World Academy of Science, Engineering and Technology
International Journal of Electrical and Computer Engineering
Vol:11, No:05, 2017

Alternator Fault Detection Using Wigner-Ville Distribution

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Abstract : This paper describes two stages of learning-based fault detection procedure in alternators. The procedure consists of three states of machine condition namely shortened brush, high impedance relay and maintaining a healthy condition in the alternator. The fault detection algorithm uses Wigner-Ville distribution as a feature extractor and also appropriate feature classifier. In this work, ANN (Artificial Neural Network) and also SVM (support vector machine) were compared to determine more suitable performance evaluated by the mean squared of errors criteria. Modules work together to detect possible faulty conditions of machines working. To test the method performance, a signal database is prepared by making different conditions on a laboratory setup. Therefore, it seems by implementing this method, satisfactory results are achieved.

Keywords : alternator, artificial neural network, support vector machine, time-frequency analysis, Wigner-Ville distribution
Conference Title : ICCSCSE 2017 : International Conference on Control Systems and Computer Science Engineering
Conference Location : Berlin, Germany
Conference Dates : May 21-22, 2017