MA: Your Personalized Radio

This document describes the subject and the general time schedule of the master thesis of Rahul Jain, beginning in the autumn term 2011. Adaptations or changes can be agreed upon by the advisers.

Subject

Several factors, such as the growth of the Internet, peer-to-peer technologies, or the emergence of the compact media formats have changed the way people deal with music. Personal music collections have grown bigger, and, thanks to portable players and advances in storage technology, they can nowadays be accessed anywhere and anytime. The music collections accumulated by music lovers have reached sizes that make it hard to maintain an overview of the data by just browsing hierarchies of folders. Therefore, novel methods to organize music are required – methods that efficiently operate on orders of thousands of songs, and that allow personal music collections to be seen not just as isolated entities, but positioned in the global context of the world of music.

In our lab, we have developed *jukefox* (http://www.jukefox.org), a Music Player for the Android Mobile Platform that addresses these issues. An important ingredient of the application is a "map of music" that reflects music similarity and allows new ways of accessing and browsing a user's music collection. In particular, we have placed more than 1M artists and songs into a Euclidean space, such that similar items reside at similar location in this space. The underlying music similarity measure is based on usage data of the web radio service last.fm: "Preferred song lists" of over 1 million users and over 30 million social tags were utilized in conjunction with Probabilistic Latent Semantic Analysis to construct a music similarity space that solely relies on implicit and explicit human judgment of music perception.

By now, jukefox only works on the local music collection of a user. The Goal of this thesis is to seamlessly extend a user's collection with new music from online radio streams, by offering a play mode that automatically selects a radio stream after each song based on the music taste of a user and his skipping behavior. To achieve this goal, Raul will have to define a notion of music taste that describes the style of music and possibly the listening habits of a user in a compact fashion and is based on the music similarity measure. Moreover, he will have to implement a server software that is able to give a list of radio streams that currently play a song which matches a requested music taste profile. On the client side he will develop a play mode that plays songs from online radio stations, without that the user has to care from which station this music comes from.
A final evaluation concerning the usefulness and the user acceptance of the system will be done through a user study on the Android market or by recruiting participants from ETH.

Time schedule (Total: 25 weeks)

- Study related work [**]
- Get familiar with shoutcast streams and maybe adapt stream-listening server [*]
- Define a compact representation of music taste and listening behavior [**]
- Implement the stream request server [***]
- Implement a the streaming play mode in jukefox [**]
- Evaluate the results [*]
- Write the report [**]

The Students' Duties

- One meeting per week with the advisers.
- Regular check-ins of the progress using the Subversion or Git system
- One intermediate presentation (15 min).
- One final presentation (15 min).
- A final report (15 to 40 pages, English or German), presenting work and results.
- Two copies of the report (each containing a CD with relevant code, etc.) should be handed in in the end.

General

- Independent working is expected
- A possibility to work in the ETZ is provided. It is also possible to work at home

Contacts/Advisers

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