KV Multimedia Search and Retrieval

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ABSTRACT

In this paper a rudimentary song-based retrieval system is being developed. Multiple different algorithms for computing the similarity between two songs are tested and compared with a random baseline. For calculating this similarity measure only text-features are used. This paper compares the cos-sim-similarity based on the tf-idf and word2vec respectively. This is contrasted with a measure using the transformer-based BERT.

1 Introduction

The increasing availability of digital libraries has paved the way for a new generation of music recommender systems. Music recommendation systems play a pivotal role in helping users discover new tracks, artists, and genres and thus drive customer satisfaction in a significant way.

The purpose of this paper is to evaluate and compare 4 different approaches to music retrieval systems. Within the scope of this paper all features are going to be text-based.

Concretely, the effectiveness of cos-sim-similarity based on both tf-idf and word2vec are compared to BERT.

The resulting recommendations will be evaluated qualitatively according to the similarity to the queried song.

The data set used for testing the 4 retrieval systems is a subset of the Music4All-Onion dataset which was kindly provided by the university.

2 Methodology

For implementing the assignment, the programming language Python is used as it has the most support for data analysis and data science purposes. The coding environment used is the notebook-based Google Colab. Mayor advantages of using Google Colab is that data intensive calculations can be done easily on every hardware using cloud technology. The code repository is hosted on the platform Github. The coordination and integration of code contributions of each team member is therefore ensured through the use of Git.

To ensure that new functionality as well as new algorithms can easily be added the text-based music recommender system in the future a large focus is set on making the code modular.

The input of the query is the name of the song as well as the name of the corresponding author. The recommender system the should output a List of songs with the title and the artist-

To be better able to analyze the results of the recommender system this output of the script is saved in a dictionary.

2.1 The dataset

Music4All-Onion is a large-scale, multi-modal music data set, which expands the Music4All-dataset with additional features and meta-data. For the purpose of this task only the text-based features like “Title” or “lyrics” are considered.

[info about the the feature vectors]

[info about the two tsv files]

2.1 Random baseline

2.2 Cos-sim based on tf-idf

2.3 Cos-sim based on word2vec

2.3 Combination

3 Qualitative Analysis

4 Results and Findings

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