning techniques J Intell Manuf . 2023;34(5):2463-2475. doi: 10.1007/s10845-022-01936-x.

The success of lithium-ion batteries (LIBs) in battery-powered applications has lead to intensive efforts towards maximizing their efficiency as an energy source. In the case of battery electric vehicles (BEVs), it constitutes the most expensive component [1], which is why optimized design and operation of battery systems is of high importance.

With the staggering development of the market for electric mobility, the demand for batteries will rapidly increase, as illustrated in Figure 1a. This leads to a correspondingly growing requirement of the major primary raw minerals (recognized as lithium, graphite, nickel, manganese, and cobalt) for production, as outlined in Figure 1b. However, despite the ...

Batteries 2023, 9, 297 2 of 25 the widespread utilization of LIBs, the raw minerals are mined and processed in very few countries globally, as mining resources are known to be limited.

It is imperative to develop automatic disassembly solution to effectively disassemble the LIBs while safeguarding human workers against the hazards environment. In ...

2. Procedure in the Disassembly of Battery Packs The following section shows the legal framework in the recycling of lithium-ion-batteries. Furthermore, the process of disassembly and disposal of battery fractions is presented. Based on this, the challenges for

To realize an automated disassembly of battery pack components, a computer vision pipeline is proposed and the approach of instance segmentation and point cloud registration is applied and validated within a demonstrator grasping busbars from the battery pack. A large number of battery pack returns from electric vehicles (EV) is expected for the next ...

Direct methods, where the cathode material is removed for reuse or reconditioning, require disassembly of LIB to yield useful battery materials, while methods to renovate used batteries into new ones are also ...



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With the explosion of waste PBs, a brilliant disassembly sequence has a good prospect of solving the low efficiency of PBs disassembly problem [11]. The purpose of disassembly task sequence planning (DTSP) [7] is to plan a systematic disassembly process according to certain information and rules, then remove the parts in sequence under the ...

EXTRACTION AND RECYCLING OF BATTERY MATERIALS Disassembly Automation for Recycling End-of-Life Lithium-Ion Pouch Cells LIURUI LI,<sup>1</sup> PANNI ZHENG,<sup>1</sup> TAIRAN YANG,<sup>1</sup> ROBERT STURGES,<sup>1</sup> MICHAEL W. ELLIS,<sup>1</sup> and ZHENG LI <sup>1,2</sup> 2.--e-mail

Review--Post-Mortem Analysis of Aged Lithium-Ion Batteries: Disassembly Methodology and Physico-Chemical Analysis Techniques, Thomas Waldmann, Amaia Iturrondobeitia, Michael Kasper, Niloofar Ghanbari, Fr&#233;d&#233;ric Aguesse, Emilie Bekaert, Lise Daniel ...

Manual disassembly of the lithium-ion battery (LIB) modules of electric vehicles (EVs) for recycling is time-consuming, expensive, and dangerous for technicians or workers. Dangers associated with ...

A large number of battery pack returns from electric vehicles (EV) is expected for the next years, which requires economically efficient disassembly capacities. This cannot be met through purely manual processing ...

If correctly sorted and identified before material recovery, the process becomes easier to control, and more affordable to perform separation. 3.2 Disassembly Battery disassembly is required for large scale batteries to remove durable casings and fixtures adjoined to the exterior to collect materials unable to be recycled using other processes.

The LithoRec process also provides for manual disassembly activities that go beyond the classic dismantling scope to disassemble the battery pack housing, the battery management system (BMS), the wiring harness, and ...

Abstract. Recycling plays a crucial role in achieving a sustainable production chain for lithium-ion batteries (LIBs), as it reduces the demand for primary mineral resources ...

The process exposes battery terminals to cyclic voltage changes, to analyse settling times between initial state and desired loads. Settling time for NiMH batteries is faster ...

Semantic Scholar extracted view of &quot;A new heuristic algorithm based on multi-criteria resilience assessment of human-robot collaboration disassembly for supporting spent lithium-ion battery recycling&quot; by Gang Yuan et al. DOI: 10.1016/j.engappai.2023.106878

Semantic Scholar extracted view of &quot;To shred or to disassemble - A techno-economic assessment of automated disassembly vs. shredding in lithium-ion battery module recycling&quot; by Martin Choux et al.



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DOI: 10.1016/j.resconrec.2024.107430 Corpus ID: 267233881 ...

A key challenge in lithium-ion battery research is the need for more transparency regarding the cell design and production processes of battery as well as vehicle ...

For the purpose of these guidelines, shipping refers to sending lithium-ion batteries to off-campus destinations using a private carrier. Lithium-ion batteries should never be sent by regular US Mail. Shipping lithium-ion batteries is heavily regulated. Improper shipping may result in significant violations as well as catastrophic accidents.

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