AUDIO TAG CLASSIFICATION: MIREX 2013 SUBMISSIONS

Karam Byun[1], Seung-Ryoel Baek[1], Jong-Soel Lee[2], Sei-Jin Jang[2], and Moo Young Kim[1]

[1]Dept. of Information and Communication Engineering, Sejong University, Seoul, Korea
`ge2ode2@gmail.com,`
`daey7979@nate.com,`
`mooyoung@sejong.ac.kr`

[2]Digital Media Research Center, Korea Electronics Technology Institute, Seoul, Korea
`{leejs,sjjang}@keti.re.kr`

ABSTRACT

In this submission system, novel spectro-temporal features are extracted and a support vector machine (SVM) is used as a classifier. The feature-selection algorithm such as an SVM ranker is applied to reduce the computational complexity.

1. INTRODUCTION

We propose the novel audio tag classification system. Firstly, timbral features are extracted from the audio signals, and the spectro-temporal features are extracted using the timbral features. Secondly, the feature-selection algorithm is applied for the spectro-temporal features to reduce the computational complexity. Lastly, tag modeling and classification are performed based on a support vector machine (SVM).

2. FEATURE EXTRACTION

Mel-frequency cepstral coefficients (MFCC), decorrelated filter banks (DFB), and octave-based spectral contrast (OSC) are extracted as timbral features using a hamming window of around 92 ms with 50 % overlap for a sampling frequency of 22.05 kHz. As spectro-temporal features, statistical and modulation features are extracted using the timbral features. The statistical features such as mean, variance, min, and max are extracted from the timbral features for each texture window [1] of around 3s with 50% overlap. The modulation features include modulation spectral flatness/crest measures (MSFM/MSCM) [2], modulation spectral contrast/valley (MSC/MSV) [3], feature-based MSV/MSC [4], feature-based MSFM/MSCM [5], and feature-based autoregressive model features. Also, each feature is normalized between 0 and 1. An SVM ranker is used as a feature-selection algorithm to increase the recognition performance and decrease the computational complexity. The selected feature sets are different for different tasks.

3. CLASSIFICATION

In the proposed systems, we use an SVM as a classifier [6]. Gaussian radial basis function (RBF) kernel and one versus one SVM method are used. Furthermore, C and γ parameters for each task are estimated using a grid search.

4. TAGGING

This tag classification task from single to multi-label classification is a simple extension of the genre/mood/composer classification tasks. There are two required output for the audio tag classification: affinity and binary classification.

6. REFERENCES

[1] G. Tzanetakis, "MARSYAS submissions to MIREX 2009," in Music Information Retrieval Evaluation eXchange (MIREX), 2009.

[2] D. Jang and C. D. Yoo, "Music information retrieval using novel features and a weighted voting method," in Proc. IEEE Int. Symposium Industrial Electronics, pp. 1341-1346, 2009.

[3] C.-H. Lee, J.-L. Shih, K.-M. Yu, and J.-M Su, "Automatic music genre classification using modulation spectral contrast feature," in Proc. IEEE Int. Conf. Multimedia and Expo, pp. 204-207, 2007.

[4] C.-H. Lee, J.-L. Shih, K.-M. Yu, and H.-S. Lin, "Automatic music genre classification based on modulation spectral analysis of spectral and cepstral features," IEEE Trans. Multimedia, vol. 11, no. 4, pp. 670-682, 2009.

[5] S.-C. Lim, J.-S. Lee, S.-J. Jang, S.-P. Lee, and M. Y. Kim, "Music-genre classification system based on spectro-temporal features and feature selection," IEEE Trans. Consumer Electronics, vol. 58, no.4, pp. 1262-1268, 2012.

[6] C.-C. Chang and C.-J. Lin, "LIBSVM - A Library for Support Vector Machines," ACM Trans. on Intelligent Systems and Technology, 2011.