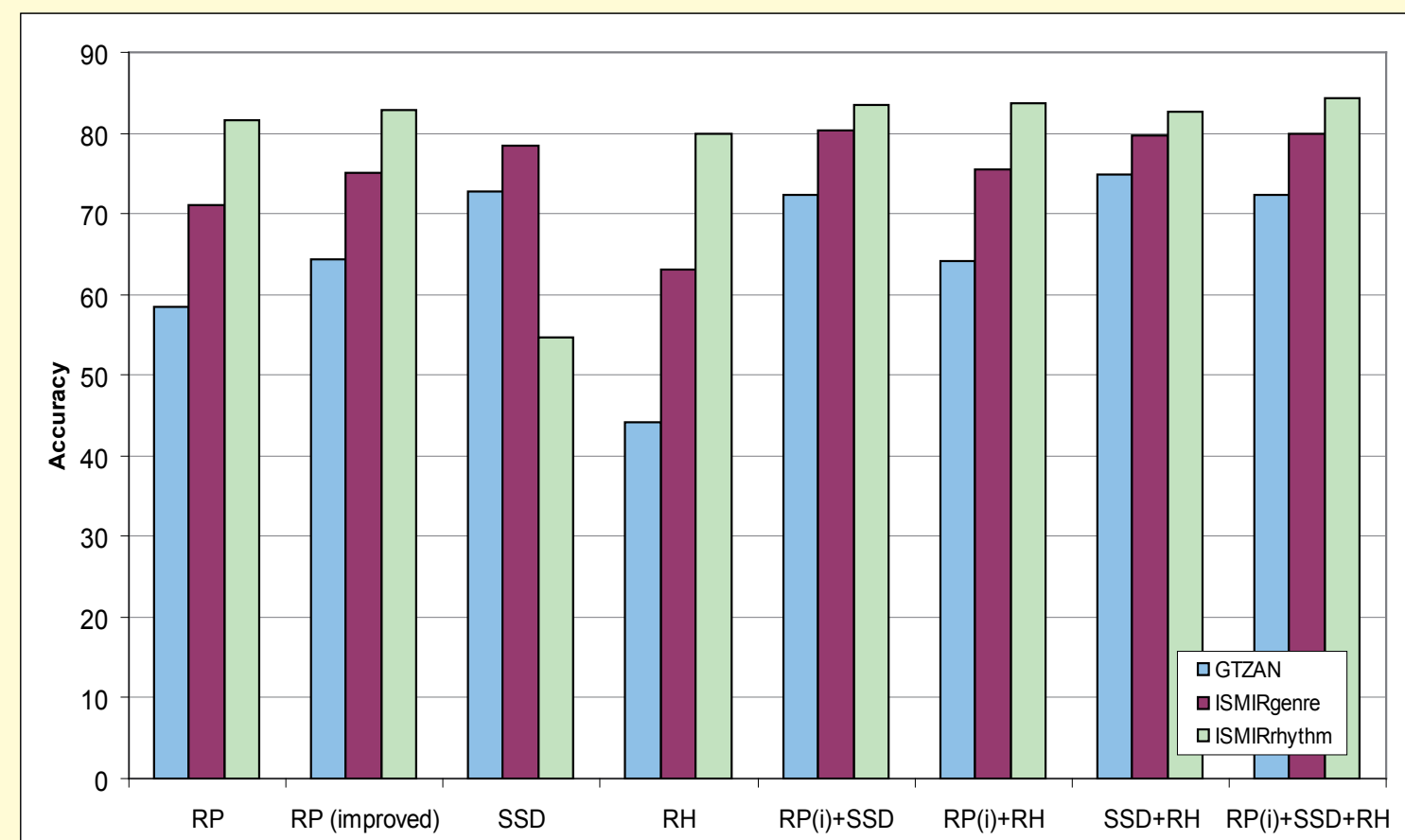


Evaluation of New Audio Features and Their Utilization in Novel Music Retrieval Applications

