West Indian Folk Music Analysis

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Abstract:
This paper extract the features of folk music of west region of India with consideration of elements of music such as duration, dynamics, harmony, melody, structure, texture and timbre of folk songs. This paper also helps to improve the performance of the folk songs.

Keywords: Dynamics, Harmony, Melody, Structure

Introduction:

Maharashtra is west region of India with its great music tradition. In rural community of Maharashtra many occasions are celebrate with music and dance. This music has various forms such as devotional music, folk music and classical music. Folk music is exceedingly famous in Maharashtra like Povada, Lavni, Bhaleri, Owi, Abhangas, Kirtan, Lalita, Tumbdi, Bharud and Gondhal. These are main and trendy folk songs to engross rural community.

Mostly Indian folk music has a raw sugariness that is hard to define. Numerous mystical sounds heard in folk music across India are because of unique arrangement and assembly of handmade instruments. This type of music is not easy to analyze. Any music can be composed at several layers using following elements that describe style or type of music.

- **Duration**: Define length of song
- **Dynamics**: Define sound of song
- **Harmony**: Vertical arrangement of song
- **Melody**: Horizontal arrangement of song
- **Structure**: Define section of song
- **Texture**: Define music density

In this paper we were able to find all above values using computing techniques.

Music Analysis System:

In this system 250 West Indian folk songs are stored in database. This system was divided into four tools to extract the information of West Indian folk music. To analyze folk songs we need music sheet. With ScoreCloud Studio, notation appears automatically when we play any songs from the database. First tool was used to find duration and tempo of folk music using Mutagen. It was a Python module to handle audio metadata.

Second tool was used to classify soft or loud volume of folk songs using Hidden Markov Model. This model was implemented in python. The classification of dynamics is as follows

Dynamic Level	Meaning
p or piano	soft
f or forte	loud
mp	moderately soft
mf	moderately loud
pp	very soft
ff	very loud

Third tool was used to classify melody of folk music using Hidden Markov Model. The Baum-Welch reestimation method was implemented to train a hidden Markov Model for each category of songs of an unknown melody. The Viterbi algorithm was used to decode the sequence and compute the log probabilities using trained data for different songs. We assign the melody to the categories of the songs with highest log probability.

Fourth tool was used to find structure of folk music. Musical Structure describes how a piece of music is constructed in terms of distinct sections within the piece. This shows rhythm, timbre and chroma of music. Firstly the rhythm structure of the music was analyzed by detecting note onsets

and the beats. The music is segmented into frames with the size of inter-beat time length. We call this segmentation method as beat space segmentation. Secondly, a statistical learning method was used to identify the melody transition via detection of chord patterns in the music and detect singing voice boundaries. Finally, with the help of repeated chord pattern analysis and vocal content analysis, the music structure is detected. Every generated data such as Duration, Dynamics, Melody and structure of music were stored in database.

Result:

In Musical Analysis System, First tool was able to detect duration of different folk songs. Second and third tools were able to classify the volume of sounds and melody with an accuracy of 90% and 67% respectively .The Classification problem becomes harder when we stored more different types of West Indian folk songs.

Conclusion:

Folk music was stored in MIDI format. Two classification methods were used. These two classification methods were based on histograms to represent folk songs and achieve a classification accuracy of about 90% and 70% respectively. Using these data we can improve the structure of folk music.

Future Work:

In future work would include detection of the texture and harmony of West Indian folk music.

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