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A Proposed Model to Create Playlist Based On Mood for Bollywood Songs

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ABSTRACT

The Kind of music I like is depended on my Mood. Music is collection of many features which affect our Mind and Heart. Recently lots of research is done on music related to retrieval of information or classification of music according to various features like pitch, lyrics. In this paper we Suggested a protype / Model for a music system which generate a playlist according to listener's mood. There are variety of music but we initially choose bollywood music for our research. Our research work includes to identify the features of music which affect the mood of Human, study of previous related work and enhance the previous work model. It also includes some analysis of data mining techniques useful for music features related data set.

This research will help in the treatment of many diseases which is treated by Music Therapy and in MIR System.

Keyword:- MUSIC, MOOD, MUSIC-THERAPY, MIR

I. INTRODUCTION

Music is Proportional to our mood. Music selection is reflection of our mood. Many research papers have pointed the effect of music on human body. Music provide the solution for heart rate variability ,Pulse rate Variability , blood pressure , Lower Stress ,Relieve anxiety & depression, encourage recovery from heart attacks[1]. This medical need inspired me to design a system which recognize the music according to emotion. There are many music system which discriminate music or songs according to names, genres, albums, artist. Or arrange the songs according to time, artist, and movie. This discrimination is not very much useful because listeners want to hear according to their mind state or mood. Music and mood both are related. Music can change the mood positively and Positive mood is more creative and do better work [2].

In this paper we provide a solution to make a playlist in music system according to mood. Or try to enhance the previous work. Whole paper is divided in three segments. Segment one consider the related work which is previously done by other scientist or scholars. Segment two proposes an algorithm to classify the music list according to mood. Segment three justify the segment two. Give some analysis report for proposed system. After that in this we conclude our whole paper and write the information about the future work.

II. LITERATURE REVIEW

Many Philosophers and experts classify the mood and give different models. Hevner[3] categorize all emotions in eight adjectives . Russell [4] divide the emotion on the quarter or circle basis, categorize mood in four category. Thayer [5] describes mood by two dimensions Stress dimension and Energy Dimension, according to this emotions split into four cluster Anxious, Exuberance, Depression, Contentment. JungHyun and team[6] divided music mood in 8 region by using kmeans clustering algorithm. Many researches have been done to discriminate music on the basis of mood. Some researchers have taken different features and algorithms. Initially music is classified according to Lyrics.

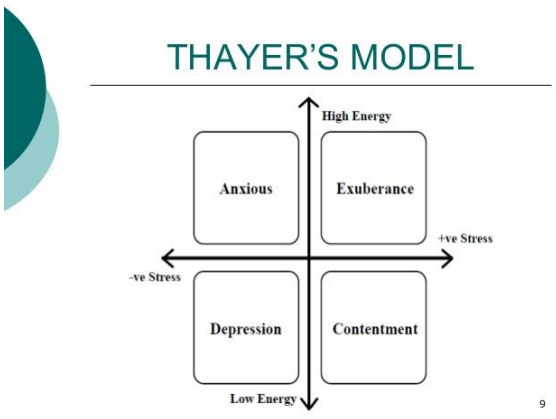
Menno Van Zaanen and Pieter Kanters[7] present a study in which they classify the music according to mood by choosing Lyrics as attribute and used machine learning. Lie and his team [8] present a study in which first classify the music in two groups, Speech and non-speech music. And again non-speech in music and environment music and an algorithm based on kNN and LSP-Vq is developed. Guodong Guo and Stan Z. Li[9] propose a study in which they classify the music by using support vector machine algorithm and achieve lower error rate compare to other algorithms on basis of content.

Pasi Saari and his team[11] present a study in which to improve the classification performance propose the wrapper selection approach. Kyogu Lee and his partner[12] present that classification of music on the basis of mood related to user's profile because mood depends on age and gender. Wen Wu and his partner [10] give a study of mood classification for Chinese traditional music. They took audio clips and two mood models, with the help of Bayesian network, classify audio clips into different mood category and took timber, pitch and Rhythm as core feature for classification. Amey Ujlambkar and his team [13] propose a system which is combination of all previously proposed system choose timbre, pitch and rhythm as key feature , they used classifier and clustering both in their system.

