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Music Information Retrieval Raga Identification Based on Carnatic Music

Miss.Jayshri A.Mahajan
Bachelor of Engineering, Student, Department Of Computer Science& Engineering
Shri Sant Gadge Baba college of engineering,Bhusawal, North Maharashtra University Jalgaon,Maharashtra-425203
jayshrimahajan14@gmail.com

ABSTRACT
A method to identify the raga of a Carnatic music. Carnatic Music is the name given to the Classical Music of South India. Carnatic Music is believed to have divine origins - spirit Saraswati, the Hindu deity of Learning, is depicted with the veena, a fretted musical instrument. A Raga is the basic melodic form used in Indian traditional Music, both Hindustani as well as Carnatic style It is a composite idea that can be dealt with at various levels from philosophical to technical. However, it is much more than just the sum of those characteristics. The frequency components of the signal are then determined and we map these frequency components into the swara sequence and thereby determine the Raga of the exacting song, which could be used to index the songs and further for retrieval based on the Raga.

Keyword:- Carnatic music, Raga ,music information retrival, Existing work,future work.

I. INTRODUCTION

Music information retrieval is the need of the hour due to the availability of large amount of music on the Internet. It can be thought of as part of Multimedia in sequence retrieval. A group of work has been done in the other components of multimedia like text, video and audio. Audio processing involves processing language and music. In this document we discuss music processing which could be used as the basis of music information retrieval raga identification using carnatic music characteristics. . The content of Indian music includes musical components, such as the Raga and the Tala, and nonmusical components, such as the Singer, the Instrument, the Genre and the Emotion. A combination of signal processing techniques with Carnatic music specific characteristics is used to intelligently process the music signal to understand and determine the content of the given musical piece from the initial 2 minute duration of the song which may contain an alaap followed by pallavi or the pallavi alone.

II. CHARACTERISTICS OF CARNATIC MUSIC

Carnatic music can be thought of as an organized system of music, in the red to the strict mathematical relation between the fundamental note 'S' and the other swaras (Sambamurthy 1983). As already discussed, Indian music differs from its Western counterpart, in being just tempered with varying pitch and varying intervals of octave. Furthermore, Carnatic music differs from other Indian systems of music mainly due to the presence of microtones, Gamakas, style of representation etc. The essential components of Carnatic music are the Tala, Shruthi, Raga and Gamaka and are discuss in the next sections.

A. Tala

The Tala is an important component that provides rhythm on the way to the music, which is a single characteristic of Indian music, but it is different for the Hindustani and Carnatic systems of music. In Hindustani music, Talas have a vocalised (and therefore recordable) form wherein individual beats are expressed as phonetic representations. The Tala is indicated using hand gestures by beating on the lap. The Tala of Hindustani music is typically played in three tempos: Vilambit (slow), Madhya (medium) and Dhrut (Fast). Hindustani music is typically accompanied by the Instrument Tabla to keep track of the Tala used. On the other hand, in Carnatic music a Tala is defined as the periodic series of a beat. Every song in Carnatic music is associated with a Tala. A Tala is indicated using hand gestures with tapping on the lap and counting using fingers In Carnatic music the Tala is kept track of using the Instrument Mridangam or Thavil. It is also a convention that the input song will be an integral various of a Tala. The input song can have one or more Ragas associated with it, but still will cater to only one Tala.

B. Raga and Shruthi

The seven swaras S, R, G, M, P, D, N associated with Carnatic music as discussed earlier are analogous to the C, D, E, F, G, A, B in the Western upright The seven remarks of Western music correspond to single octave. The relation

between the frequencies of two adjacent notes is denoted as an interval[2]. Hence the seven observations of an octave correspond to 12 intervals which indicate 12 distinct discrete frequencies. Researchers have put forth differing ideas on the assignment of keys and their intervals (Krishnasamy 2004). The a large amount accepted theory seems to be the idea of 22 Srutis for an octave (Krishnasamy 2004); however, other possible intervals of an octave that are under conversation include 24, 27, 32, 48, 53 and 96. This theory of 22 intervals has a connection to ancient Indian text on music, which gives it a mystic attraction

C. Gamakas

Another important component of Carnatic music is the Gamaka, which is clear as position inflexion. In Carnatic music, every swara further than 'S' and 'P' can take Gamakas. If a particular swara take the Gamaka for a Raga, then that swara is defined as one that takes a continuous frequency range which is defined around the discrete frequency of that swara. This concept of the Gamaka is an decoration to a Raga, and is specifically designed for a given swara in a Raga. The choice of frequencies that a particular swara can take also varies between two Ragas.

III. EXISTING WORK

Two major areas of audio signal processing are Speech and Music signal processing. Speech signal processing includes speech recognition and synthesis, speaker identification and verification[1] ,etc (Rabiner and Juang 1993). As far as music signal processing is troubled the areas of research include composition synthesis, transcription, categorization, music content study, Instrument and voice identification, summarization, etc[2]. Content-based music retrieval forms a major research topic in audio content analysis like rhythm (Lin et al 2009), melody (Schulkind et al 2003) etc. and this area of research is ahead consideration (Tzanetakis 2003).

A. BLOCK A SIGNAL PROCESSING SYSTEM

The basic modules include Pre-processing, Segmentation, characteristic removal, Model Construction and decoding to help identify the components of the input indicator. A good quality set of features together with a forceful model, will help in correct content identification of any signal. This division discuss the work that has been carried out in various modules of music signal processing towards content identification.

