

Rhythmic Analysis of Carnatic Style Percussive Music Using an Adaptive Time Domain Decomposition Method

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Tempo and meter are important features regarding the structure of a musical composition. Rhythm in most musical cultures is organized based on hierarchical metrical cycles. Most of these metrical cycles can be described using rhythmic events at different metrical levels. This poster explores a novel methodology for the analysis and estimation of short and long-term structures in *ādi tāla* Carnatic style percussive compositions. The proposed approach provides insight into the hierarchical metrical levels of the compositions and their relationships. The methodology is based upon a combination of a novelty function and the Ensemble Empirical Mode Decomposition (EEMD) method. The novelty function computed represents the rhythmic signature of the signal by identifying important rhythmic events in different frequency bands. EEMD is used as a periodicity detection technique to decompose the rhythmic signature of the signal into hierarchically ordered components representing the rhythmic structure of the signal in different time scales. Time-scales close to the tempo and cycle period can be identified and used for tempo and *tāla* estimation respectively. The method is tested on an annotated collection of pieces spanning three different variations of *tāla* compositions and tempi.