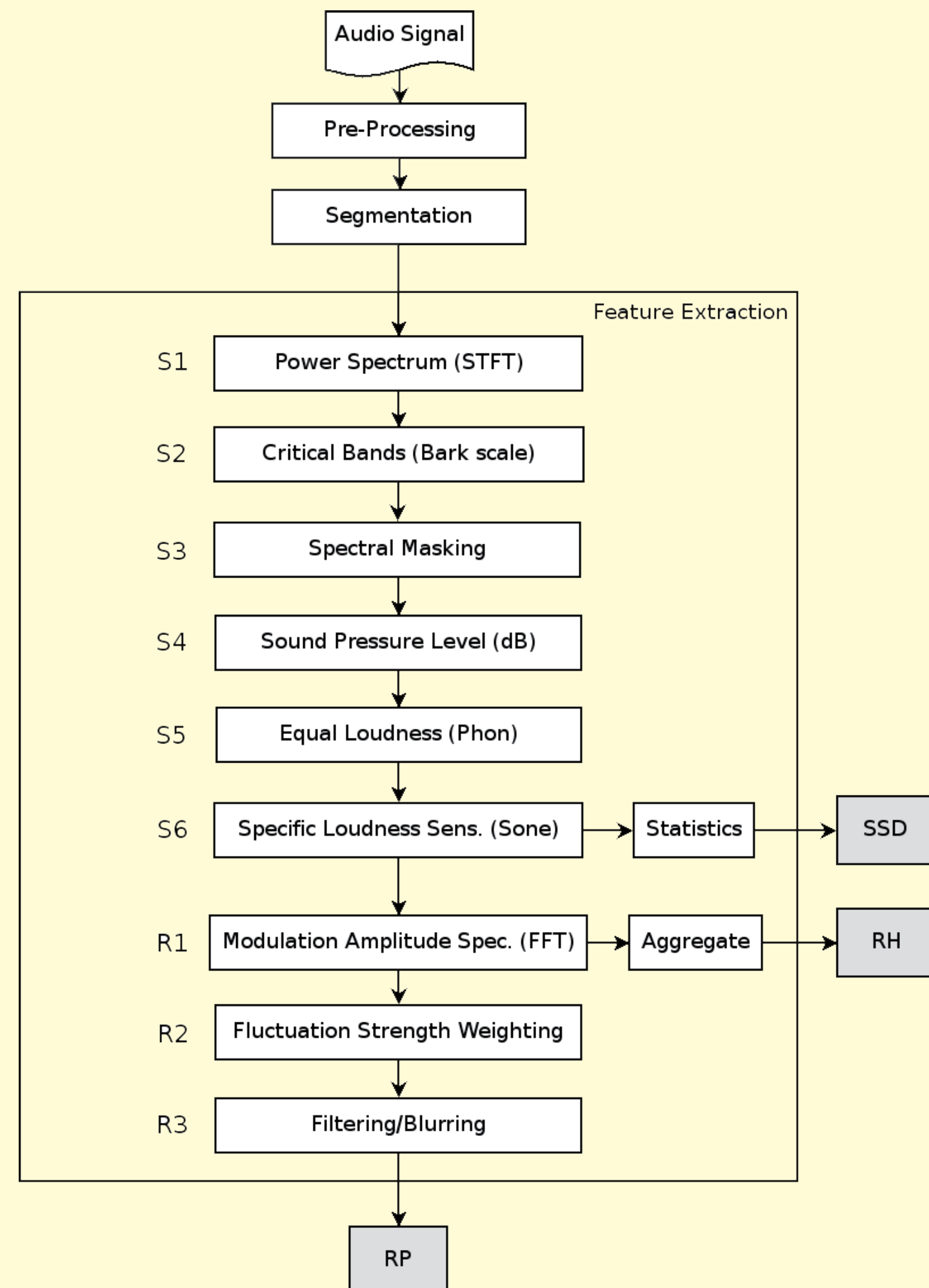
Contributions

- 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



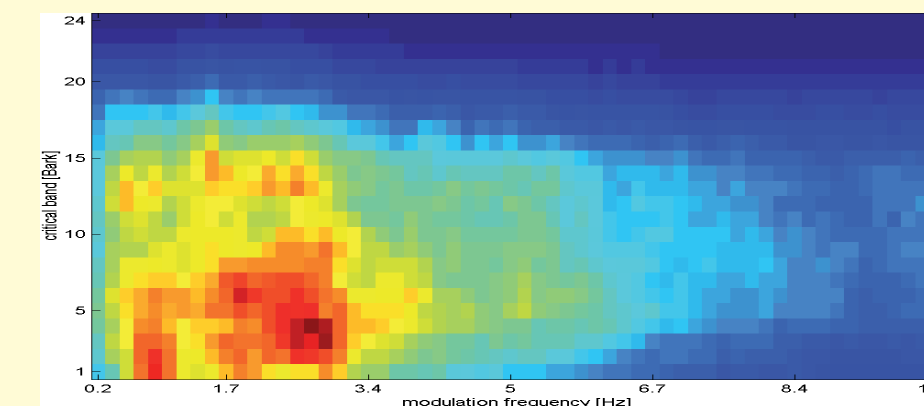
