

عنوان مقاله:

Optimizing the Energy Consumption of an Electric Motor System Incorporates Hybrid Electric Energy Generators Using a Genetic Algorithm

محل انتشار:

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خلاصه مقاله:

This study investigates a hybrid electric system that utilizes novel energy sources and is subject to variable production and uncertainty. The study proposes a multi-objective optimization methodology using Genetic Algorithm (GA) to optimize energy source consumption and utilization, accounting for variations in production/load levels across different time intervals. The proposed approach enables the end-user to achieve desired operational outcomes while adhering to specified constraints, taking into account both economic constraints and environmental considerations. The study explores the implementation of intelligent electric energy management in a model electric motor system that incorporates various electric energy generators, including solar cells, fuel cells, micro-turbines, and batteries. The optimization problem was formulated with multi-objectives of minimizing operating cost and environmental pollution. The presented approach demonstrated that the energy management system or electrical system operator is a proficient mechanism. Ultimately, the investigation has resulted in the development of an intelligent energy management system aimed at enhancing the efficiency of the energy production and storage sampling and planning system. The findings of the optimization clearly demonstrate an inverse link between the operating costs and pollution emissions in the system under study.

کلمات کلیدی:

Multi-objective optimization, Electric motor system, genetic algorithm, Smart energy management, Cost-emission curve

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