An application of genetic algorithm and least squares support vector machine for tracing the transmission loss in deregulated power system

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ABSTRACT

This paper proposes a new method to trace the transmission loss in deregulated power system by applying Genetic Algorithm (GA) and Least Squares Support Vector Machine (LS-SVM). The idea is to use GA as an optimizer to find the optimal values of hyper-parameters of LS-SVM and adopt a supervised learning approach to train the LS-SVM model. The well known proportional sharing method (PSM) is used to trace the loss at each transmission line which is then utilized as a teacher in the proposed hybrid technique called GA-SVM method. Based on load profile as inputs and PSM output for transmission loss allocation, the GA-SVM model is expected to learn which generators are responsible for transmission losses. In this paper, IEEE 14-bus system is used to show the effectiveness of the proposed method.

KEYWORDS:

Deregulation; genetic algorithm; proportional sharing method; support vector machine; transmission loss allocation

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