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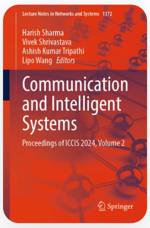

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Abstract

In the present energy utilization scenario of the electric vehicle industry, electrical vehicles are supplying energy to the microgrid system at very low-voltage conditions. The low-voltage condition comes in the microgrid because of the non-uniform power supply of the wind and other renewable systems. So, the handling of battery charging and discharging states along with the smart grid power dynamics is quite a difficult task. In this article, an Adaptive Neuro-Fuzzy Inference System (ANFIS) technology is applied to the battery storage system for electric vehicle prioritization thereby enhancing the battery lifetime. Here, the augmented ε-constraint technology is applied to optimize the multi-objective issues and the Pareto front is selected to identify the electric vehicle and smart grid optimal voltage transmission. This concept is utilized in the microgrid technology for analyzing the electric vehicle's effective utilization at different case study conditions.

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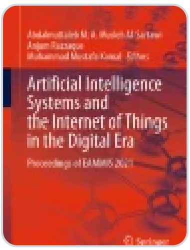

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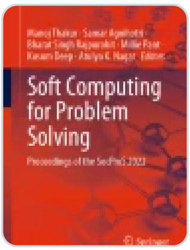

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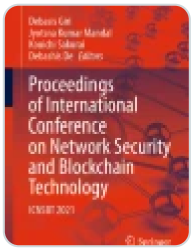

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