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A NOVEL APPROACH FOR MUSIC CLASSIFICATION BY EXTRACTING SCORE FEATURES

Cheng-Che Lu and Vincent S. Tseng*

Department of Computer Science and Information Engineering
National Cheng Kung University
Tainan, Taiwan
*Corresponding author: tsengsm@mail.ncku.edu.tw

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Abstract. *Although music classification has been widely discussed, relatively few studies have explored the topic of polyphonic music classification. On the other hand, Bellini et al., 2005 revealed the importance of integrating symbolic music representation with multimedia objects due to the development of the MPEG standard. Therefore, it is foreseen that more and more music objects in symbolic format and multimedia objects, integrated with symbolic music representation, will be published via the Internet, as video and audio presentations. To cater to future music-related applications of these symbolic music representations, we propose a novel approach to music classification by discovering high-level features of polyphonic music from the score. Overall, the main goal of this paper is to present a new conceptual framework that can automatically parse MusicXML files and extract their qualitative and quantitative features. In addition, we also propose appropriate features to improve classification accuracy and create an effective classifier for automatic music classification. To assess the proposed approach, music features extracted from a score were used to test the music classification accuracy by employing the decision tree-based (C4.5), SVM, and k-NN methods. The experimental results show that the proposed approach substantially outperforms other methods in terms of classification accuracy.*

Keywords: Music classification, Music feature, Music representation, Data mining

1. **Introduction.** Although a number of studies have been done on the topic of music classification, most of these have focused only on the mono music of MIDI (Chai & Vercoe, 2001; Shan & Kuo, 2003). In fact, the classification methods for mono music are unrealistic for the classification of popular music. However, polyphonic music classification has still rarely been studied. In considering the issue of music classification, the critical question is how to obtain useful features and then put them into the best classifiers, such as C4.5. Furthermore, in a related area of music classification, we found that the extraction of features can be divided into two categories: low-level and high-level features. In the category of low-level features, Tzanetakis *et al.* (2002) used a variety of low-level features to classify musical genres and achieved an accuracy of 61%. McKinney *et al.* (2003) employed a standard Gaussian framework to evaluate four audio feature sets and achieved an accuracy of 74%. Moerchen *et al.* (2006) stated that many audio features have been proposed, but they did not provide easily understandable descriptions of music. Neither did they perform exhaustive feature generation based on temporal statistics or

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