A new method of transient stability assessment in power systems using LS-SVM

ABSTRACT

This paper presents transient stability assessment of electrical power system using least squares support vector machine (LS-SVM) and principle component analysis. Transient stability of a power system is first determined based on the generator relative rotor angles obtained from time domain simulation outputs. Simulations were carried out on the IEEE 9-bus test system considering three phase faults on the system. The data collected from the time domain simulations are then used as inputs to the LS-SVM in which LS-SVM is used as a classifier to determine the stability state of a power system. Principle component analysis is applied to extract useful input features to the LS-SVM so that training time of the LS-SVM can be reduced. To verify the effectiveness of the proposed LS-SVM method, its performance is compared with the multi layer perceptron neural network. Results show that the LS-SVM gives faster and more accurate transient stability assessment compared to the multi layer perceptron neural network in terms of classification results.