Title:

A Supervised Learning Neural Network Approach for the Prediction of Supercapacitive Energy Storage Materials

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Abstract

Material researchers are progressively embracing the utilization of machine learning techniques to find hidden patterns in data and make predictions without explicit human development. Thousands of papers have been published in the use of carbon for supercapacitor applications. The manufacturing conditions for getting highly super-capacitive carbons from bio-wastes could be analyzed from the existing data using proper machine learning techniques. This work aims to provide a solution called feed forward back propagation neural networks, a supervised learning approach for the prediction of super-capacitive energy storage materials. The proposed method is to apply on the prediction of key parameters with the actual data of the two processes. The configuration of Levenberg-Marquardt backpropagation neural network has been given the smallest mean square error (0.002892, 0.006884) with correlation coefficient (0.992, 0.9789) respectively was three-layer artificial neural network with hidden layer with 9 neurons. The ANN results showed that neural network model can be satisfactorily simulate and predict the behavior of the process.

Keywords

Energy storage materials; Machine learning; Backpropagation neural network

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