BvdM3 Project Brief

Matt Jenje – 18516009

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1 Description

The aim of this project is to create an application which can correctly identify a piece of music by listening to it (similar to Shazam and Sound Hound). The application will need to take an input from a microphone, cancel out noise which is not part of the song, convert the input signal into Parsons code and search through the Open Music Encyclopedia and/or Melody Hound for the song matching the Parsons code. Approximate string matches will also need to be returned to return the correct song in case the Parsons code does not match up exactly.

The result will be returned to the user as a song name, contributing artists and the album which the song was first released on. Investigation into whether searching for the correct song can be done in parallel will also be conducted. This would reduce the fetch time for song information and greatly improve the response of the application.

Additional features such as searching by rhythm may be implemented as well. The application could also potentially be converted into a mobile app. The additional features would depend on how the main requirements of the project progress throughout the course of the year.

2 Goals

- Create an application which can recognize and accurately show information about a song from a sound recording
- Investigate and potentially implement the use of concurrent programming in searching algorithms
- Determine and implement the best strategy for searching through a large database
- Determine how to connect the Musipedia search engine to an application
- Determine how to filter out noise in a recording to get a clean piece of data/ sound for searching

3 Constraints

1. Time: the application should not take more than 10 seconds to identify a song from a recording for the user experience
2. Equipment: The device running the application will need a microphone and connection to the internet for the application to work
3. Deadline: the application needs to be done by October 2017
4. Programming Language: Any language which can implement the SOAP web service

4 Expected Difficulties

I expect that removing the background noise will be challenging in order to get a clean parsons code. I also expect to encounter trouble with implementing the web service as this is something I have never done before and getting it right may be challenging. Determining the most efficient way to search and sort through the database of sounds will also be a challenge, I will need to do research on approximate string matching problems to properly approach this problem.

5 Initial Schedule

13/02/17- Project brief due
22/03/17- Requirements document due
02/05/17- Design document due
04/05/17- Do-or-die demo
12/05/17- End of semester one
To be expanded upon...

6 Reading List

References

[1] Robert Englander *Java and SOAP*. O'Reilly & Associates Inc., Reading, Sebastopol, 2002.

[2] Bruce Fries, Marty Fries *Digital Audio Essentials* O'Reilly & Associates Inc., Reading, Sebastopol, 259–268, 2005.

[3] Ngoc Thanh Nguyen, Aleksander Zgrzywa, Andrzej Czyzewski (Eds) *Advances in Multimedia and Network Information System Technologies* Springer-verlang, Berlin, Heidelberg, 235–300, 2010.

[4] Arnab Bhattacharya *Fundamentals of Database Indexing and Searching* CRC Press, New York, 2015.

[5] Source Separation,
`http://en.wikipdia.org/wiki/Source_separation`