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Application of Support Vector Machines for Fast and Accurate Contingency Ranking in Large Power System

Soni Bhanu Pratap, Saxena Akash and Gupta Vikas

Abstract This paper presents an effective supervised learning approach for static security assessment of power system. The approach proposed in this paper employs Least Square Support Vector Machine (LS-SVM) to rank the contingencies and predict the severity level for a standard IEEE-39 Bus power system. SVM works in two stage, in stage 1st estimation of a standard index line Voltage Reactive Performance Index (PI_{VQ}) is carried out under different operating scenarios and in stage II (based on the values of PI) contingency ranking is carried out. The test results are compared with some recent approaches reported in literature. The overall comparison of test results is based on the, regression performance and accuracy levels. Results obtained from the simulation studies advocate the suitability of the approach for online applications. The approach can be a beneficial tool to fast and accurate security assessment and contingency analysis at energy management centre.

Keywords Artificial neural network · Contingency analysis · Performance index (PI) · Static security assessment · Support vector machines (SVMs)

Please note that the LNCS Editorial assumes that all authors have used the western naming convention, with given names preceding surnames. This determines the structure of the names in the running heads and the author index.

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