论文

基于AdaBoost的音乐情绪分类

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摘要
随着流媒体应用的蓬勃兴起，音频信号的自动分类开始成为工程与学术关注的热点之一。根据音乐信号对乐曲表现的情绪进行分类，由于涉及音乐信号的社会属性和自然属性的综合表征与模糊分类，因此处理方法相应需要在各种传统表征与分类方法的基础上进行机制筛选与架构优化。该文探讨了在AdaBoost算法，K-L变换和GMM模型的基础上构造弱分类器的方法，采用多层分类器结构，成功地实现了对音乐信号进行情绪分类。初步的实验对163首歌曲进行平静(Calm)，悲伤(Sad)，激动(Exciting)以及愉悦(Pleasant)4种类别的分类，训练集和测试集的分类准确率分别达到97.5%和93.9%，展示了这种方法的可行性和进一步发展的潜在价值。

关键词   AdaBoost 音乐 情绪 音色 节奏 分类 K-L变换 多层分类器

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Mood Classification of Music Using AdaBoost

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Abstract
With fast development and boosting of stream media applications, automatic classification of audio signals becomes one of the hotspots on research and engineering. Since mood classification of music is involved with integrated representation and classification of social and natural properties of music, mechanism selection and architecture optimization should be implemented on the basis of different traditional music representations and classification methods. This paper discusses formation of weak classifiers in AdaBoost algorithm based on K-L transformation and GMM training and realizes mood classification of music with multi-layer classifier architecture. The experiments classify 163 songs into four mood classes: calm, sad, exciting and pleasant with 97.5% accuracy on training data and 93.9% accuracy on test data, which proves feasibility and potential value of this method.

Key words   AdaBoost Music Mood Timbre Tempo Classification K-L transformation Multi-layer classifier

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扩展功能

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