**ABSTRACT**

The modern power grid requires real-time monitoring and fast control to be protected against faults on transmission lines. The detection and classification of fault conditions in power system network is a task of crucial importance for reliable operation. The normal fault diagnosis methods depend upon the manual feature extraction of engineers with prior knowledge that has been proposed by several researchers for fault detection and classification. It is highly necessary to spot faults in any analog circuit to confirm the circuit's reliability. Early diagnosis of faults in a circuit can help to keep the system significantly by avoiding potentially harmful damage from the fault. Automatically and accurately identifying the incipient micro-fault in the power system, especially for fault orientations and severity degree, remains a big challenge within the field of intelligent fault diagnosis. Intelligent fault diagnosis methods based on machine learning became a hotspot within the fault diagnosis field. During this paper, K-means and Support Vector Machine (SVM) machine learning algorithms are discussed.