Content based classification and retrieval of audio from database

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Introduction

Content-based technology has emerged from the development of multimedia signal processing and widespread of web applications. In recent years, audio, as an important media, has been gained more and more attention.

An audio is classified as speech, music, several types of environmental sounds, silence and many more. The audio database has details of feature extracted from various categories of audio. The proposed project allows a user to retrieve audio, based on the features of input audio request. An audio having same or similar features will be displayed to the user.

Problem statement

To design a methodology to classify and retrieve audio based on its content from the audio database.

Motivation

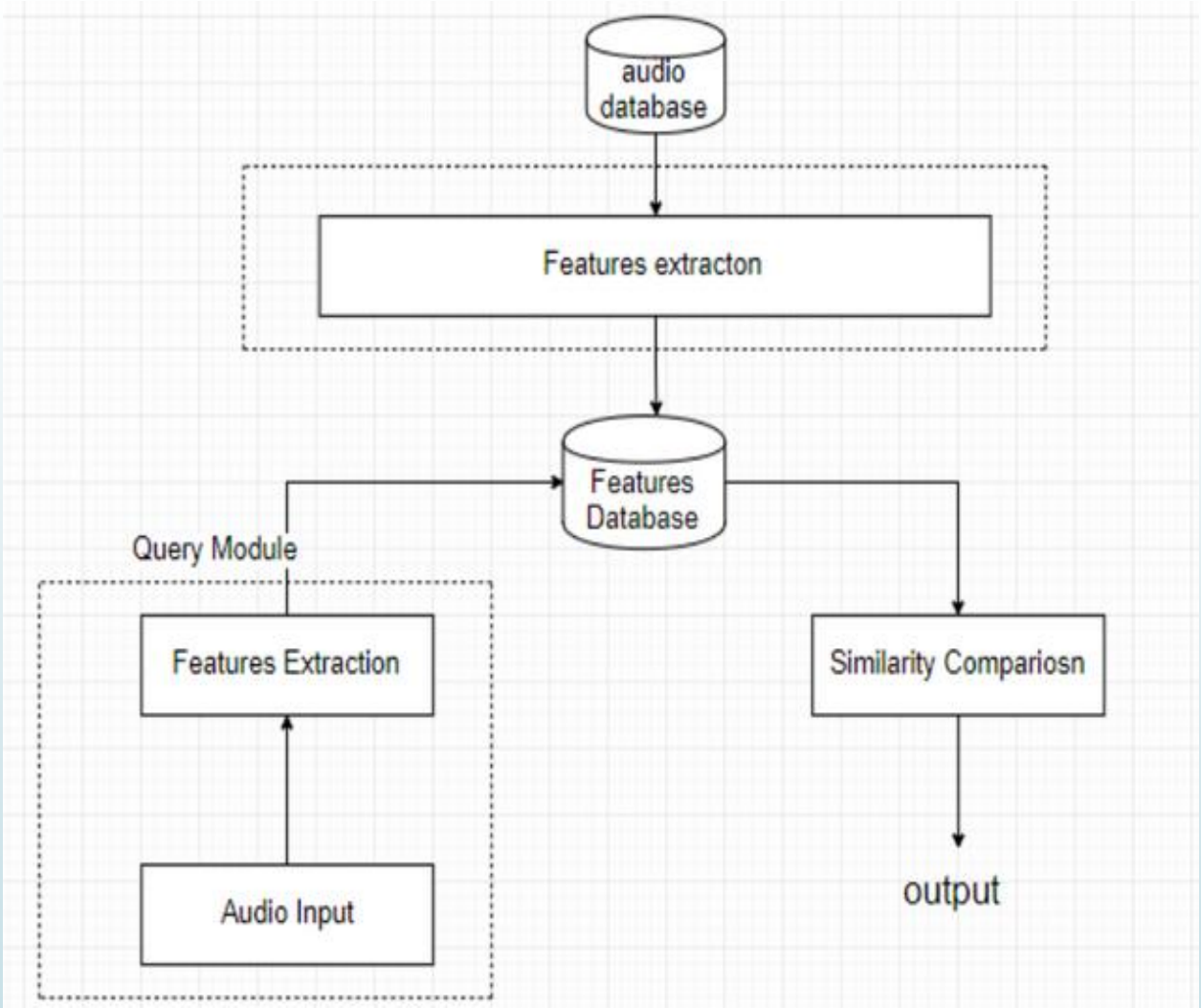
The digital libraries of the future will include not only (ASCII) text information but scanned paper documents as well as audios and videos. There is, therefore, a need to retrieve information from such multi-media collections. This includes retrieval of audio data from its database.

