

# Automatic Music Genre Classification Using Modulation Spectral Features and Nonparametric Discriminant Analysis

李建興, 周智勳, 方仁政

Computer Science & Information Engineering

Computer Science and Informatics

chlee@chu.edu.tw

## Abstract

In this paper, we will propose an automatic music genre classification approach based on long-term modulation spectral analysis of spectral (OSC and MPEG-7 NASE) as well as cepstral (MFCC) features. Modulation spectral analysis of every feature value will generate a corresponding modulation spectrum and all the modulation spectra can be collected to form a modulation spectrogram which exhibits the time-varying or rhythmic information of music signals. Each modulation spectrum is then decomposed into several logarithmically-spaced modulation subbands. A new set of modulation spectral features, including modulation spectral contrast (MSC), modulation spectral valley (MSV), modulation spectral energy (MSE), modulation spectral centroid (MSCEN) and modulation spectral flatness (MSF) are then computed from each modulation subband. Effective and compact features are generated from statistical aggregations of the MSC, MSV, MSE, MSCEN, and MSF features of all modulation subbands. An information fusion approach which integrates both feature level fusion method and decision level combination method is then employed to improve the classification accuracy. Experiments conducted on ISMIR 2004 music dataset have shown that our proposed approach can achieve higher classification accuracy than other approaches with the same experimental setup.

Keyword : Mel-frequency cepstral coefficients, modulation spectral analysis, music genre classification,