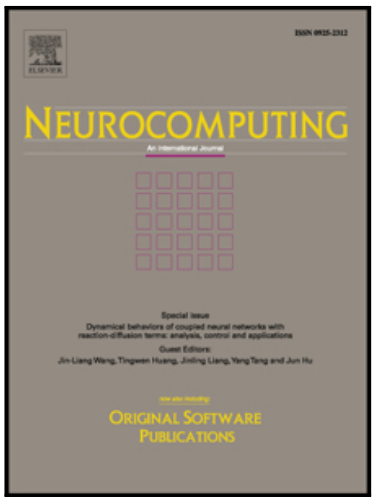

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Highlights

1. CatGAN and AAE are introduced in unsupervised fault diagnosis of rolling bearings for their great ability of unsupervised clustering and mapping respectively.

2. By adding a classifier on the latent layer of AAE, we propose a new model named CatAAE for unsupervised clustering and exhibit the better performance compared with other methods.

3. Mixed time-frequency features are employed in the method to get a better robustness under different environments.

4. Considering about the expenses of labeling data, the proposed unsupervised method is more practical for application.

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