Mechatronic intelligent energy storage

10 ????· The interdisciplinary field of mechatronics, which amalgamates elements of mechanical, electrical, computer, and control engineering, has fundamentally transformed the automotive industry.

Dear Colleagues, Following the great success of the "Applications of Intelligent Control Methods in Mechatronic Systems" Special Issue, which was published in December 2020, we have decided to launch a second edition, which will hopefully be as successful and provide as much insight as the first. Mechatronics is an engineering discipline integrating the fields of ...

3. Energy Harvesting and Storage: Future naval vessels will leverage mechatronics for advanced energy harvesting and storage solutions. This includes integrating renewable energy sources and ...

2024 2nd International Conference on Mechatronic Automation and Electrical Engineering (ICMAEE 2024) Home. Committee. Speaker. Call for Papers. ... Intelligent Control Algorithms. Adaptive and Learning Control. ... Energy Storage Systems. High Voltage Engineering. Power Quality and Reliability.

Flywheel energy storage systems are high-tech mechatronics system and are widely used in [1, 2]: $ power quality improvement systems to mitigate impact of rapid active power changes or peak load ...

Adaptability and robustness in robotics and mechatronics; Intelligent human-robot interaction in the robotic and mechatronics fields; ... An event-triggered mechanism for UARs was designed, in which the energy consumption was greatly reduced and the communication efficiency between the system and the control terminal was improved. (3) ...

This paper proposes an intelligent energy management system based on multiple renewable energy sources. The intelligent energy management system is defined as a flexible energy management system built by integrating multiple renewable energy sources and facilities for energy storage. The general objective of this paper is to propose a solution to ...

Mechatronic railway switches are more reliable than their standard mechanical counterparts, allowing higher throughput of rail traffic. Vehicle-based switching allows for intelligent re-routing of trains to reduce their energy consumption and provide better services to passengers or freight operators.

This paper presents an actuator control unit (ACU) with a 450-J embedded energy storage backup to face safety critical mechatronic applications. The idea is to ensure full operation of electric actuators, even in the case of battery failure, by using supercapacitors as a local energy tank. Thanks to integrated switching converter circuitry, the supercapacitors ...

The ability to power low-power devices and sensors has drawn a great deal of interest to energy harvesting from ambient vibrations. The application of variable-length pendulum systems in conjunction with piezoelectric or electromagnetic energy-harvesting devices is examined in this thorough analysis. Because of their changeable length, such pendulums may ...

The actual gravimetric energy density is still significantly less than this, because passive components and the housing add to the overall weight. Values for other energy storage units are discussed in [4]. There it is shown that the lead accumulator is not suitable for use as a storage unit for driving energy. The battery ages with use.

Special Issues. Following special issues within this section are currently open for submissions: Design and Control of Wearable Mechatronics Devices (Deadline: 30 November 2024); Smart UAV Machines for Detection and Classification: Advancements and Applications in Renewable Energy Technologies (Deadline: 30 November 2024); Recent Advances in Medical Robotics ...

After presenting the theoretical foundations of renewable energy, energy storage, and AI optimization algorithms, the paper focuses on how AI can be applied to improve the efficiency ...

Abstract: This paper presents an intelligent energy storage system for NZEB buildings integrated in a smart grid context. The proposed methodology is suitable for NZEB buildings that include ...

College of Electrical, Energy and Power Engineering, Yangzhou University, Yangzhou, China ... With the significant development of technology, more and more intelligent mechatronics systems are designed and used to replace parts of manual manipulations. However, the working properties of mechatronics systems may be complex and there still exist ...

The paper presents an Actuation Control Unit (ACU) for mechatronic applications with embedded energy storage to face safety critical applications. The idea is ensuring full operation also in case of battery failure by using super capacitors as local energy tank. Thanks to boost converter circuitry the supercaps provide the required voltage and current levels for the required time to ...

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