ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 1, January 2016

A Survey on Novel Hybrid Recommendation Mechanism for Mobile Query Retrieve Effective Results Ranking By Singing/Humming

Pranaya Sudrik[1], Nalini Langhe[1], Pranali Phanase[1], Mosmin Sayyed[1], B.Padmavathi[2]

B.E. Student, Dept. of Computer, GHRCEM, Pune University, Maharashtra, India[1]

Assistant Professor, Dept. of Computer, GHRCEM, Pune University, Maharashtra, India[2]

ABSTRACT: If a user wants to listen a song and he/she is unable to recognize the title of a song or its related details, then the most direct and convenient method to search for the song is, by humming a section of it, by this approach user will feel more delightful. In the existing system, Query by Singing/Humming make use of signal processing or music comparison methods. Also user's background may get influenced towards the genres of the songs being searched. In our study we use the information from the users own database as well as the properties of genres common to users with similar background. To estimate the genres current user may be interested is based on probability calculation, by this the efficiency of querying by singing/humming is improved. Our system is divided into two phases. The first phase is to search for possible results within music database, while in thesecond phase the musical preference of the user is utilized to rank the possible results again. Songs that are most likely listen by user would be positioned at the start of the list in the search result. Through our experiments we confirmed that the method proposed can significantly improve the search accuracy.

KEYWORDS: MusicDatabase,MusicInformation Retrieval, GeneticAlgorithm, Query ranking.

I. INTRODUCTION

In today's modern world most demanding devices used are smart phones and tablets that has led to the rapid development of various applications. One of the most common applications is listening to music. Consumers can now use mobile device to play any type of music anywhere, anytime. For example, when they are exercising or driving. But the problem occurs for automatic playlist creation, music order or search. For searching the song, one can use a songs metadata (for example, song title, artist, publication date, etc.),or the content of the music file (melody). A user can easily search for a song through a voice recognition system. In order to perform a search, the user can call out the song title or artist detail. As a result the recognition system recognizes the voice content to process the search. But technologies for this system already exist. For example Siri by Apple or the voice recognition system by Google.From the first query by humming system to day, many systems have appeared. Most of these systems use Midi representation of the songs or they process the songs to obtain a symbolic representation of the main voice or, also, these systems may use special formats such as karaoke music or other hummings to obtain the Midi or other symbolic representation of the main voice of the songs in the database. In all the cases the main voice or main melody must be obtained because it is the normal content of the humming. Somehow, the normal query by humming systems are based on the melody transcription of the humming queries to be compared with the main voice melody obtained from the songs in the database.

Query by humming (QBH) is one of the most natural content-based MIR methods, which takes a fragment of melody hummed, singed or whistled by users via microphone as query to search music. QBH system mainly contains following components: i) automatic query transcription module which transforms the acoustic input into note sequence or melody contour; ii) melody representation and indexing module for music in database; iii) searching and matching module that retrieves related melodies from database, carries out similarity measurement between query and indexed melodies, then return a ranked list of candidates to users.

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 1, January 2016

We deal with symbolically encoded, polyphonic music for which we use the pitch-against-time representation of note-on information, as suggested. The musical works in a database are concatenated in a single geometrically represented file, denoted by T. Inatypical case the query pattern P to be searched for is often monophonic and much shorter than the database T to be searched. If P and T are readily not given in the lexicographic order, the sets can be sorted in |P| log |P| and |T| log |T| times, respectively. The problems of interest are the following:
(P1) Find translations of P = p1,p2.....,pm
Such that each point in P match with a point in T = t1,t2...tn (pi,tj∈R2,for 1 = i, j< = m, n).
(P2) Find translations of P that give a partial match of the points in P with the points in T.

