基于FFT-Matching Pursuit的心电身份识别算法研究

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基金项目：嵌入式心音身份识别关键技术研究及装备研制

摘　要：

本文研究了心电信号在身份识别中的应用，提出了基于快速傅里叶变换的匹配追踪心电特征提取算法。在预处理阶段，对心电信号进行消噪、标准化和质量检测等预处理，有效去除了心电信号中的噪声和心率变异所带来的干扰。特征提取阶段，对心电模板进行基于快速傅里叶变换的匹配追踪稀疏分解，原子的时频参数和投影值作为特征参数，然后构建支持向量机分类器，实现了身份识别。最后利用MIT-BIH的ST Change、PTB、QT等数据库测试了算法性能，获得了较高的识别率。

关键词：心电；生物识别；匹配追踪；辨识

Research of ECG identification based on FFT-Matching Pursuit Algorithm

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Abstract:

In this paper, ECG biometrics is studied and feature extraction method based on Fast Fourier Transform-Matching Pursuit is proposed. The ECG identification algorithm uses a robust preprocessing stage to eliminate the effects of noise, heart rate variability, and poor quality ECG signals. FFT-MP sparse decomposition algorithm is used to extract the features in one heartbeat signal. The Support Vector Machine classification is constructed to complete the identification. The performance of algorithm with different parameter setting is evaluated using MIT-BIH ST Change、PTB、QT ECG database. Results indicate that a robust subject recognition rate of 97.1% over 32 subjects.

Keywords: Electrocardiogram; Biometrics; Matching pursuit; Identification

投稿时间：**2012-11-16**

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