Tag Based Audio Search Engine

Parameswaran Vellachu[1] and Dr. Sunitha Abburu[2]

**[1] Master of Computer Applications, Adhiyamaan College of Engineering
Hosur, Tamilnadu - 635 109, India.**

**[2] Professor and Director, Department of MCA, Adhiyamaan College of Engineering
Hosur, Tamilnadu - 635 109, India.**

Abstract

The volume of the music database is increasing day by day. Getting the required song as per the choice of the listener is a big challenge. Hence, it is really hard to manage this huge quantity, in terms of searching, filtering, through the music database. It is surprising to see that the audio and music industry still rely on very simplistic metadata to describe music files. However, while searching audio resource, an efficient "Tag Based Audio Search Engine" is necessary. The current research focuses on two aspects of the musical databases 1. Tag Based Semantic Annotation Generation using the tag based approach.2. An audio search engine, using which the user can retrieve the songs based on the users' choice. The proposed method can be used to annotation and retrieve songs based on musical instruments used , mood of the song, theme of the song, singer, music director, artist, film director, instrument, genre or style and so on.

Keywords: *Audio search engine, Film Songs, Tags, Annotation.*

1. Introduction

Since media is the plural of medium, the term "multimedia" is used to describe multiple occurrences of many forms of media such as a collection of audio CDs. This is why it's important that the word "multimedia" is used exclusively to describe multiple forms of media and content. Audio is one of the parts in multimedia technology. Audio is sound within the acoustic range available to humans. An audio frequency (AF) is an electrical alternating current within the cycles per second range that can be used to produce acoustic sound. Audio files are usually large; they must be compressed in order to be delivered on the web. The most common compression type is MP3. Since the development of MP3 compression, several web sites have become available for downloading MP3 audio files. Some sites, like Napster, http://www.napster.com/ offers search engines for any MP3 files.

Audio has a greater role to play in multimedia development. It gives life to the static state of multimedia. Audio is one of the most important features of multimedia. Incorporation of audio is one of the most important features of multimedia, which enhance the multimedia usability to its full potential. All these can be used in any combination as long as they give some meaningful tags.

Audio is mostly used in Cinema Industry, Musical Companies, Radio, television etc. The Audio Files category includes compressed and uncompressed audio formats, which contain waveform data that can be played with audio playback software.

This category also includes MIDI files, musical scores, and audio project files.

Common audio file extensions include .WAV, .AIF, .MP3, and .MID.

Extension	File Description	Popularity
.4mp	4-MP3 Database File	Average
.669	UNIS Composer 669 Module	Uncommon
.6cm	Six Channel Module	Rare
.8cm	Eight Channel Module	Rare
.8med	Amiga OctaMed Music File	Rare
.8svx	Amiga 8-Bit Sound File	Average
.a2m	AdLib Tracker 2 File	Average
.a52	Dolby Digital Audio File	Rare
.aa	Audible Audio Book File	Common
.aa3	ATRAC Audio File	Common
.aac	Advanced Audio Coding File	Uncommon

.aax	Audible Enhanced Audiobook File	Average
.ab	Ambling BookPlayer MP3 File	Uncommon
.abc	ABC Music Notation	Average
.abm	Music Album	Average
.ac3	Audio Codec 3 File	Average
.acd	ACID Project File	Common

Table 1: Audio File Extensions

The importance of music databases has been recognized through the progress of music files retrieval technologies and benchmarks. Since the year 2000, some large-scale music databases have been created, and they have had a strong impact on the global research area [11]. Music database contains many different types of music. The database includes a significant amount of commercial music, although independent music can certainly play a role as well. The vast majority of end users are interested primarily in professionally produced music. Music files systems must demonstrate that they are able to deal with such music. Each recording should be annotated with as diverse range of metadata fields as possible in order to make the database usable as ground truth for as wide a range of research as possible.

2. Literature Review

An audio search engine retrieves music from databases, many approaches rely on query-by-example methods where the query must consist of a piece of information that has a representation similar to the records in the database, e.g. in query-by-humming/singing systems. Since users are accustomed to text-based search engine, which have become the “natural” way to find and access all other types of content like .mp3, .midi, .amr, .mp4, .wmv.

The majority well-known format of audio metadata is probably id3 tags that are present in MP3 files. This is a de facto standard initially created by an individual [1]. The nature of the id3 tags is basically to supply common explanation of the audio file, such as instruments, artist, genre, etc. This is what most audio metadata formats are likely to do, along with digital rights management. But feature based audio tagging can bring much more than really categorize songs and albums by genre, instruments and artists.

Various methods to retrieve music from large databases have been proposed. The majority of these approaches are based on query-by-example methods. One of the central challenges of [3] method is to assign semantically related information to individual music pieces. To create tag based audio search engine for large music collection that can be queried all the way through natural language text input.

