

Research on state-of-charge Estimation of Lithium-ion Batteries Based on Improved Sparrow Search Algorithm-BP Neural Network

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As one of the key parameters of the battery management system (BMS), the accurate estimation of the state of charge (SOC) of lithium-ion batteries is of great significance to the development of electric vehicles. Aiming at the problem that the BP neural network is easy to fall into the local optimum, taking lithium-ion batteries as the research object, a lithium-ion battery SOC estimation method based on the Improved Sparrow Search Algorithm (ISSA) optimized BP neural network is proposed. In order to improve the estimation accuracy, the global optimal solution of the previous generation is introduced into the discoverer's position update strategy, and the simulation experiment is carried out in MATLAB, combined with the test data for analysis. The experimental results show that the improved sparrow search algorithm can better optimize the BP neural network to estimate the state of charge of the lithium-ion battery, and the average error is controlled within 1%. The ISSA-BP model is compared with other models to verify the rationality and accuracy of the model, and provide a reliable basis for monitoring the status of other important batteries.

Keywords: Lithium-ion battery; State of charge; BP neural network; Improved sparrow search algorithm

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