

Condition monitoring and fault diagnosis play the most important role in industrial applications. The gearbox system is an essential component of mechanical system in fault identification and classification domains. In this paper, we propose a new technique which is based on the Fast-Kurtogram method and Self Organizing Map (SOM) neural network to automatically diagnose two localized gear tooth faults: a pitting and a crack. These faults could have very different diagnostics; however, the existing diagnostic techniques only indicate the presence of local tooth faults without being able to differentiate between a pitting and a crack. With the aim to automatically diagnose these two faults, a dynamic model of an electromechanical system which is a simple stage gearbox with and without defect driven by a three phase induction machine is proposed, which makes it possible to simulate the effect of pitting and crack faults on the induction stator current signal. The simulated motor current signal is then analyzed by using a Fast-Kurtogram method. Self-organizing map (SOM) neural network is subsequently used to develop an automatic diagnostic system. This method is suitable for differentiating between a pitting and a crack fault. © 2019 Zair Mohamed, et al