Improvement of 'winner takes all' neural network training for the purpose of diesel engine fault clustering

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Abstract

© 2016 IEEE.To create a diagnostic system for diesel engines, it is necessary to analyze a huge amount of data obtained from the automated test systems for diesel engines. Therefore, it is worth to implement the analysis with the help of an artificial neural network. The application of the artificial neural network for diesel engine fault clustering allows reducing the amount of stored data by creation of a knowledge database for the weighting factors. Self-training makes it possible to revise this database, improving the accuracy of clustering, and to modify network structure, in case the new types of faults will appear. The modified neural network training algorithm involves the usage of input vector data originally found within each cluster group as the initial weighting factors. This algorithm allows decreasing the load on the computing devices by reducing the number of training cycles in comparison with other existing algorithms. The efficiency of the method can be improved with a larger number of samples and dimensions of input and output parameters.

Keywords

diagnostics, diesel, fault, neural network, test, training

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