

A Data Mining Approach for Taal and Laya Recognition of North Indian Classical Music

B. Hettiarachchi¹, J. Charles¹ and L.S. Lekamge^{1*}

^{1*}*Department of Computing and Information Systems, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka*

²*Department of Musicology, University of the Visual and Performing Arts, Colombo, Sri Lanka*

Music plays a vital role in our day-to-day life, especially in today's digital age. Computational musicology is an interdisciplinary area in which computational methods are used to analyse musical structures: notes, chords, rhythms, and patterns thereof. While western classical music is extensively explored, North Indian classical music remains to be explored computationally. Meanwhile, our recent review of the literature revealed that *Raag* identification is among the frequent data mining tasks applied to North Indian music. However, recognition of their rhythmic structures is also important as it serves in a multitude of applications e.g., intelligent music archival, enhanced navigation and retrieval of music, and informed music listening. Rhythm in North Indian classical music revolves around the theme of Taal - the cycle of beats of specific syllables and beats. It is the most basic information for listeners to follow the rhythmic structure of music. Laya is the speed of Taal and may vary between Vilambit (slow), Madhya (medium), and Drut (fast). Taken together, the main aim of the proposed study is to apply data mining for the recognition of Taal and Laya in North Indian classical music. A dataset of 151 excerpts (2mins; 44.1 kHz; stereo; .wav) from CompMusic Hindustani test corpus, belonging to four popular Taals is used in the study. For each *Taal*, there are excerpts in three *Layas*. Acoustic features pertaining to fluctuation, beat spectrum, onsets, event density, tempo, metre, metroid, and pulse clarity will be extracted using MATLAB MIRToolbox. The performance of frequently adopted algorithms e.g., k-Nearest Neighbor and Support Vector Machine is to be compared in the study with the aim of developing a classifier with higher accuracy. Even though the findings of the study would be limited by the consideration of a smaller dataset, the study would make a promising contribution through computationally exploring rhythmic patterns of a great musical tradition

Keywords: Music data mining, Taal and Laya recognition, North Indian classical music, Rhythmic analysis, Computational musicology