

GMM-BASED PARAMETERIZATION OF THE CHARACTERISTIC MELODY OF BIRD VOCALIZATIONS

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Abstract. We present a new method for the parameterization of the characteristic melody of birdsongs that makes use of Gaussian Mixture Models (GMMs) in order to interpolate the individual segments of the characteristic curve computed for each acoustic event. Initially, the proposed method implements morphological processing and automatic segmentation of the bird-song to separate acoustic events based on the audio spectrogram. This is followed by an estimation of the dominant frequency component, smoothing of the dominant energy contour and reduction of the image to black and white. The characteristic curve obtained for each acoustic event is then interpolated with a six-component GMM. The outcome of this process is a parametric model which describes segments of a varying length and complexity with a predefined number of parameters. These parameters can serve well in birdsong modeling or species recognition applications. We illustrate the applicability of the proposed approach on publicly available field recordings of species *Myrmotherula multostriata*, which had been recorded in their natural habitats.

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1. Introduction

The characteristic melody of birdsongs well describes the overall dynamics of bird vocalizations and the basic parameters of the sound source, which makes it an important evidence in tasks related to bird species recognition and studies on bird song repertoire. However, the birdsongs recorded in natural habitats of wild species and the soundscape recordings usually contain high-levels of environmental noise