

Raag detection in music using supervised machine learning approach

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Abstract

There are several research work is in progress in the direction of Raag detection. Raag is one of the melodic modes used in traditional South Asian music genres such as Indian classical music and qawwali. It can be said that Indian classical music is always set in a rāga. Non-classical music such as popular Indian film songs and ghazals sometimes use raagas in their compositions. There are several obstacles in accurate Raag detection technique. The major challenges are the complex parameters like pitch and mood in the music, skipping extra tones, conversion of different data attributes and Raag tempo. In this paper different classifiers like Bayesian net, naïve Bayes, support vector machine (SVM), J48, decision table, random forest, multi-layer perceptron and PART performance are analyzed. The music features are extracted using MIRToolbox in MATLAB. These extracted features are arranged in .arff file format. WEKA tool is used. The results shown below clearly indicate that the accuracies of all the classifiers after the discretization have increases considerably. While the accuracy of the probability based classifier are best in this Raag detection from music.

Keywords

Raag, Thaats, Naïve bayes, Decision tree, Support vector machine (SVM).

1.Introduction

In the ancient times music is the heart of India and the other countries. The root of Indian classical music is very rich. It includes many gharana and the different style and tradition for those gharana. Bhatkhande [1] describes the culture of these gharana and their music forming methods. Indian classical music can be categorized into two main streams like North Indian and South Indian based music and styles. Raag is essential building blocks in Indian classical music. Melodic mode of music comprises of five to nine musical notes is also termed as Raag.

In the recent past there are several works have been done on musical analysis and specially the Indian classical music, generating lot of new insight into this domain. The research related to musical information retrieval is thus attracting the interest of so many researchers. The music is categorized in different thaats based on which the ragas are derived. Different Distributions of notes making different note structures are called thaats.

The Latest research methods and techniques are focusing on carnatic raga and its analysis.

The music research and its analysis play an important role in finding the raga patterns on various ways. To identify their variety the thaata categorization is available in [1]. It is a system that is very relevant with this type of categorization. In 2013, Sharma et al. [2] proposed that thaats are classified in 10 different ways which are as follows: Bilawal, kalyan, Todi, Bhairavi, Marwa, Kafi, Bhairav, Khamaj, Purvi, Asavari. These Thaats (raags) possess very different structural patterns so they can be distinguishably identifiable [1].

2.Related work

In 2013 Chordia et al. [3] found that how the raga and the tonic are both mutually attached to each other. In their study they introduced some technique to identify the raga by the histogram approach and the Hidden markov model technique. The various studies in the same field discussed. There results suggest that the tonal features based on pitch distributions are robust, reliable features that can be applied to complex melodic music. In 2002, Tzanetakis [4] has also proposed various schemes in the English music classification based on their moods and styles of the performer as well as songs genre classification. Clustering is suggested as the classifier [5]. Sentiment analysis of movie review based on naïve Bayes and genetic algorithm is suggested in [6]. Since this methodology depends on the

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