Objectives

The main objective of content-based audio retrieval is the identification of similar audio data.

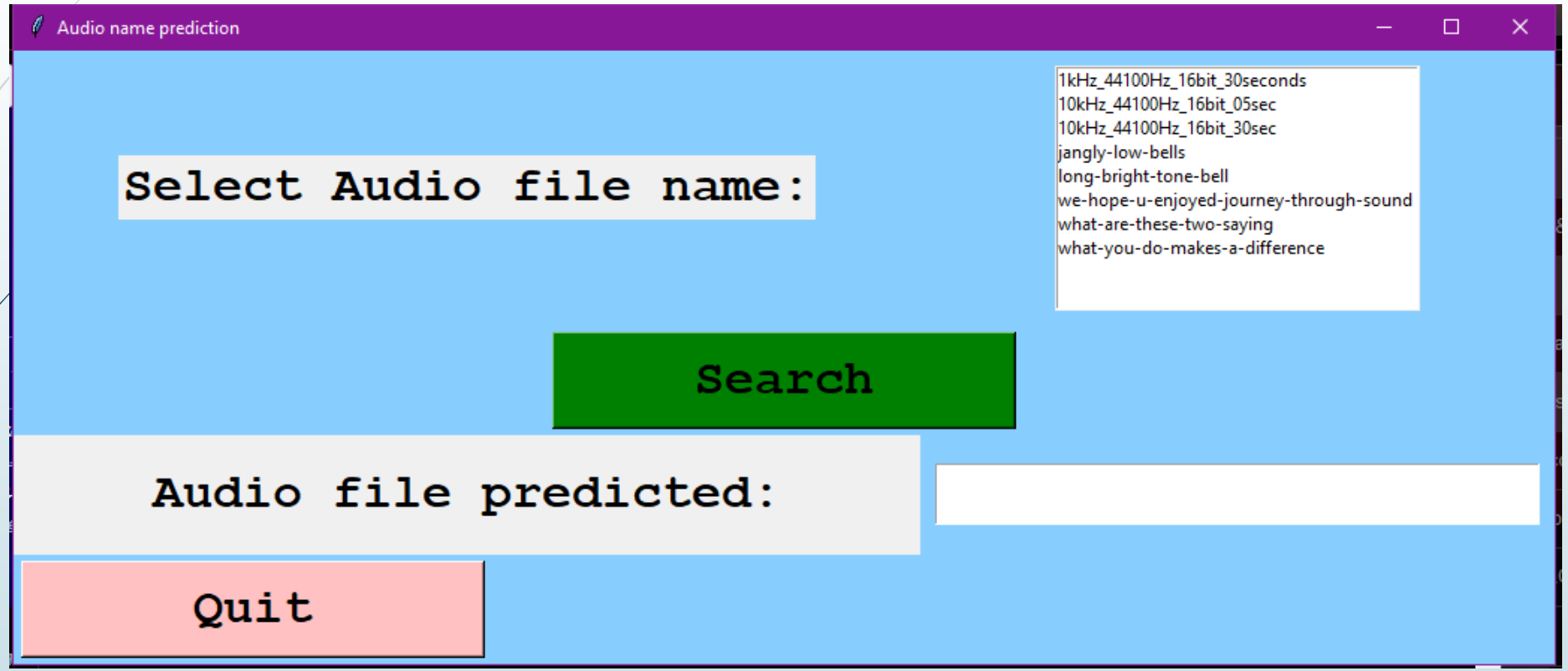
1. To design a methodology to retrieve audio based on the content of the requested audio:
   - The entered audio should be of a .wav type.
   - The entered audio should be of length 3 seconds to 10 seconds.
   - The entered audio should have at least one similar audio file in the audio database.
2. There should be an audio file displayed:
   - The output should have the most similar audio file from the audio database.
   - There should be at least one similar audio file present in the database.
3. The listed audio file must match the input audio file as accurately as possible:
   - The accuracy of matching of input audio file and the output audio file should be good enough.