Comparison of developed Feature Sets and combinations

Audio Feature Extraction for Music Description

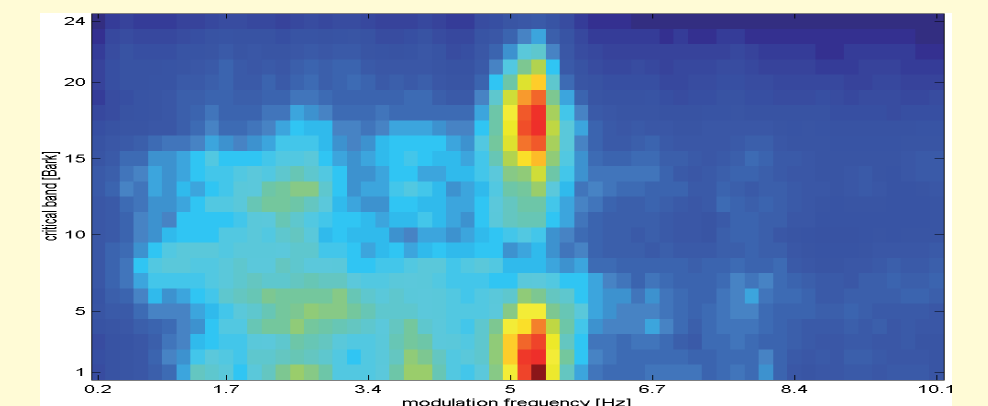


Rhythm Pattern (RP)

