Modernized algorithm of neural network initial weighting factors during the diagnosis of diesel engine faults

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Abstract

© Research India Publications. A lot of knowledge and experience is required in order to perform diesel fault diagnosis from an expert. However, one should not rule out the "human factor", the expert may forget something or miss some important facts during analysis. In order to assist an expert during the analysis of diesel engine faults the task of an expert system development becomes a relevant one. It is advisable to develop this system based on an artificial neural network, which allows to classify diesel faults. The application of an artificial neural network for solving this class of problems makes it possible to reduce the volume of stored data through the creation of a weight factor knowledge base and to carry out a refinement of this base through training if necessary, which allows to improve the accuracy of clustering, as well as to change the network structure easily if new types of faults appear. The modernized method is based on the appointment of an input vector data as the initial weighting coefficient which is encountered first in each cluster group. The effectiveness of the modernized algorithm concerning the selection of initial weighting factors prior to existing ones is in the significant reduction of training cycle number, reducing the load on processing devices. The greatest effect may be achieved at a large number of training samples, and the dimension of an input and an output vector.

Keywords

Diagnosis, Diesel, Fault, Learning, Neural network, Testing