This study 70 percent success ratio to classify Bollywood music. Kunjal Gajjar and Siddhi Shah [14] propose a system in which they have taken mood-music categorization from social networking site. This algorithm has some limitation for larger data. Jia-Min Ren and his team have done music mood classification by choosing timbre and modulation features with help of support vector machine training approach.

III. PROPOSED ALGORITHM

a) **Mood-Model**: There are several music models Hevner' model, Russell's model, and Thayer's model. To identify the mood, we choose Robert Thayer model [17]. Thayer describes mood by two dimensions stress dimension and energy dimension according to this split into four clusters Anxious , Exuberance , Depression , Contentment.



Pic 1: Thayer Mood Model

b) **Audio-Features**: Selected audio features are listed below:

I. Pitch: Pitch of an Audio is an emotional characteristics [18]. Pitch is indirectly or directly related to log of frequency. Pitch is basically related to these two features FFT and inharmonicity.

II. Timbre: Sound quality of an audio file is related to Timbre and Timbre can be measured by Zero crossing , Spectral Irregularity and Roughness.

III. Rhythm: It is audio feature which is related to Time. Tempo , Fluctuation , Beat, Beat Spectrum are collectively known as Rhythm.

IV. Intensity: Power and frequency of an audio is known as Frequency.

V. Lyrics: if we add Lyrics as one more feature for classification so the above discussed audio features and Lyrics combination obtained balance ness between accuracy and fuzziness [19].

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Feature	Related Features
Intensity	Power , frequency
Rhythm e	Tempo, Fluctuation, Beat Spectrum
Timbre 1	Zero Crossing , Spectrum irregularity, Roughness
Pitch	FFT, Inharmonicity

Summary of Audio Features

c) **Tools Used:** There are various tools available for to collect the features from audio. We Choose jAudio freely available & open source tool for Feature extraction [21].

d) **Data mining Techniques:** There are several techniques are available to classify the data set or for clustering purpose. Supervised and unsupervised are basic two types. Basically classification is related to supervise learning. There are multiple

algorithms of classification like neural network, decision Tree, Naïve Bayesian algorithm. One can choose these algorithm according to their need or requirement. Because every algorithm has some advantages and limitations. To classify our work we can choose any of these algorithm but initially we found that Decision Tree and Naïve Bayesian are best suited for this application.

IV. RESULT ANALYSIS

We choose Thayer's Model because it is easy to understand and successfully classify mood.

Before this work a lot of research done in this area which selects Timbre, Pitch, Rhythm as key features. Some studies select low level and high level features set. Some studies select intensity and maximum work in this area is done by recognizing lyrics. This will be good approach comparatively all other because we have taken more key features for classification.

We will use jAudio for features extraction and Weka for implementing data mining techniques. These two are freely available and open source software , so it will give new platform for new scholars.

We will use Naïve Bayesian Algorithm for classification. This is supervised learning techniques .It gives high accuracy and fast access on large database [22]. It gives you minimum error rate. Its implementation is easy.

V. CONCLUSION & FUTURE SCOPE

This paper Present a study on various available models for mood-based playlist generation. It includes the brief notes about the previously discussed study and proposed model. Our full focus is to classify only Bollywood song. Bollywood song is much more dependent on content or lyrics. So by adding lyrics as core feature we will improve classification and everyone stores multiple songs or everyone has large huge database of songs. With the help of naïve Bayesian we will access songs speedily and we will minimize error rate.

REFERENCES

[1] Rollin McCraty, Bob Barrios Choplin, Mike Atikinson and Dana Tomasino , "The effect of different types of music on mood, Tension & Mental Clarity" , Alternative therapies , vol 4, pp 75-84 , jan 1998

[2] Ruby T. Nadler, Rahel Rabi, John Paul Minda. Better Mood and Better Performance: Learning Rule Described Categories Is Enhanced by Positive Mood. *Psychological Science*, 2010; 21: 1770-1776
DOI:10.1177/0956797610387441

[3] Kate Hevner, (1936). Experimental studies of the elements of expression in music. *American Journal of Psychology*, Vol. 48, pp. 246-268.