Architecture diagram

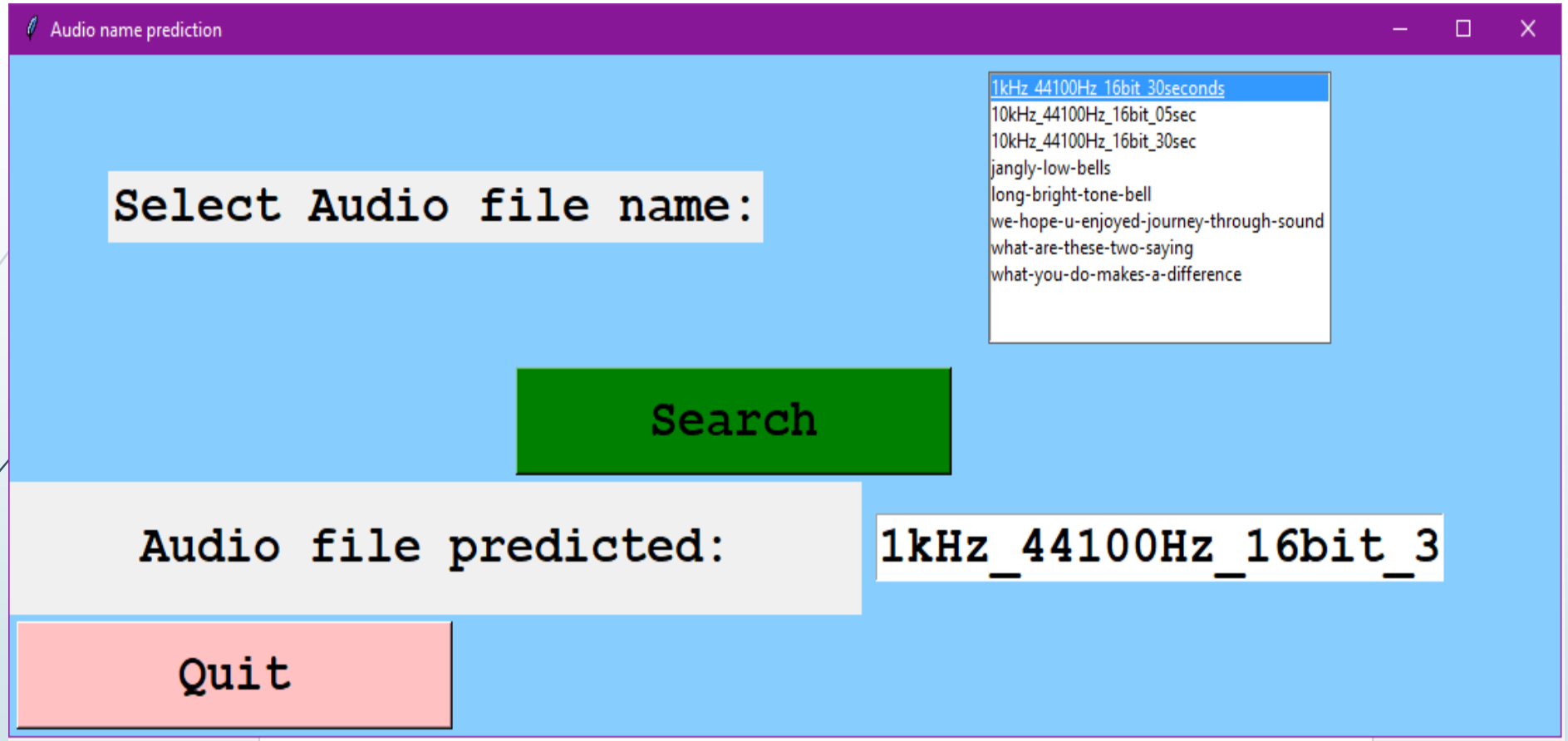


Architecture diagram of the proposed system

Results



Fetching of the audio file



Most similar audio from database as output

Conclusion

In this software, when an audio file is given as input, an audio file from the trained dataset is retrieved. The exact or most similar audio file will be retrieved. Our approach focuses on analyzing six different features. These distinct features involve energy and RMSE, zero crossing rate, magnitude scaling (amplitude), pitch transcription (onsets), tempo (global) and beat tracking of .wav audio files and realize the query-by-example music retrieval in a database. As the audio files are limited to a length of 3-10 seconds and of type .wav, we can extend this project to longer audio length and to mp3 format.

Thank you.