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Bio-inspired optimization of sustainable energy systems: a review. (English) Zbl 1296.90154

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Summary: Sustainable energy development always involves complex optimization problems of design, planning, and control, which are often computationally difficult for conventional optimization methods. Fortunately, the continuous advances in artificial intelligence have resulted in an increasing number of heuristic optimization methods for effectively handling those complicated problems. Particularly, algorithms that are inspired by the principles of natural biological evolution and/or collective behavior of social colonies have shown a promising performance and are becoming more and more popular nowadays. In this paper we summarize the recent advances in bio-inspired optimization methods, including artificial neural networks, evolutionary algorithms, swarm intelligence, and their hybridizations, which are applied to the field of sustainable energy development. Literature reviewed in this paper shows the current state of the art and discusses the potential future research trends.

MSC:

90C90 Applications of mathematical programming
91B76 Environmental economics (natural resource models, harvesting, pollution, etc.)

Software:

ABC ; SPEA2

Full Text: DOI

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