Automatic Recognition of Bird Species from Continuous Birdsong Recordings

李建興,石昭玲,徐勝斌
Computer Science & Information Engineering
Computer Science and Informatics
chlee@chu.edu.tw

Abstract

In this paper, we will propose an approach for the classification of bird species using fixed-duration sound segments extracted from continuous birdsong recordings. First, each sound segment is divided into a number of overlapped texture windows. Each texture window will be individually classified and then a fusion approach is employed to determine the classification result of the input segment. The features derived from static, transitional, and temporal information of twodimensional Mel-frequency cepstral coefficients (TDMFCC) will be extracted for the classification of each texture window. TDMFCC can describe both static and dynamic characteristics of a texture window, DTDMFCC is used to describe sharp transitions within a texture window, and GDTDMFCC is developed to describe long-time temporal variations in a texture window. Furthermore, we use principal component analysis (PCA) to reduce the feature dimension, Gaussian mixture models (GMM) to model the sound of different bird species, and linear discriminant analysis (LDA) to improve the classification accuracy at a lower dimensional feature vector space. In our experiment, the highest average classification accuracy is 91.48% for the classification of 28 kinds of bird species.

Keyword：two dimensional Mel-frequency cepstral coefficients (TDMFCC); GMM; PCA; LDA; continuous birdsong recognition