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Categorization of ICMR Using Feature Extraction Strategy And MIR With Ensemble Learning

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Abstract

The Indian classical music and the raga's studied in this research paper. This paper focuses on categorization of these ragas into various different categories based on their features extracted. The tools like PRAAT, MIRchromagram and WEKA have been used for the simulation. The results proved the efficiency increased to 89%.This paper includes the ensemble approach that is used to categorize the Indian classical raga's based on their different characteristics. This paper also shows the comparison of different models as well so as to measure the percent changes in their performance.

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Keywords: MIR(Music Information retrieval); Chromagram; onsets; Raga; classification.

1. Introduction

The music information retrieval tasks considered as main focus. While doing the categorization of various raga, the Indian classical music subdivided using these raga into different classes. The ancient raga artists and performers created groups of different ragas based on the time zones (also known as *Prahar's*). The ragas when recited according to the time group, it would have maximum impact on the sentiments or the mood of the peoples.

The new learners in the music field find it very difficult to identify the *raga* from any musical excerpts when played. Hence there is a necessity of quick identification of the associated *raga*. This paper presents the

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approach of ensemble learning for the different *ragas*. The combination of various learners provides the possibility to create and comparison parametric evaluation and enhances the accuracy in real sense. The ICMR *(Indian Classical Music Raga)* is the grouping of the various *raga* that can be classified in to different *thaats* and hence it could be easy to further categorize them in to the various *ragas*.

1.1. *Basic Raga Structure:* The *Raga* [1] follows the structure with the pitch class representation; which can be described by the frequency estimates on each key. Hence when the key are displayed on any musical instrument are pressed and played with the desired interval and sequence it produces the *raga.* In the Hindi scales include the *Sa* from first black key/note. But in the western scales [2] the *Sa* resembles to the Key C. and fifth note from C is fifth note. In the western note the C doesn't changes. Only the scales show the pitch changes. In the western notes there is an absolute naming for the keys in each and every octave on the keyboard or frets on guitar. But there is a difference that in Indian scheme the notations are relative.

The *desi* music combines the both of Indian as well as Western styles. The music structure includes the scale on seven note or the seven note scale, in which the second, third, fourth , sixth, and seventh notes can be treated as sharp or flat. In Indian music there is no absolute pitch, but instead each performance is simply pics the ground note; this ground note would be treated as a fundamental frequency. And the other scale degrees follow relative to the ground/fundamental frequency note. Where, the scale is the set of 7 Notes with predefined intervals. So when starting from the F note we could still form the *Sa, Re, Ga, Ma, Pa, Dha, Ni* from that note. The interval is the distance between the notes. Hence it can be concluded that the scales and the raga are not the same. And the scale is the predefined interval of the seven notes.

2. Literature Survey:

The *raga* can have 4 or more notes with the intervals. Some of the findings are also reluctant to say that western music is fast and the Indian music is totally based on the formation of these seven or less key combinations and thus it is melodic. And the western music is basically *harmonic* in nature, and uses chords to produce the harmony. The literature survey includes all the recent studies in this field. As anyone can see the MIR is very interesting and emerging field for those who have knowledge in this field. The music professionals are facing the challenges related to this field as they saw the musical data is very difficult to categorized in any of the class based on the musical characteristics like *raga* , genre, artist, sentiments, mood, feelings etc. to name a few.

The Nomenclature of the raga		
Tiver or *Sharp* (Black keys)	Capital letters	R, G, M, D, N
Komal or *Flat* (White keys)	Small letters	r, g, m, d, n
C further nomenclature continues down the page inside the text box		

The following fig. 1 shows the instrument harmonium for the key distribution on it, according to octave.