These categorization systems successfully “tag” music with class labels (e.g., “blues”, “sad”, “guitar”). More freshly, auto tagging systems have been developed to annotate music with a bigger, more diverse vocabulary of (non-mutually exclusive) tags [4].

The goal of query-by-singing/humming (QBSH) task is to evaluate the MIR systems which retrieve songs through human humming/singing. Two subtasks are proposed for the evaluation [5]. The first subtask is a classic QBSH evaluation, which is exactly the same as last year’ subtask1. The second task, however, encourages the participants to submit separate algorithm modules instead of integrated one so that various combinations of transcription and matching could be evaluated.

As evaluation data, the first subtask adopts Jang’s collection which consists of 2797 queries from 48 ground truth MIDIs [6]. The second task adopts Think IT collection with 355 sung queries from 107 MIDIs [7]. Both tasks employ 2000 Essen MIDIs as noise data. If an acoustic query is classified as singing, we can apply lyrics recognition for better performance. Since the average length of a singing query is about 7 seconds, the first 30 syllables of each song are used to build up the recognition network. By considering the recognition network as a finite state machine, this network is determinate and minimized by AT&T FSM tool [8]. B. Pardo, J. Shifrin and W. Birmingham proposed powerful feature of MPEG-7 makes it possible for a person to search music in a library by simply singing out loud a part of the song [9] Fraunhofer Institute, “Query by humming”, “Name that tune: a pilot study in finding a melody from a sung query”.

Music annotation can be used for a variety of purposes, such as searching for songs exhibiting specific qualities, or retrieval of semantically similar songs. Since semantics is a compact, popular medium to describe an auditory experience, it is essential that a music search and discovery system supports these semantics-based retrieval mechanisms, to recommend content from a large audio database.

Over the past years, using text-based search engines has become the “natural” way to find and access all types of

multimedia content. While there exist approaches to automatically derive and assign semantic, natural language descriptors for text, videos, and images broad field of popular music has not drawn that much of attention. Basically all existing music search system, e.g. those offered by commercial music resellers, make use of automatically assigned subjective meta-information like genre or style (in addition to objective meta-data like artist, genre, instrument, or year) to index the underlying music collection.

Thus, the person issuing the query must already have a very precise conception of the expected result set. The intrinsic problem of the systems is the limitation to a rather small set of meta-data, whereas the musical, or more general, the cultural context of music pieces is not captured.

Take advantage of these descriptions to build capable music access systems that help the users finding music in large collections using the screen shown in Fig: 2. Improve the quality of music retrieval tasks, by means of combining content information, context information, and subjective information (tags) in order to get a better approximation of the similarities between songs. Feature of Tag Based Semantic Annotation Generation is based on an audio tagging can bring much more than really categorize songs and albums by genre, instruments and artists (Shown in Fig: 1).

The current research focuses on two aspects of the musical databases.

1. Semantic Annotation Generation using the tag based approach.
2. An Audio Search Engine

Which the user can retrieve the songs based on the users' choice. The proposed method can be used to annotation and retrieve songs based on musical instruments used , mood of the song, theme of the song, singer, music director, artist, film director, instrument, genre or style and so on.

3. Tag Based Semantic Annotation Generation

Tag Based Semantic Annotation Generation is an interface when the annotator can annotate the song based on the key concepts. Tag Based Semantic Annotation Generation is an interface to the user, which list out various semantic concepts that can be used for tag based annotation generator for songs. And it contains music details such as Language, Mood of the Song, Theme of the Song, Name of the Singer, Music Director, Instrument, Actor / Actress, Music Company, Film Director, Instrument, Genre and so on.

Tag Based Semantic Annotation Generation can be used as input to collaborative filtering system that helps users annotate for music (Screen shown in Fig: 1). Music annotation generator is general way to store and bring the music files using metadata such as the name of the musician or actor / actress, the name of the song or the album.

D. Turnbull, L. Barrington, and G. Lanckriet are proposed Consists of song review, instrument tag and genre, ratings according to bipolar adjectives (e.g., sad/happy). The tags can be used as input to collaborative filtering system that help users search for music. Perhaps the fastest and most cost-effective way to collect semantic information about music is to mine web documents that relate to songs, albums, or artists.

Tags based approach used in Tag Based Semantic Annotation Generation and it is used to annotate songs using the proposed tool semantic tag based annotation generation. The tool collects different semantic categories, such as emotional content, genre, instrumentation, and name of the singer.

Which the user can retrieve the songs based on the users' choice. The proposed method can be used to annotation and retrieve songs based on musical instruments used , mood of the song, theme of the song, singer, music director, artist, film director, instrument, genre or style and so on.

Music annotation can be used for a variety or purpose, Such as searching for songs exhibiting specific qualities, or retrieval of semantically annotate song. Since semantic is a compact, popular medium to describe an auditory experience it is essential that a music search and discovery system support these semantics based retrieval mechanism to recommended content from a large audio database.