magnitudes of 60 modulation frequencies on 24 critical frequency bands



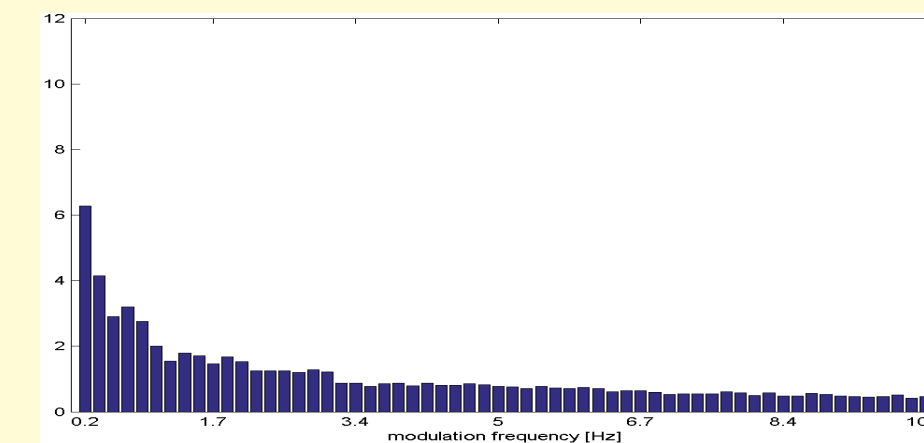
Johann Strauss - Blue Danube Waltz



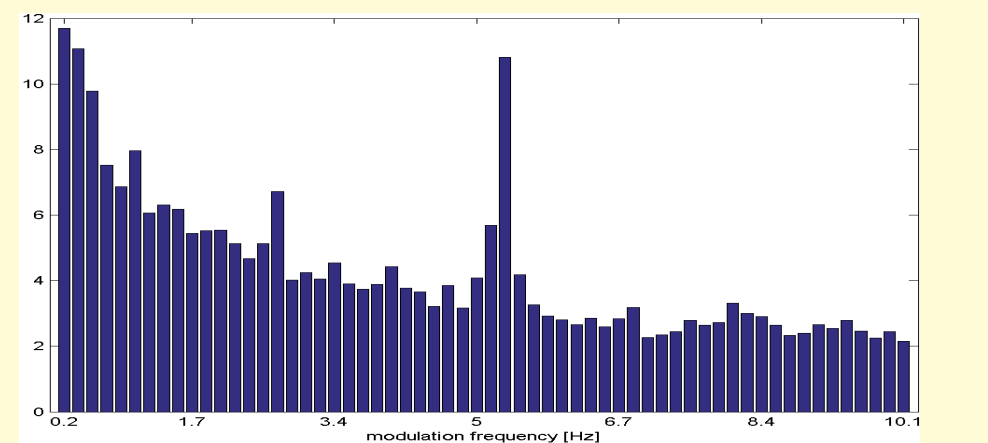
Queens of the Stone Age - Go With The Flow

Rhythm Histogram (RH)

rhythmic energy for 60 modulation frequency bins



Johann Strauss - Blue Danube Waltz



Queens of the Stone Age - Go With The Flow

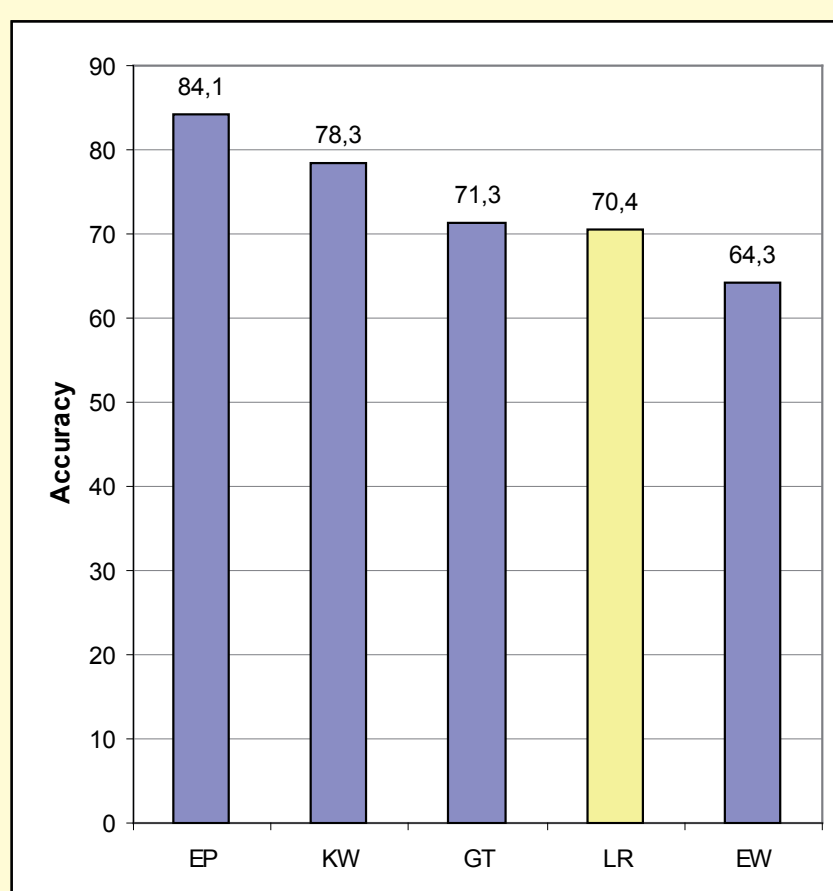
Statistical Spectrum Descriptor (SSD)

