THE INTEGRATION OF A METADATA GENERATION FRAMEWORK IN A MUSIC ANNOTATION WORKFLOW

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1. ABSTRACT OUTLINE

In the MuziK project we try to automate the typically hard task of annotating music files manually. This annotation is used for music recommendation and for automated playlist creation. The music experts of Aristo Music (http://www.aristomusic.com) defined the data fields. High quality annotations are required since the results, playlists, are used in commercial live settings and the cost of a wrong selection is high [1].

1.1 History

Until now, music experts annotated manually. Custom tools have been developed for that task. A SWOT analysis showed that the annotation of some of the parameters could and should be automated [2]. Mainly parameters like year, beats per minute, regional popularity that require a lot of time from the experts are good candidates for automation. As the technology of today is not yet capable of grasping every fine nuance in the interpretation of the meaning of different musical parameters, the generated metadata is now integrated in the workflow of the music experts. Automated metadata generation can do a preselection, effectively limiting the number of values to choose from.

1.2 Methodology

We rely on an open source software framework for distributed automated metadata generation, SamgI (http://ariadne.cs.kuleuven.be/samgi-service). It integrates multiple third party libraries. Partial results are aggregated and represented in a single, unified representation and offered through different interfaces; i.e. SOAP and REST. In the MuziK project, signal processing, web-based techniques and data analysis are combined. Two different installations of the framework complement each other. One is specialized in signal processing tasks, while the other takes care of web-based analysis. In the signal processing part of the framework, we implement several modules or "generators" to generate metadata that is based on the acoustical properties of the musical audio data. In its simplest form, such a generator only uses the raw musical audio data and deploys signal processing and artificial intelligence techniques to calculate the desired features. In a more advanced form, a generator uses additional metadata provided by other sources or generators. For example, with extra knowledge about the year of release or the band and their usual genre or instrumentation, the estimation of other features can be better optimized. Currently we have integrated generators for BPM, musical hardness, musical genre, rhythm and dancing style, combining tools as BeatRoot [3] and Marsyas (http://marsyas.sness.net/) and Weka (http://www.cs.waikato.ac.nz/~ml/weka/).

The other installation, focused on web-based retrieval and data analysis, polls online services such as Last.FM (http://last.fm) and DiscoGS (http://www.discogs.com) for record and artist information, such as the year of a release, biography and the origin of an artist [4]. An extra generator looks at Aristo Music's current metadata database and extrapolates pieces of information. E.g. vocals for Sting are in 90% of the cases single male, so it is safe to assume this for newer releases.

The framework offers ways to group generators in logical units of generators that rely on one another or have related output. These units can be made available to the outside world as different so-called entry points to the framework. A single installation of the framework can for example host an entry point for signal processing for audio files and a keyword generation suite for text files. The entry points are automatically available with the SOAP and REST interface.

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