Battery automatic disassembly system principle

This chapter presents the principle of disassembly automation, as well as the basic elements needed in a disassembly system. ... Deactivation / Discharging of the battery o Disassembly of ...

The new method carries out automatic disassembly of electric car batteries using robots with fine-tuned gripping arms. The robot is in turn controlled by an advanced 3D camera with artificial intelligence.

The automatic braking system works to reduce the chance of a crash, as well as reduce the severity of a collision if it occurs. Automatic braking systems are called different things, but the concept is the same. Technically, the concept is two systems working together: forward collision warning and automatic breaking. Forward Collision Warning ...

A battery disassembly time comparison between manual and automatic disassembly of a small single module battery is proposed in a study by Zhou et al. [28], which highlights the large percentage of ...

As a matter of fact, multi-arm systems developed in industrial contexts have been used mainly to execute tasks not viable [13-15], or even impossible [16], for single-arm systems. In [13] an automatic disassembly workcell--composed of two manipulators, a rotating table, a tool changer and a deposit zone--is described; the disassembly task ...

DOI: 10.1016/J NENGPRAC.2008.05.013 Corpus ID: 109225226; Automatic cooperative disassembly robotic system: Task planner to distribute tasks among robots @article{Torres2009AutomaticCD, title={Automatic cooperative disassembly robotic system: Task planner to distribute tasks among robots}, author={Fernando Torres and Santiago Puente ...

An automatic voltage stabilizer is working as a safeguard for electric appliances. Its key job is to regulate the voltage supplied to appliances and keep a steady voltage, no matter if the input voltage is fluctuating. Stabilizing the power stops our gadgets from getting damaged when the voltage is too high or too low, keeping them safe.

The current pre-programmed disassembly conducted by the Autonomous Mobile Manipulator Robot(AMMR) struggles to meet the disassembly requirements in dynamic environments, ...

Therefore, even a bespoke automated disassembly system may fail if it cannot deal with various uncertain circumstances (Chen et al., 2021). The autonomous disassembly system is expected to have high flexibility, adaptiveness, and perceptual capability in all the disassembly processes to recognize and handle various scenarios.

Disassembly technologies for end-of-life LIBs are reviewed, mainly including disassembly sequencing,

manual experimental disassembly, and automatic disassembly ...

As shown in Fig. 2, the main challenges can be divided into three parts: automatic disassemble process, SOH Accepted Article detection and remaining useful life prediction, and retired battery secondary utilization. 2.1 Dismantling process Due to the inflammable and explosive substances in the battery, the external force is needed to decompose ...

The developed framework is scalable and will underpin future research incorporating other tools and operations to deal with the complexity of existing EV battery packs. Work will be continued and transferred to real end-of-life battery packs on a new, bespoke battery assembly/disassembly cell currently being designed by MTC.

An automatic disassembly system for smartphones was developed. It consisted of the following four processes: (i) freezing to disable battery adhesive, (ii) X-ray scanning and computational analysis using deep learning to detect the position of the battery and screws, (iii) press cutting to create weakness to disable the screws without damaging ...

By Allison Proffitt . August 23, 2021 | 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 and efficiently recycle and reuse critical materials while reducing toxic waste.. With the anticipated growth in EVs over the next two decades comes the issue of ...

Disassembly of e-waste has received significant attention over the past decades to extract value-added parts or components for recovery or reuse. It is imperative to develop automatic disassembly to replace human workers thus safeguarding them against the hazardous environment. Most scholars investigate the disassembly of e-waste from a ...

These agent-based systems follow the principle of distributed system parts (agents) complementing each other to a system fulfilling the requirements for the required task. ... by employing AI strategies will also ...

However, developing an automatic high-speed disassembly system faces three difficulties: detaching the batteries secured with adhesive, the differences in the internal structures of smartphones with respect to manufacturers and types, and the need for preferential breakage that disables the screws without damaging the battery.

As shown in Fig. 2, the main challenges can be divided into three parts: automatic disassemble process, SOH Accepted Article detection and remaining useful life prediction, and retired battery secondary utilization. 2.1 Dismantling ...

Robotic disassembly systems are assessed based on levels of automation and uncertainties present in

end-of-life products which are addressed. The results demonstrate that there is a compromise between increasing levels of automation of a disassembly system and its ability to address uncertainties throughout the disassembly process.

This review examines the robotic disassembly of electric vehicle batteries, a critical concern as the adoption of electric vehicles increases worldwide. This work provides a comprehensive overview of the current state of the art in robotic disassembly and outlines ...

The measurement and automatic correction of the position and orientation of the ... 3.2 Handling Principles in Battery Cell Assembly. A handling system consists of connected modules, e.g. an automated movement system, a gripper, and peripherals. ... The characteristics of the new materials are also challenging in the usually manual production ...

In order to solve the problem that the new energy power battery system was mainly manually disassembled, and the robot could not complete the disassembly alone, a method based on human-machine cooperative disassembly sequence planning was proposed. First, according to the connection relationship between the parts and the priority constraint relationship, a product ...

Overview of the closed-loop battery life cycle with disassembly as the central branching point for the 3R paths. tt tt The disassembly of battery systems is a particularly relevant process in ...

Whether a recycler simply wants to get through the outer housing to access batteries and replace worn components, or completely recycle battery stacks for recovery of cobalt, lithium, metal foils and other materials, the first step is battery diagnostics for safe and efficient handling and disassembly. "With our system, when the robot picks up ...

The efficient disassembly of end-of-life electric vehicle batteries(EOL-EVBs) is crucial for green manufacturing and sustainable development. The current pre-programmed disassembly conducted by ...

With the increasing popularity of electric vehicles, the number of end-of-life (EOF) electric vehicle batteries (EVBs) is also increasing day by day. Efficient dismantling and recycling of EVBs are essential to ensure environmental protection. There are many types of EVBs with complex structures, and the current automatic dismantling line is immature and ...

These agent-based systems follow the principle of distributed system parts (agents) complementing each other to a system fulfilling the requirements for the required task. ... by employing AI strategies will also benefit the feasibility of automatic robotic disassembly. The method utilized also depicts future potential for research regarding ...

Flexible multisensorial systems are a very important issue in the current industry when disassembling and

recycling tasks have to be performed. These tasks can be performed by a human operator or by a robot system. In the current paper a robotic system to perform the required tasks is presented. This system takes into consideration the distribution ...

battery disassembly system has great potential to ensure the automatic separation of polymer-lami-nated aluminum films, separators, cathode sheets, and anode sheets with well-preserved integrity. Before being fed into the disassembly system, EOL Fig. 1. Configuration of a pouch LIB. Fig. 2. Continuous process for recovery of cathode coating from

Efficient processing of end-of-life lithium-ion batteries in electric vehicles is an important and pressing challenge in a circular economy. Regardless of whether the processing strategy is recycling, repurposing, or remanufacturing, the first processing step will usually involve disassembly. As battery disassembly is a dangerous task, efforts have been made to ...

The module system functioned as a battery charge controller, continuously maintaining a full charge of 12 volts and setting the charging system higher than the volt level in the battery [51].

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 and, therefore, needs to be automated. The variance of different battery pack designs in terms of (non-) solvable fitting technology and superstructures ...

An automatic voltage stabilizer is working as a safeguard for electric appliances. Its key job is to regulate the voltage supplied to appliances and keep a steady voltage, no matter if the input voltage is fluctuating. Stabilizing the power stops ...

The developed architecture deals with the variation found in end-of-life vehicle battery packs and will underpin future research in battery pack disassembly. Developing ...