7 statistical moments describing fluctuations on Bark-scale Sonogram

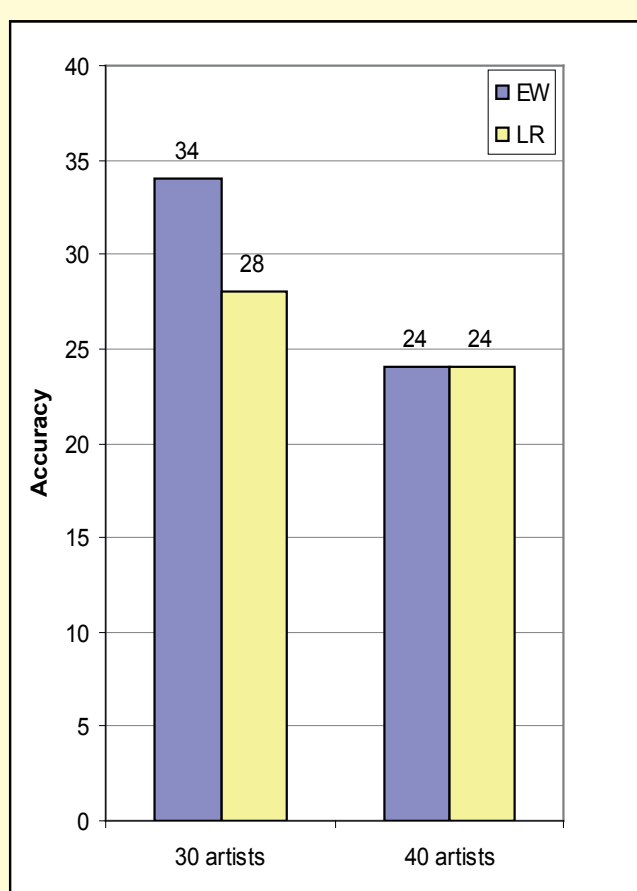
Evaluation and Benchmarking: Music Classification and Similarity Retrieval

