

工程与应用

## 基于WPA-SVM的多分类故障混合诊断模型

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**摘要** 针对目前机械故障诊断中难以进行特征提取和常规SVM算法诊断多类分类问题时存在困难等问题, 提出了结合了WPA理论和基于二叉树的多级SVM分类器的WPA-SVM多分类故障混合诊断模型。采用小波包分析对机械信号提取频域能量特征向量, 通过训练多个依赖故障优先级的基于二叉树的多级SVM分类器中, 找到样本中的支持向量, 并以此决定超平面。然后根据最优分类平面, 对测试集的样本进行故障诊断。通过对两种不同特征提取方法、三种不同SVM识别策略的实验比较结果可知, 该方法是有用的。

**关键词** [小波包](#) [支持向量机](#) [多分类](#)

分类号

## Multiple classification fault diagnosis hybrid model based on WPA-SVM

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### Abstract

Aiming at the difficulty in extracting eigenvectors and the difficulty of traditional SVM algorithm in diagnosis multi-classification, a novel hybrid model for machinery fault diagnosis combining wavelet packet analysis and multiple support vector machine classifier based on binary tree is put forward. According to the method, the energy of different frequency bands after wavelet packet decomposition, as eigenvectors, are input into the multiple support vector machine classifier depend on fault priority to find support vectors and construct hyperplane. And then testing samples are diagnosed according to the hyperplane. Experimental results show that the method proposed above is effective.

**Key words** [wavelet packet](#) [Support Vector Machine](#) [multiple classification](#)

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