

Article Abstract

Title:	Supervised fuzzy C-means clustering technique for security assessment and classification in power systems
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Abstract:	Security assessment is an important concern in planning and operation studies of an electric power system. Conventional method of security evaluation is performed by simulation consisting of load flow program and transient stability analysis, consuming long computer time and generating voluminous results. This paper presents a practical Pattern Recognition (PR) approach for security assessment in power systems. The problem of security assessment is focused in two modes, viz., static and transient. Static security pertains to the study of violation of system components when subjected to contingencies like line/generator outages. Transient Security study deals with system dynamic behavior when subjected to severe perturbations like three phase faults. A Supervised Fuzzy C-Means (SFCM) algorithm is proposed in the classification phase of PR system for security assessment. The proposed algorithm is tested on 39 Bus New England and IEEE 57 Bus systems. The classification results of the proposed SFCM classifier is compared with the Method of Least Squares (MLS) and Multilayer Perceptron (MLP) classifiers. The results prove that the former gives high classification accuracy and less misclassification rate compared to the latter, enhancing the feasibility and applicability of SFCM algorithm for on-line security evaluation.
Keywords:	Security Assessment, Static Security, Transient Security, Pattern Recognition, Fuzzy C-Means.