Patent Search

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Abstract:

A cloud-based predictive maintenance system for electric vehicle (EV) batteries leveraging deep learning algorithms. This system is designed to proactively monitor ar battery health by analyzing historical and real-time data. The deep learning model, grounded in neural networks, excels in detecting intricate patterns within the data the early identification of potential battery degradation or failures. Integrated data sources encompass battery metrics, environmental conditions, and user behavior holistic view of battery health. The system's cloud architecture ensures scalability and dynamic resource allocation, while a user interface provides actionable insights invention promises enhanced EV battery lifespan, user trust, and potential cost savings for manufacturers.

Complete Specification

Description:The present invention pertains to the domain of predictive maintenance systems, specifically a cloud-based system designed for monitoring, diagnosing predicting the health and performance degradation of electric vehicle (EV) batteries. This system utilizes deep learning algorithms and techniques to analyze battery forecast potential failures, and recommend timely maintenance actions. The invention effectively integrates cloud computing resources, state-of-the-art deep learni models, and advanced data analytics tools to ensure the longevity and optimal performance of electric vehicle batteries.

Background of the invention:

The rapid global shift towards sustainable and cleaner energy solutions has led to a significant rise in the adoption of electric vehicles (EVs). One of the core compor these vehicles is the battery, which not only powers the vehicle but also plays a pivotal role in determining the overall performance, range, and lifespan of the EV. O just like any other component, EV batteries can degrade, leading to reduced capacity, decreased range, and even potential failures. This degradation is influenced b numerous factors, including charging patterns, environmental conditions, usage habits, and inherent manufacturing differences.

Traditionally, the assessment of battery health and predictions regarding its performance were based on simplistic heuristics or rule-based systems. These systems relied on basic thresholds or predefined parameters to alert users about potential battery issues. However, with the increasing complexity and variety of EV batterie traditional methods have proven to be insufficient. They often either fail to detect potential issues in time or generate false alarms, leading to unnecessary mainten actions or, worse, unexpected battery failures. Moreover, due to the critical importance of the battery in the overall functioning of an EV, an unexpected battery failu only causes inconvenience but also represents a significant cost implication for both the consumer and the manufacturer.

With the advancements in machine learning and, in particular, deep learning, there's been a growing interest in leveraging these technologies for predictive mainter

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