B. PRE-PROCESSING

The pre-processing phase of a signal giving out system consists essentially of Noise Removal and Signal separation (Stern 2005).

a. Noise Removal

Typically, noise is removed from speech signals to increase the performance of the system (Stern 2005). However, performing noise removal for processing music signals generally results in removing important information content, and hence, during music processing noise is not removed from the input (Klapuri and Davy 2006).

b. Signal Separation

The next module of pre-processing for speech and music processing is Signal separation[9]. Signal separation can also be thought of as source separation, and can be defined as the process of identifying and isolating the various signals present in a mixture of sound signals[9]. This process of Signal separation can be applied to speech and music.

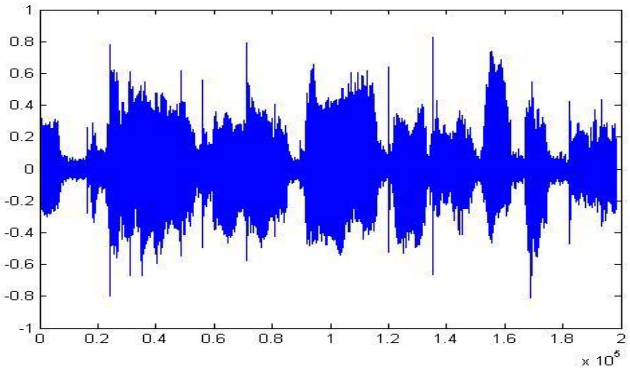

Figure 1: Input signal separated, segmented

C. SEGMENTATION

In general, audio segmentation algorithms are divided into two categories: Model-based algorithms since well as Novelty-based algorithms. Modelbased algorithms equivalent the path of the attribute values with a pre-defined model for identifying and labelling the hearing part, as the originality based algorithms identify abrupt changes in the trajectory of the feature values alone to decide points of segmentation (Aucouturier et al 2005).

IV. MUSIC INFORMATION RETRIEVAL

One of the basic thoughts behind determining the content of the music signal was its use as key values for indexing in a Music Information improvement system[2]. In the there situation, several algorithms have been used for indexing, other than only of the established methods is a hash table like configuration with more than single segment. One such hash

table construction is the dual-ternary indexing algorithm (Jiah and Chang 2008). In this attempt, we have chance a adjustment to the existing dual ternary music indexing algorithm. so, I enclose future the Multi-key hash algorithm for indexing, that would have a number of segmentation algorithm[4], and had a better time difficulty with development in accuracy and recall for recovery. The Multi-key hashing algorithm is comparable to any hashing algorithm when there is no collision.

V. RESULTS

The input signal is illustration at 44.1 KHz. We imagine the organization of three melakarta Ragams for the purpose of evaluating this algorithm. For the reason of Raga group we have considered songs sung by similar to Nithyasree, M.S.Subalakshmi, Balamuralikrishna as bright as Ilayaraja. Beginning cry in run we have standard their fundamental frequencies at what bottle 400 Hz, 320 Hz, 400 Hz and 240 Hz in to position. We calculated songs to be in the exact rest in the direction of melakarta ragas, Sankarabharanam, Kayaking, Karaharapriya raga and belonging to Adi talam or Ropak Talam. We absolute the indicator to overtake from side to side the signal separation algorithm, and segmentation algorithm. The effect presentation the segmentation points for one input is given missing in Fig 1. This is the primary rank of segmentation where the protruding lines indicate the point of segmentation. Following build out the segmentation position we decide the frequency components using the HPS algorithm and tabulated the frequency values which have the central energy. The result is shown in Figure 2

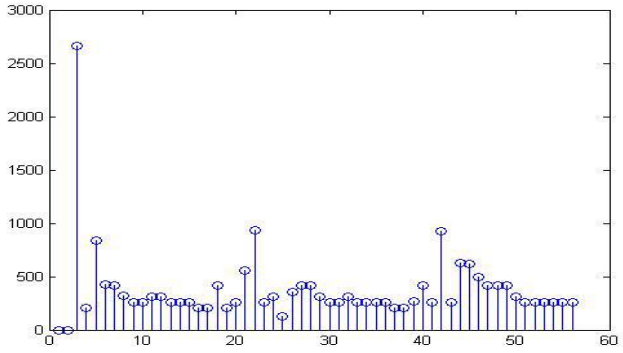

Figure 2: Frequency components

VI. CONCLUSION

The system has to be tested for different singers, all melakarta Ragas and ten most frequently occurring talams. This system's basic disadvantage is the assumption of fundamental frequency and hence determination of fundamental frequency is our next task. The system has to be modified to use the identified raga to index songs and use raga as a query for music information retrieval.

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REFERENCES

[1] Rajeswari Sridhar and T.V. Geetha, "Swara identification of Carnatic music", IEEE Computer Society press, proceeding of ICIT 2006
[2] Rajeswari Sridhar and T.V. Geetha, "Music Information Retrieval of Carnatic Songs Based on Carnatic Music Singer Identification", IEEE conference on Computer Science, ICCEE 2008
[3] Gaurav Pandey, et al "Tansen: A system for automatic Raga identification" IICAI, 2003
[4] Rajeswari Sridhar and T.V. Geetha, "Comparison of signal separation algorithms as applied to Carnatic music", FRSM 2007
[5] Rajeswari Sridhar, Geetha T. V, "Swara Identification for South Indian Classical Music", ICIT '06 Proceedings of the 9th International Conference on Information Technology, IEEE Computer Society, ISBN:0-7695-2635-7.
[6] Ram Avtar Vir, "Theory of Indian Music" Pankaj Publications, New Delhi, 1999.
[7] Preeti Rao and Anand Raju, "Building a melody retrieval system", NCC 2002
[8] Maarten Grachten et al, "Melody retrieval based on the Implication Realization model", MIREX 2005
[9] Mark R Every & John E Szymanski, "A Spectral Filtering approach to music signal separation", Proceedings of the 7th International Conference on Digital Audio Effects (DAFx '04), Naples, Italy, October, 2004, pp 197 – 200.