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Lab/SA/MA: *MusicExplorer*: Exploring the Space of Songs on your PC

The way people interact with the world of music has changed dramatically over the last few years. The distribution of songs and albums tends to be done mainly over the internet, which results in formation of large collections of music on personal computers. These collections are so large that it becomes hard to have an overview of this data by just browsing hierarchies of folders. To help organizing music, songs can be encoded in a graph representation, where songs are nodes and edges denote similarity between songs. Path length calculation provides a simple approximation for distances within such a graph. However, it suffers from different drawbacks, such as, for example, the memory and computational complexity of calculating a shortest path on a graph, which might contain millions of nodes. Such problems can be overcome by embedding the shortest path metric into a Euclidean space. Distances can easily be calculated from the resulting coordinates without loading the whole graph into memory and without the necessity of a central server, also making distributed applications possible.

Based on such an embedding, we developed a web application, called *MusicExplorer*[1], which allows you to create an *xml* file with all the meta information and Euclidean coordinates of your own music collection. Given such an encoding, you can enter one or more song names and obtain a playlist, spanning the space between these songs. The resulting playlist follows a smooth style transition from the start to the end points (songs), and is output in *m3u* format, ready to be played on your machine. You can create playlists for parties, allowing your friends to enter songs that they like, or you can create music sequences that will reflect your own mood. If you are not convinced whether it is really worth creating the encoding of your whole music collection, you can check out the tool using our music graph, which contains more than 400.000 song titles (of course, in this case you are not going to be able to listen to the generated playlist right away).

In this thesis we want to especially focus on applications that explore this type of encoding of music collections. We already have several interesting applications in mind, so your task will be to realize some of out best ideas, or, even better, come up with new ideas for innovative applications and user interfaces that will change the way people deal with music collections on their PCs. Your work will consist in inventing, developing and testing robust and efficient programs, intended to be used by as many people as possible!

Kind of work: mostly practical.

Interested? Please contact us for further details!

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[1] http://www.musicexplorer.org/