[4] James A Russell, "Measures of emotion", Emotion Theory Research and Experience, vol. 4, pp 83-111

[5] Thayer, R. E., The Bio-psychology of Mood and Arousal", New York: Oxford University Press, 1989.

[6] JungHyun Kim, SeungJae Lee, SungMin Kim , WonYoung Yoo ," Music Mood classification model based on Arousal valence values" , ICACT-2011 pp 292-295

[7] Menno Van Zaanen and Pieter Kanters. "Automatic Mood Classification Using TF* IDF Based on Lyrics." ISMIR. 2010.

[8] Lie Lu,Hong-Jiang Zhang and hao Jaing ," Content analysis for audio classification and segmentation" , IEEE Transactions on speech and audio Processing, vol 10 no. 7 oct 2002

[9] Guodong Guo and Stan Z. Li ," Content-Based Audio Classification and Retrieval by Support Vector Machines" , IEEE TRANSACTIONS ON NEURAL NETWORKS, VOL. 14, NO. 1, JANUARY 2003

[10] Wen Wu, Lingyun Xie," Discriminating Mood Taxonomy of Chinese Traditional Music and Western Classical Music with Content Feature Sets", 978-0-7695-3119-9/08 $25.00 © 2008 IEEE DOI 10.1109/CISP.2008.272

[11] Pasi Saari, Tuomas Eerola, and Olivier Lartillot , "Generalizability and Simplicity as Criteria in Feature Selection: Application

[12] to Mood Classification in Music" , IEEE TRANSACTIONS ON AUDIO, SPEECH, AND LANGUAGE PROCESSING, VOL. 19, NO. 6, AUGUST 2011
[13] Kyogu Lee and Minsu Cho, "Mood Classification from Musical Audio Using User Group-dependent Models", 978-0-7695-4607-0/11 $26.00 © 2011 IEEE DOI 10.1109/ICMLA.2011.96
[14] Amey Ujlambkar1, Omkar Upadhye2, Akshay Deshpande3, Gunwant Suryawanshi4," Mood Based Music Categorization System for Bollywood Music" , International Journal of Advanced Computer Research (ISSN (print): 2249-7277 ISSN (online): 2277-7970) Volume-4 Number-1 Issue-14 March-2014
[15] Kunjal Gajjar and Siddhi Shah[14] ,Mood based Playlist Generation for Hindi Popular Music: A Proposed Model, International Journal of Computer Applications (0975 – 8887) Volume 127 – No.14, October 2015
[16] Jia-Min Ren, Ming-Ju Wu, and Jyh-Shing Roger Jang," Automatic Music Mood Classification Based on Timbre and Modulation Features", IEEE TRANSACTIONS ON AFFECTIVE COMPUTING, VOL. 6, NO. 3, JULY-SEPTEMBER 2015
[17] Aathreya S. Bhat, Amith v. s, Namrata S. Prasad, Murali Mohan D. ," An Efficient Classification Algorithm For Music Mood Detection In Western and Hindi Music Using Audio Feature Extraction", 2014 Fifth International Conference on Signals and Image Processing, 978-0-7695-5100-5/13 $31.00 © 2013 IEEE DOI 10.1109/ICSIP.2014.63
[18] Jared S. Bauer, Alex Jansen , Jesse cirimele , "Mood Music: A method for cooperative, Generative Music Playlist creation" , IJIST, 2011
[19] David Gerhard ,"Pitch extraction and Fundamental Frequency : History and current Techniques" ISSN 0828-3494
[20] Aditi Jamdar, Jessica Abraham , Karishm Khanna & Rahul Dubey , "Emotion analysis of songs based on lyrical & audio features" , IJAIA, vol
[21] Daniel McEnnis , Cory McKay , Ichiro Fujinaga , Philippe Depalle , "JAUDIO: A FEATURE EXTRACTION LIBRARY" , c 2005 Queen Mary, University of London
[22] Sumit Garg, Amit Kr. Sharma, "Comparative Analysis of Data Mining Techniques on Educational Dataset" ,International journal of computer Applications (0975 – 8887) Volume 74– No.5, July 2013