Patent Search

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Abstract:

An innovative solar charging system for electric vehicle (EV) battery management is disclosed, incorporating a fuzzy logic controller (FLC) to optimize charging efficiency and extend battery life. The system includes photovoltaic panels, an EV battery, and an FLC that processes input data reflecting solar conditions and battery status. Through fuzzy logic rules, the FLC dynamically manages the charging process, adjusting rates in response to variable solar energy supply and battery requirements. The system also provides predictive adjustments based on usage patterns and environmental data. User interaction is facilitated via a smartphone app or in-vehicle interface, enabling personalized charging schedules and monitoring. Additional features include grid interaction capabilities, adaptability to various battery types, and smart city integration, positioning the system as a scalable, intelligent solution for sustainable transportation infrastructure.

Complete Specification

Description:The present invention pertains to the field of renewable energy systems and battery management technologies, more specifically to an innovative solar charging mechanism that employs a fuzzy logic controller designed for the efficient management and optimization of electric vehicle (EV) battery charging processes.
Background of the invention:
The advent of electric vehicles (EVs) has marked a significant milestone in the transportation industry's journey towards sustainability and reduced carbon footprint. Electric vehicles offer a cleaner alternative to their internal combustion engine counterparts by eliminating tailpipe emissions. However, the widespread adoption of EVs is contingent upon the availability and efficiency of charging infrastructure, which is an area of ongoing technological evolution and innovation.
Traditional EV charging mechanisms primarily rely on grid electricity, which, despite the shift to renewable sources, still largely depends on fossil fuels. This reliance poses a challenge to the core objective of EVs, which is to reduce the carbon footprint associated with transportation. Additionally, the erratic nature of grid energy supply in various regions, along with the rising demand for electricity, stresses the existing power infrastructure and necessitates the search for alternative, more sustainable sources of energy.
In this context, solar energy emerges as one of the most promising alternatives. It is abundant, clean, and increasingly cost-effective due to advances in photovoltaic (PV) technologies. However, directly harnessing solar energy for EV charging introduces complexities due to the variable nature of solar power generation. Factors such as time of the day, weather conditions, and geographic location result in fluctuations in the energy output, which can lead to inefficient charging or potential damage to the EV batteries if not managed correctly.
To overcome these challenges, there is a need for an intelligent charging system capable of adapting to the variability of solar energy while optimizing battery life and

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