ISMIR 2004 Audio Description Contest

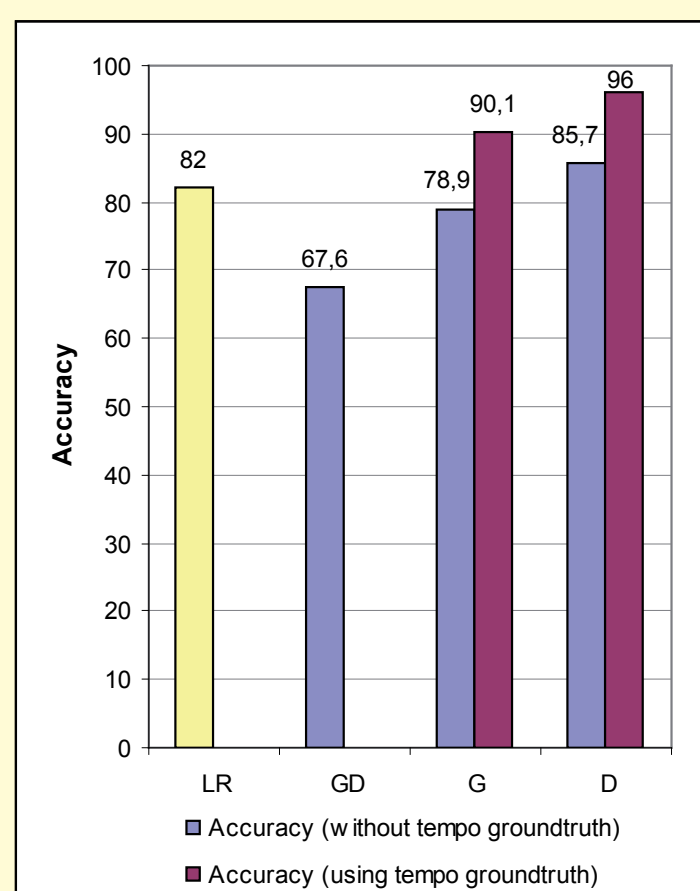
Genre Classification



Artist Identification

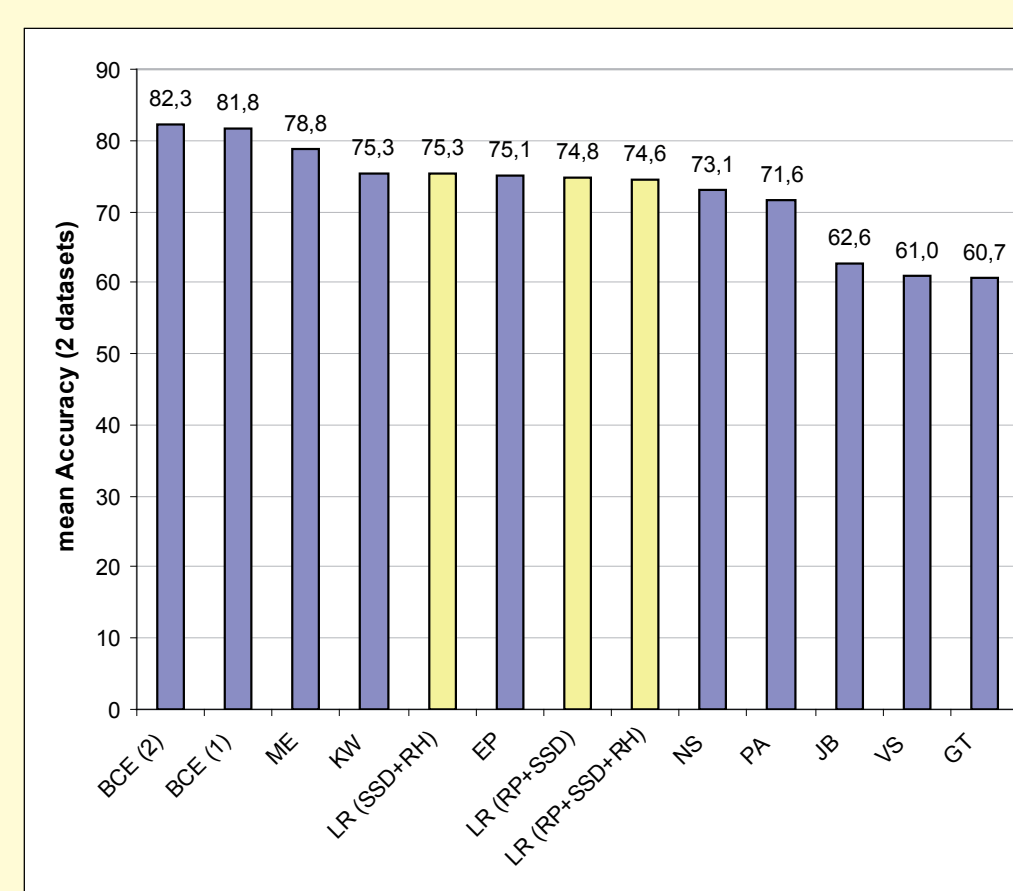


Rhythm Classification



