基于复合特征和 FOAGRNN 的心电图分类

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摘要： 为提高心电图分类的准确度，提出一种基于复合特征和 FOAGRNN 的心电图分类方法.该方法首先用核独立主元分析（KICA）对心电信号进行非线性特征提取得到特征向量 A，其次采用小波包变换对心电信号进行多尺度分解，提取小波包节点系数重构后的归一化能量组成特征向量 B，A 和 B 组合成复合特征向量 C 作为心电信号特征，再者利用果蝇算法（FOA）优化广义回归神经网络（GRNN）参数构建出 FOAGRNN 模型，最后利用优化后的分类模型对心电特征进行识别分类.仿真实验结果表明，FOAGRNN 分类方法较其它方法具有很高的分类准确度，分类正确率可达到 99.0%.
关键词： 果蝇算法；广义回归神经网络；核独立主元分析；小波包；心电图分类；特征提取

The Electrocardiogram Classification Approach Based on Wavelet Transform and FOAGRNN

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Abstract： In order to improve the accuracy of ECG classification, an ECG classification method based on comp-osite characteristics and FOAGRNN is proposed. First of all, this method begins by using the Kernel Independen-t Component Analysis (KICA) to get the characteristic vector A from extracting the nonlinear feature of the EC-G signals, then, wavelet packet transform is used to analyze multi-scale decomposition of ECG signals, ex-tracting the normalized enery which is reconstructed from wavelet packet node coefficient to compose the charact-erristic vector B, acting the compound eigenvector C which is composed by A and B as the ECG characteristic-s. Meanwhile, the fruit fly algorithm (FOA) was used to optimize the generalized regression neural network para-meter to construct the FOAGRNN model. Finally, identifying and classifying the ECG characteristics by the opti-mized classification model. The simulation results show that the classification accuracy of FOAGRNN classificati-on method is so higher compared with other methods, the classification accuracy can reach 99.0%.
Key words： fruit fly algorithm；GRNN；KICA；wavelet packet；ECG classification；feature extractio

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