I3-MYDAS

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ADVANCED TECHNOLOGIES FOR BATTERY LIFECYCLE MANAGEMENT

State of Health Estimation on Electric Vehicle Batteries

The estimation of the state of health (SOH) of automotive batteries is a critical factor in assessing their viability for second-life applications, such as energy storage and vehicle-to-grid (V2G) technologies.

As electric vehicles transition to their second life, the ability to accurately estimate SOH becomes paramount to ensure reliability, safety, and optimal performance in new roles. Challenges in SOH estimation stem from various factors including data collection, model adaptability, algorithm complexity, and the unique characteristics of different battery chemistries, which collectively hinder effective assessments and integration into battery management systems.

Data collection remains a fundamental challenge, as accurate SOH estimation relies on multiple health indicators influenced by battery age, temperature, and operational cycles.

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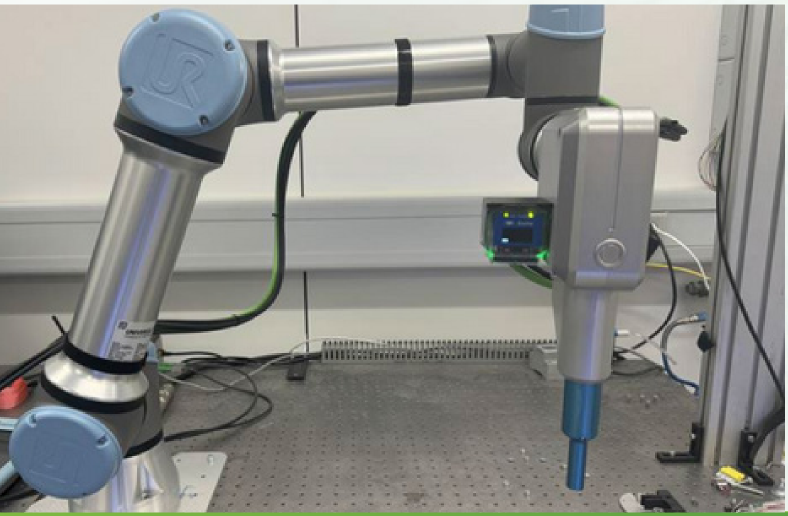
Disassembly of Electric Vehicle Batteries

The automation of the disassembly process for batteries within the automotive supply chain is emerging as a critical innovation in response to the growing demand for electric vehicles and the imperative for sustainable practices in battery recycling.
As the automotive industry pivots towards electric mobility, the necessity for efficient disassembly methods to recover valuable materials from retired lithium-ion batteries (LIBs) has gained prominence.



Traditional manual disassembly techniques have proven to be labour-intensive, inefficient, and hazardous, highlighting the urgent need for automated solutions that enhance operational efficiency and safety in handling toxic materials.

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FLENDER continues development project in R3-MYDAS project to exploit state-of-the-art remanufacturing technologies for high torque density journal bearing gearboxes

Flender, leveraging over 40 years of experience in wind turbine drivetrain solutions, is developing a dynamic tester as part of the R3-Mydas project. A key objective is to explore new remanufacturing methods that could deliver both environmental and cost benefits to the wind energy industry.

In 2024, three phases of testing were planned. The first phase—building and commissioning the dynamic tester—was successfully completed by May. The second phase focused on testing first-generation wind turbine journal bearings under demanding conditions, including material fatigue and component failure. Positive early results led to an extension of this phase, adding tests such as dynamic behavior analysis and further load testing. These tests are ongoing and expected to wrap up by mid-2025. The third phase, involving next-generation journal bearings, is now scheduled to begin in the second half of 2025.

Following these tests, damaged components will be remanufactured using advanced repair techniques and retested to benchmark their performance against new components. This comparison will help evaluate potential savings in materials, reduced lead times, and lower repair costs.

The remanufacturing process design has been completed, and testing is planned for late 2025. In parallel, Flender is also testing new coating solutions for journal bearings.

Two coating technologies are being evaluated under harsh loading conditions, with testing of the coated bearings planned for mid-2025.

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