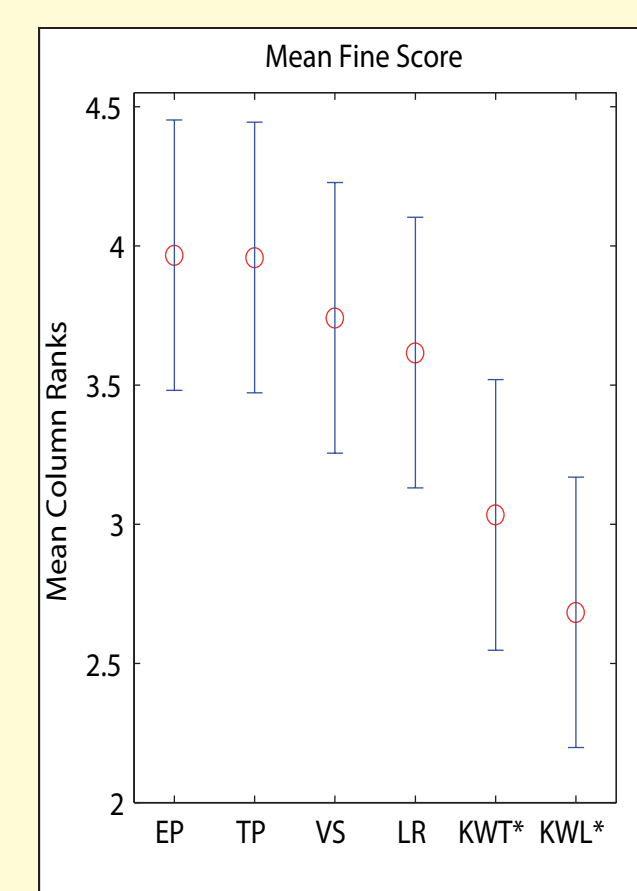
MIREX 2005

Genre Classification

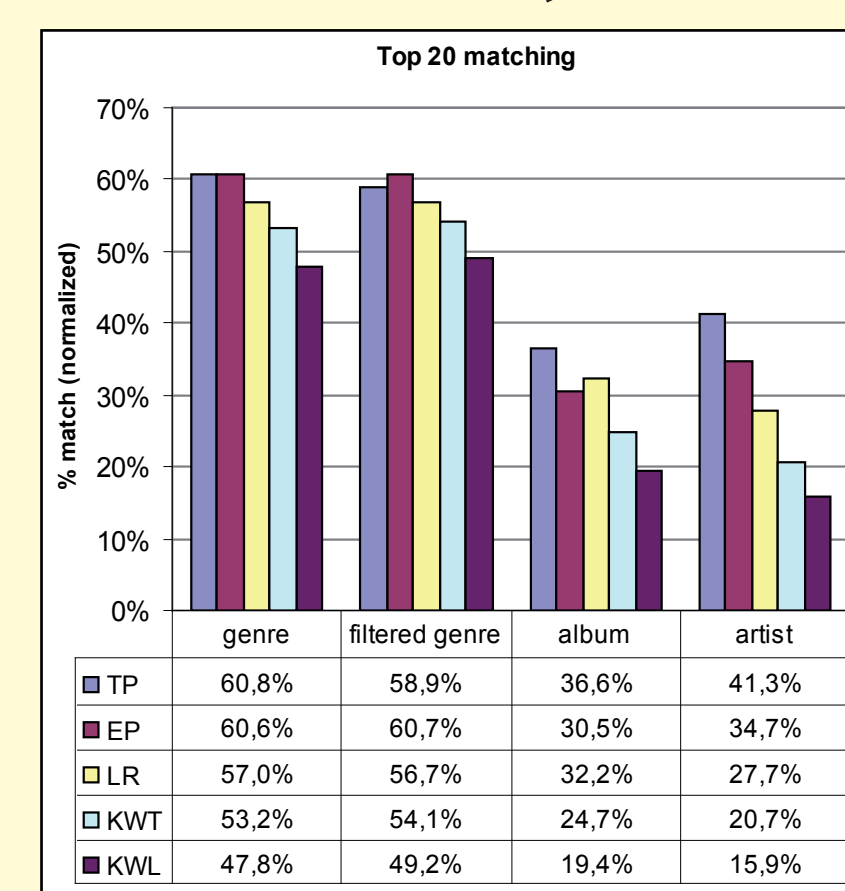


MIREX 2006

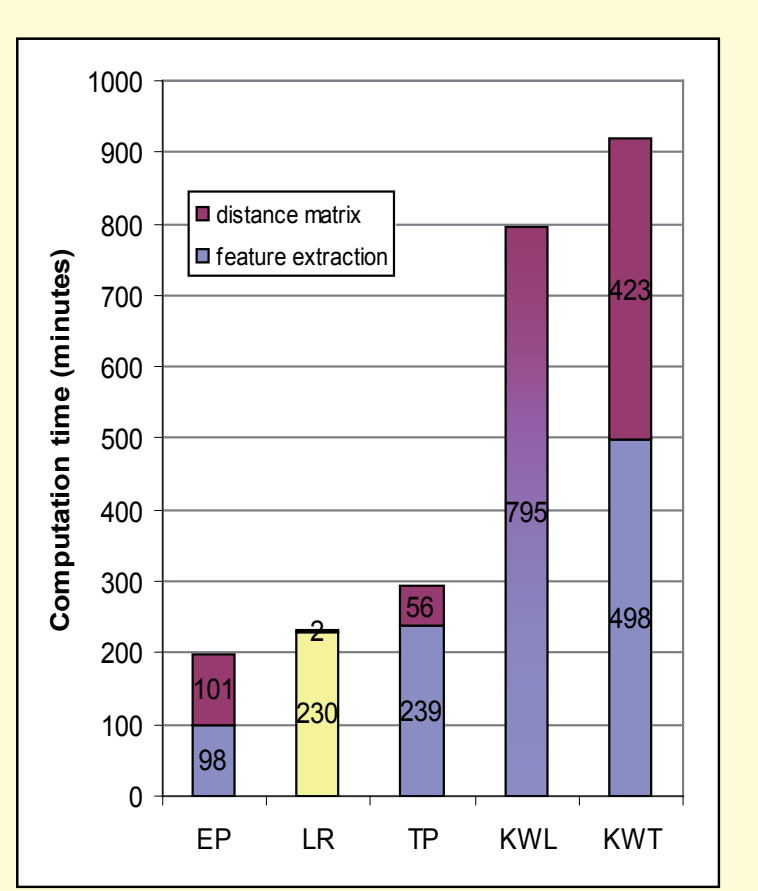
Audio Music Similarity and Retrieval



