

Developed CNN Model with Various Input Scale Data Evaluation for Bearing Faults Prognostics

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Abstract : Rolling bearing fault diagnosis plays a pivotal issue in the rotating machinery of modern manufacturing. In this research, a raw vibration signal and improved deep learning method for bearing fault diagnosis are proposed. The multi-dimensional scales of raw vibration signals are selected for evaluation condition monitoring system, and the deep learning process has shown its effectiveness in fault diagnosis. In the proposed method, employing an Exponential linear unit (ELU) layer in a convolutional neural network (CNN) that conducts the identical function on positive data, an exponential nonlinearity on negative inputs, and a particular convolutional operation to extract valuable features. The identification results show the improved method has achieved the highest accuracy with a 100-dimensional scale and increase the training and testing speed.

Keywords : bearing fault prognostics, developed CNN model, multiple-scale evaluation, deep learning features

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