II. RELATED WORK

When a user cannot remember the title of the song or its related details, then just humming the section of that song should work. Digital music is produced in large quantities and rapidly distributed over the Internet. Methods to quickly retrieve a song have been an important research topic in the area of music information retrieval (MIR). The two primary MIR methods are keyword-based retrieval and content-based retrieval. Keyword-based retrieval often uses text to perform song searching (for example, the artist name, title of the song, etc.).The audio information of the song is not required. In comparison, content-based retrieval uses the audio information, including tone, pitch, and rhythm as the basis to perform the search operation.Pitch tracking and note segmentationSounds that are perceived as having pitch are made up of a number of recurring pitch periods. Algorithms for identifying the pitch of an acoustic signal may be classifiedby whether they work in the time domain, by examining the structure of the sampled waveform, the frequency domain, by examining the spectrum generated by a Fourier transform, or the cepstral domain, by performing a second Fourier transform on the log amplitude spectrum and examining the resultingcepstrum (Hess, 1983). MT uses the Gold-Rabiner algorithm, a time domain algorithm which assigns pitch by finding the repeating pitch periods comprising the waveform (Gold and Rabiner, 1969). Figure 1 shows 20 ms of a typical wave form for the vowel ah, as in father. Our implementation of the algorithm breaks the input sound into 20 ms frames and returns a pitch estimate for each frame.
The Singing / Humming Signals Process**:**
A hand-held microphone is used to record the audio signals of a user after the user sang or hummed the song. The resolution of the signal is con figured as an 8-bit mono channel with a sample rate of 11025. A low pass filter at 1047 Hz is used to reduce noise and filter high frequency signals before further processing. We apply a fixed noise gate to determine the end-point of notes for signals generated by singing/humming in order to segment the notes. In other words, when the energy level is constantly lower than the con figured threshold, the energy interval is considered to be a no-pitch interval. A no-pitch interval begins at the end of a certain note, where this end position is the start position of the next note. In Fig. 2 the audio wave diagram representing the input signals from a user singing/humming a melody is shown. The red columns determine the positions of notes detected by their energy level. We use to represent each note segment after cutting.

III. SYSTEM ARCHITECTURE

The system is divided into two phases. The first phase is to search for possible results within the music database, while the second phase re-ranks the search results based on user preferences.

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 1, January 2016

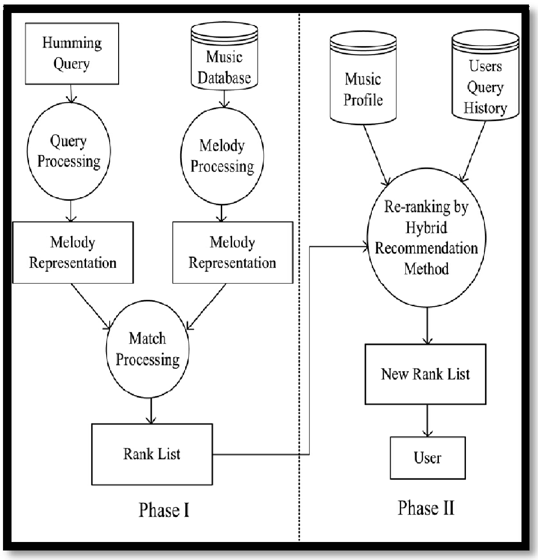

Fig.1.System Flow chart

A simple flow chart of the system is shown in Fig.1.In phase one, the conventional method of query by the singing/humming is used. The segments sang/hummed by a userare compared with music files in the database. These music files are in an appropriate format in order to perform the comparison. Possible search results are output based on the calculated matching rate. Using this method, many music files from genres that are impossible to be queried by the user are displayed. In addition, the actual music file required may be positioned further back in the search results, causing inconvenience during operation.In previous related research, query by singing/humming and music recommendation are two major topics, where each has its own area of development. We have attempted to combine the two technologies for music recommendation into our query by singing/humming system. This improves the search accuracy for query through singing/humming.

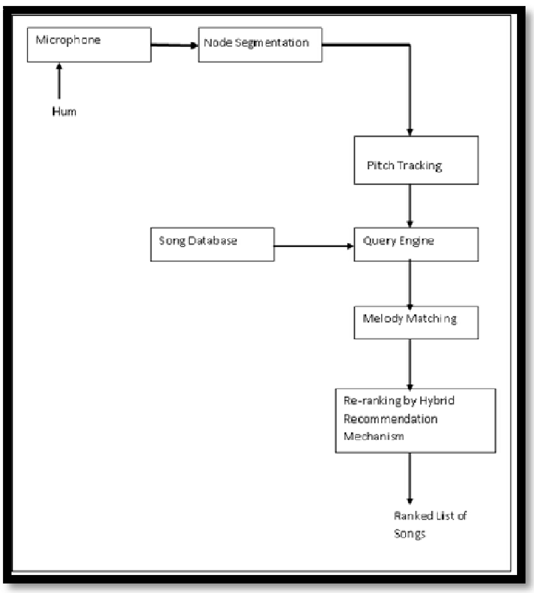

Fig.2.Proposed System Architecture

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 1, January 2016

PROPOSED SYSTEMARCHITECTURE

In our proposed System we are using microphones to give an input to the system. It is as simple as the user would just hum the required song using the microphone. No more details are needed to be given like song name, Singer name, Title, Album name etc. This makes song searching too easy and handy. Microphones input which is analog in nature is then converted to digital form using Sampling and Quantiztion. The input is then segmented into small small nodes. All this small nodes are then pitch tracked using pitch tracking Algorithms. Pitch tracking helps to detect amplitudes of the signals. The Query Engine processes the segments and checks for melodies in the database. Thus helping to check different melodies separately in small small segments.

