

基于加速度的小波能量特征及样本熵组合的步态分类算法

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摘要:

目的 针对传统的使用小波分解系数作为特征对走路、上楼、下楼进行分类时不能对具有相同强度加速度信号于样本熵和小波能量相结合作为特征的分类算法。方法 利用三轴加速度传感器采集走路、上楼、下楼三种步态下的能量特征和样本熵特征, 构建决策树分类器和贝叶斯分类器。结果 决策树分类器和贝叶斯分类器的总体分类精度分别为特征的分类精度比仅使用小波能量的分类精度提高了15.85%和19.17%。结论 就步态分类精度而言, 样本熵与小波能量相结合的分类精度优于仅使用小波能量的分类精度。

关键词: 步态分类; 样本熵; 小波能量; 贝叶斯; 决策树; 计步器; 加速度

Gait Pattern Classification with Wavelet Energy and Sample Entropy Based on Acceleration

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Abstract:

Abstract: Objective It is unavailable for the classification of gait samples with a same-intensity acceleration signal by use of wavelet energy alone. Method A new method of sample entropy combined with wavelet energy was proposed. Signals of one's upper limb were captured, then the characters of energy and sample entropy were measured for the construction of the classification algorithm. Results The general classification accuracy of decision tree and Bayes classifier improved 15.85% and 19.17% compared with wavelet energy alone. Conclusion As far as the precision of gait classification is concerned, the combination of sample entropy and wavelet energy was better than the wavelet energy alone.

Keywords: Keywords: gait pattern classification; sample entropy; wavelet energy; Bayes; decision tree; pedometer; acceleration

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