

Can a regularised PSO algorithm reduce the electricity cost of grid-connected microgrid?

The PSO algorithm This study presents a regularised PSO algorithm to optimally control the battery energy, which reduces electricity cost of a grid-connected microgrid. The PSO is a stochastic optimisation technique that finds the optimal solutions for a formulated problem by iteratively attempting to enhance a candidate solution.

What is a regularised PSO algorithm?

A regularised PSO algorithm is presented for the application of real-time energy management. Cost functions for determining charging/discharging energy amount of a battery are analysed. A dynamic penalty function to efficiently manage battery energy is proposed to the cost function. Optimisation model is developed to optimise battery energy.

What is a PSO algorithm?

Two PSO algorithms were developed in two steps to find the optimal operating set-points. The first PSO algorithm led to the optimal set-points powers of all micro-grid generators that can satisfy the non-shiftable needs of the smart city demand with a low operating cost.

What is PSO in MG optimization?

PSO is the most frequently used method for MG optimization problems [23]; consequently, approximately 70 research papers that are based on PSO have been studied in this work. PSO is based on a swarm (population) of N particles. These particles are randomly placed in the search space D .

Can PSO be used for MG sizing and operations?

First, PSO is described, and its performance is analyzed. Second, various objective functions, constraints and cost functions that are used in MG optimizations are presented. Then, various applications of PSO for MG sizing and operations are reviewed.

What is the modification of the PSO?

The modification of the PSO consists in altering the cost function to better model the battery charging/discharging operations. As optimal control is performed by formulating a cost function, it is suitably analysed and then a dynamic penalty function is proposed in order to obtain the best cost function.

Original PSO [11,12,13,14,15] takes the inspiration from the flocking behavior of birds. The knowledge of global best found solution (typically noted $gBest$) is shared among ...

For remote areas power supply, PSO algorithm has been applied for annual cost optimization of hybrid energy scenarios. Estimated energy not contributed is integrated like a reliability constraint ...

This paper presents the Particle Swarm Optimization (PSO) algorithm to improve the quality of the power supply in a microgrid. This algorithm is proposed for a real-time selftuning method that ...

Operation of this microgrid with purpose of reduction of cost is optimized. In this paper, the Particle Swarm Optimization Algorithm (PSO) is used for optimization. At the end of a model ...

This paper reviews the cost minimization performances of various economic models that are based on PSO with regard to MG operations and sizing. First, PSO is described, and its performance is analyzed. Second, ...

A community microgrid using local resources to meet power demand is illustrated in Figure 1. The community, consisting of twenty houses, has five solar generators (4 kW) and six wind ...

Microgrid supervisory control is essential for inverter-based microgrid operation. This paper uses the PSO Algorithm, a nature-inspired optimization method, to supervise an inverter-based ...

It is of great significance to study how to use intelligent algorithm to optimize the scheduling of microgrid, so as to improve the operation efficiency of microgrid. In this paper, particle swarm ...

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