Contributions

- Review of standard Audio Features for Music Information Retrieval
- Study of the importance of Psycho-acoustics in Audio Feature Computation
- Improvement of Rhythm Patterns Feature Extractor
- Development of 2 new Feature Sets: RH and SSD
- Evaluation, Comparison and Combination of Feature Sets
- Participation in international scientific Benchmarking events for Comparison with State-of-the-Art Feature Sets
- Contributions to novel applications for visualization of and interaction with music collections
- Clustering of the complete works of Mozart on a Self-Organizing Music Map

Audio Feature Extraction for Music Description

Rhythm Pattern (RP)
magnitudes of 60 modulation frequencies on 24 critical frequency bands

Rhythm Histogram (RH)
rhythmic energy for 60 modulation frequency bins

Statistical Spectrum Descriptor (SSD)
7 statistical moments describing fluctuations on Bark-scale Sonogram

Evaluation and Benchmarking: Music Classification and Similarity Retrieval

ISMIR 2004 Audio Description Contest
Genre Classification | Artist Identification | Rhythm Classification

MIREX 2005
Genre Classification

MIREX 2006
Audio Music Similarity and Retrieval

Human Evaluation ( Friedman Test)
Evaluation based on meta-data statistics
Comparison of Computation times

Applications of the developed Audio Features for Music Retrieval

PlaySOM
Exploration of and interaction with music collections allows to switch visualizations and to create playlists

Map of Mozart
Analyzed and clustered Mozart’s Complete Works by audio music similarity on a Mnemonic SOM interactively explorable on www.ifz.tuwien.ac.at/mir/Mozart 2442 pieces from 17 categories (categories subsequently overlaid)

PocketSOMPlayer
Export of Music Maps allows to explore and stream music collections on mobile devices (PDA, mobile phone)

Visualization Methods

Hit Histogram | Query Hit Histogram (interp.) | U-Matrix | Smoothed Data Histogram | Gradient Field | Class Visualization | Weather Charts: Bass