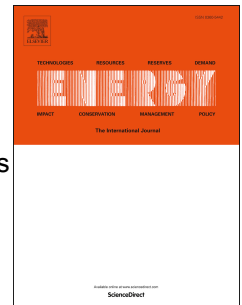


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Novel battery State-of-Health online estimation method using multiple health indicators and an Extreme Learning Machine

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Abstract

Battery health monitoring and management is critically important for electric vehicle performance and economy. This paper presents a multiple health indicators-based and machine learning-enabled state-of-health estimator for prognostics and health management. The multiple online health indicators without the influence of different loading profiles are used as effective signatures of the health estimator for effective quantification of capacity degradation. An extreme learning machine is introduced to capture the underlying correlation between the extracted health indicators and capacity degradation to improve the speed and accuracy of machine learning for online estimation. The proposed estimator is also compared to the traditional BP neural network. The associated results indicate that the maximum estimation error of the proposed health management strategy is less than 2.5 %, and it has better performance and faster speed than the BP neural network.

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