This all comes under first phase. The second phase goes with users preference history. Each and every users Data is stored along with their details and Song histories.

IV. CONCLUSION

The method of querying by singing/humming is the most natural and simple technique to perform music search. In our study, we use previous search histories of the users as well as users from similar backgrounds to perform probability calculations. This improves the rate of success, such concepts often appear in system design recommendations. Through our experiments, we confirmed that the methods proposed can significantly improve the search accuracy.

REFERENCES

1. M. Schedl, G. Widmer, P. Knees, and T. Pohle, “A music information system automatically generated via Web content mining techniques,”I n f . Process. Manage., vol. 47, no. 3, pp. 426–439, May 2011.
2. O. Cornelis, M. Lesaffre, D. Moelants, and M. Leman, “Access to ethnic music: Advances and perspectives in content-based music information retrieval,” Signal Process., vol. 90, no. 4, pp. 1008–1031, Apr. 2010.
3. K. Lemström, N. Mikkilä, and V. Mäkinen, “Filtering methods for content-based retrieval on indexed symbolic music databases, Inf.Retriev” vol. 13, no. 1, pp. 1–21, Feb. 2010.
4. A. J. Ghias, D. C. Logan, and B. C. Smith, “Query by humming-musical information retrieval in an audio database,” in Proc. ACM Multimedia’95, San Francisco, CA, USA, 1995, pp. 216–221.
5. R. J. McNab, L. A. Smith, I. H. Witten, C. L. Henderson, and S. J.Cunningham, “Toward the digital music library: Tune retrieval from acoustic input,” in Proc. ACM Digital Libraries, 1996, pp. 11–18.
6. X. Yang, Q. Chen, and X. Wang, “A novel approach based on fault tolerance and recursive segmentation to query by humming,” Adv. Comput. Sci. Inf. Technol., vol. 6059, pp. 544–557, 2010.
7. J. Qin, H. Lin, and X. Liu, “Query by humming systems using melody matching model based on the genetic algorithm,” J. Softw., vol. 6, no. 12, pp. 2416–2420, Dec. 2011.
8. J. Li, L. M. Zheng, L. Yang, L. J. Tian, P. Wu, and H. Zhu, “Improved dynamic time warping algorithm the research and application of query by humming,” in Proc. IEEE 6th Int. Conf. Natural Computation (ICNC), Aug. 2010, pp. 3349–3353.
9. P. Hanna, P. Ferraro, and M. Robine, “On optimizing the editing algorithms for evaluating similarity between monophonic musical sequences,” J. New Music Res., vol. 36, pp. 267–279, 2007.
10. S. Doraisamy and S. Rüger, “Robust polyphonic music retrieval with N-grams,” J. Intell. Syst., vol. 21, pp. 53–70, 2003.
11. R. Typke, R. C. Veltkamp, and F. Wiering, “Searching notated polyphonic music using transportation distances,” in Proc. ACM Int. Conf.Multimedia, Oct. 2004,pp.128–135.
12. J. Urbano, J. Lloréns, J. Morato, and S. Sánchez-Cuadrado, “Using the shape of music to compute the similarity between symbolic musical pieces,” in Proc. Int. Symp. Computer Music Modeling and Retrieval,Jun. 2010, pp. 385–396.
13. J. Urbano, “MIREX 2013symbolic melodic similarity: A geometric model supported with hybrid sequence alignment,” Technical report, Music Information Retrieval Evaluation eXchange,2013.
14. R. Bellman, Dynamic Programming. Princeton, NJ, USA: Princeton Univ. Press, 1957.
15. C. C. Wang, C. H. Chen, C. Y. Kuo, and J. S. R. Jang, “Improving query by singing/humming systems over GPUs,” in Proc. IEEE 41stInt. Conf. Parallel Processing Workshops(ICPPW), Sep. 2012, pp.561–567.