Meta data in the world of audio has usually been controlled to telling common information about the audio data, like the author, copyrights, etc. More in strength feature-related metadata is still not widespread. Several methods to retrieve music from large database have been proposed. The goal of this paper will be to define an XML-based format in order to store metadata.

Fig: 1 Tag Based Semantic Annotation Generation

4. Audio Search Engine

We propose a new approach to an audio search engine that can be accessed via natural language queries. (Screen shown in Fig: 2) When a user likes to find a song of character based on the features like are singer name, artist, music director, and etc. The main advantage of an Audio Search Engine is appeared audios only like .mp3, .mp4, .midi, .wmv, .avi, .mpeg, .amr, and so on using the screen shown in Fig: 3.

The current work also support music file selection based on the Language, Mood, Theme of the Song, Singer, Music Director, Actor / Actress, Instrument, Genre and so on. The idea of emotions based music retrieval is proposed. For example, when some person is sad for several reason, she or he want to listen to a part of music that can cheer her or him up, at this moment she or he will search music by mood no matter what the melody sounds or whom the artist is.

We presented a first attempt to create an audio search engine for large music collections that can be queried via natural language text input. One of the central challenges of audio search engine method is to assign semantically related information to individual song. The performance of an audio search engine approach is evaluated. For testing we compiled a large music collection of mp3 files from the personal collection of the database.

1. Text-based access searching the text of songs for particular phrases

2. Searching for a particular melody or tune

3. Looking for a particular type of music, i.e. for titles within a specific musical genre.

All of these approaches address situations where a user knows, more or less, exactly what he or she is looking for. None of the existing approaches naturally supports browsing of a collection, searching for a certain type of music, rather than for a specific title. But the proposed in support still, an audio search engine to exploring music archives is one of the most prominent in conventional record stores, where customers explore the total wealth of information in textual form by getting the song based on the user choice.

Fig: 2 Audio Search Engine

Fig: 3 Retrieval Song

5. Conclusion

Tag based audio search engine contains two phases, First one is Tag Based Semantic Annotation Generation and it is an interface to the user and it includes music features such as Mood of the Song, Theme of the Song, Singer, Instrument, Artists, Music Company, Language,

Film Director, Instrument, Genre, Music Director and so on. All major semantic concepts are indentified and listed by the annotation tool. The annotator generates the semantic tags. The tool uses the semantic tags to generate annotation for film songs. The semantic tag based annotation in further used for indexing and retrieval of relevant songs.

Second one is Audio Search Engine, user can search a song in natural language by using the features like are Singer name, genre, instrument, artist, etc. The main advantage of this Audio Search Engine, it supports musical files like .wmv, .avi, .mpeg, .amr, .mp3, .mp4, .midi, and so on. Tag based Audio Search Engine is user friendly and user can easily retrieve the musical files from the database depends on the user mood. Feature of Tag Based Semantic Annotation Generation is based on an audio tagging can bring much more than really categorize songs and albums by genre, instruments and artists.

References

[1]. M. Nilsson and J. Sundström, “The short history of tagging”, http://www.id3.org/history.html.

[2].Fraunhofer Institute, “Query by humming”, www.idmt.fraunhofer.de/eng/press_media/download/product_information/qbh_eng_web.pdf, 2004.

[3] .N. C. Maddage, H. Li, and M. S. Kankanhalli. Music structure based vector space retrieval. In Proceedings of 29th Annual International ACM SIGIR Conference, Seattle, USA, 2006.

[4] .D. Eck, P. Lamere, T. Bertin-Mahieux, and S. Green. Automatic generation of social tags for Music recommendation. In NIPS, 2007.

[5].Http://www.music-ir.org/mirex2007/index.php/Queryby Singing/Humming.

[6]..Http://neural.cs.nthu.edu.tw/jang2/dataSet/childSong4public/QBSH-corpus/

[7]. Http://hccl.ioa.ac.cn/en/Thinkit.QBH.corpus.rar

[8]. AT&T Labs Research, AT&T Labs Research – FSM Library, http://www2.research.att.com/~fsmtools/fsm/, 2008

[9] .Fraunhofer Institute, “Query by humming”, www.idmt.fraunhofer.de/eng/press_media/download/product_information/qbh_eng_web.pdf, 2004.

[10]. B. Pardo, J. Shifrin and W. Birmingham, “Name that tune: a pilot study in finding a Melody from a sung query”, Journal of the American society for information science and technology, vol.55, 4, pp. 283-300, 2004.

[11]. McEnnis, D., McKay, C. and Fujinaga, I. “Overview of OMEN”, Proc. of ISMIR, pp. 7-12 2006.

[12]. D. Turnbull, L. Barrington, and G. Lanckriet, “Modelling music and words using a multi-class naïve bayes approach,” in Proc. ISMIR, 2006, pp. 254–259.