

عنوان مقاله:

Sub-transmission sub-station expansion planning based on bacterial foraging optimization algorithm

محل انتشار:

مجله هوش مصنوعی و داده کاوی، دوره 5، شماره 1 (سال: 1396)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

In recent years, significant research efforts have been devoted to the optimal planning of power systems. Substation Expansion Planning (SEP) as a sub-system of power system planning consists of finding the most economical solution with the optimal location and size of future substations and/or feeders to meet the future load demand. The large number of design variables and combination of discrete and continuous variables make the substation expansion planning a very challenging problem. So far, various methods have been presented to solve such a complicated problem. Since the Bacterial Foraging Optimization Algorithm (BFOA) yield to proper results in power system studies, and it has not been applied to SEP in sub-transmission voltage level problems yet, this paper develops a new BFO-based method to solve the Sub-Transmission Substation Expansion Planning (STSEP) problem. The technique discussed in this paper uses BFOA to simultaneously optimize the sizes and locations of both the existing and new installed substations and feeders by considering reliability constraints. To clarify the capabilities of the presented method, two test systems (a typical network and a real ones) are considered, and the results of applying GA and BFOA on these networks are compared. The simulation results demonstrate that the BFOA has the potential to find more optimal results than the other algorithm under the same conditions. Also, the fast convergence, consideration of real-world networks limitations as problem constraints, and the simplicity in applying it to real .networks are the main features of the proposed method

کلمات کلیدی:

Bacterial Foraging Optimization Algorithm, Genetic Algorithm, Substation Expansion Planning

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