电力系统仿真及分析计算

基于改进核心向量机的配电网理论线损计算方法

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摘要：

为了提高配电网理论线损计算的精度，提出了一种基于改进核心向量机(quantum genetic algorithm-core vector machine，QGA-CVM)的智能化理论线损计算方法。QGA- CVM方法将理论线损的计算抽象成回归分析问题进行求解，把理论线损已知的线路构造成样本集，以其做为CVM的数据来源加以训练，进而获得回归分析问题的拟合函数。在CVM训练过程中，利用QGA搜寻CVM的最优训练参数，以克服CVM训练参数选取的盲目性，提高了QGA-CVM的计算精度。最后通过实验验证了QGA-CVM理论线损计算方法的有效性，与传统方法相比，QGA-CVM方法在线损计算精度和速度等方面拥有更好的性能。

关键词： 配电网理论线损　核心向量机　量子遗传算法　开集测试　回归分析

A Distribution Network Theoretical Line Loss Calculation Method Based on Improved Core Vector Machine

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Abstract:

In order to improve the calculation accuracy of distribution network theoretical line loss, an intelligent calculation method based on the improved quantum genetic algorithm-core vector machine (QGA-CVM) was proposed. With the QGA-CVM, the theoretical line loss calculation is abstracted into a regression analysis, which can reach the solution; then the lines, whose theoretical losses have already been known, were structured into a sample set as the data source of CVM. In order to obtain the fitting function of the regression analysis, the sample set was trained by CVM. In this training process, the optimal training parameters can be searched by QGA to reduce the blind training parameters selection of CVM, and improve the line loss calculation accuracy based on the QGA-CVM. Finally, the experiments proved the effectiveness of the proposed theoretical line loss calculation method. Compared with the conventional methods, the QGA-CVM method has better performance in both calculation accuracy and computing speed.

Keywords: distribution network theoretical line loss　core vector machine (CVM)　quantum genetic algorithm (QGA)　opening dataset test　regression analysis

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