Singer Identification Using MFCC and CRP Features with Support Vector Machines

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Abstract Singer identification is the process of identifying or recognizing the singers based on the uniqueness in their singing voice. It is a challenging task in music information retrieval because of the combined instrumental music with the singing voice. The work presented in this paper recognizes a singer using Mel Frequency Cepstral Coefficient (MFCC) features and Chroma-Reduced Pitch (CRP) features with Support Vector Machines (SVM). The proposed technique for singer identification has two phases: feature extraction and identification. During the feature extraction phase, MFCC and CRP features are extracted from the songs in a database of popular music. In the second phase, the extracted features are trained with the SVM classifier. To evaluate our work, a dataset of 50 music clips was tested against the trained models of various singers. An equal error rate of 8% and 56% is achieved with SVM using MFCC and CRP features, respectively. By combining MFCC and CRP features at score level, an EER of 6.0% is obtained which indicates a significant increase in identification rate.

Keywords Singer identification · Mel frequency cepstral coefficients · Chroma-reduced pitch · Support vector machines

1 Introduction

Music is an inevitable part of all ages of human life. With the rapid development in the digitization, the number of users and revenue generated from the digital music industry is growing amazingly. In the last few years, the music industry has shown a growth of 26% in revenue. The paid subscription of online music users has expected

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