Timbre-Based Percussive Rhythm Classification and Retrieval

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ABSTRACT

Evidence within music information research suggest that timbre plays a more important role in rhythmic similarity than previously thought, as shown by M. Haro, P. Herrera [1]. Similar to other recent rhythm feature classification techniques, our system aims to use timbre as a primary method for establishing context between inter-instrument features [2], further informed by [3]. Namely, source classification of MFCCs extracted from Probabilistic Latent Component Analysis, [4] directly informs hierarchical rhythm feature analysis. A joint timbre-rhythm feature set describes percussive rhythm group similarity relying almost entirely on non-pitched timbres, (e.g. snare, kick-drum,etc), and is robust to noisy and highly polyphonic datasets.

We propose a demonstration of this recently evaluated computational model incorporating a new hierarchical PLCA algorithm designed to address the challenges regarding multi-level rhythmic grouping on real-world audio. This demo is implemented in the *AudioDB* framework, a feature vector database management system, allowing for scalability and adaptability of these techniques to a wide range of purposes [5]. We present our work using a front-end GUI developed for AudioDB called *Camus* allowing listeners to audition results.

One goal of this approach is integration of low-level feature extraction into a perceptually informed mid-level system, similar to studies performing song-level description/transcription of drum timbres using source separation techniques including Dittmar [6], and Gillet et al. [7].

Unlike similarly proposed systems of drum classification, our focus is on rhythm matching of distinctive rhythm groups as musicological features. In other words, we aim to identify and describe rhythmic structures that appear frequently in musical databases and describe a kind of inter-genre phenomenon, (e.g. breakbeats). Ultimately, we also feel these topics and demo will spark useful discussions within the ISMIR community concerning the benefits and trade-offs with future integrated approaches to audio analysis and the design and purpose of higher levels of musical analysis.

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