Human Evaluation (Friedman Test)



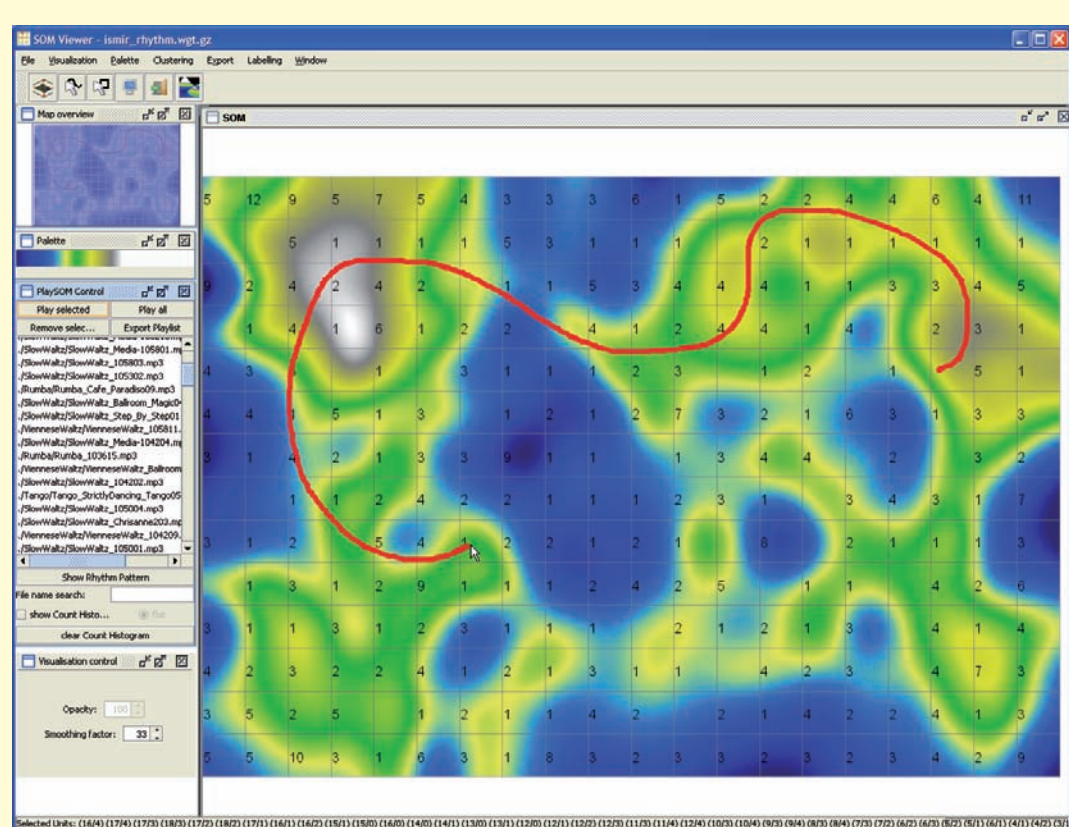
Evaluation based on meta-data statistics



Comparison of Computation times

Applications of the developed Audio Features for Music Retrieval

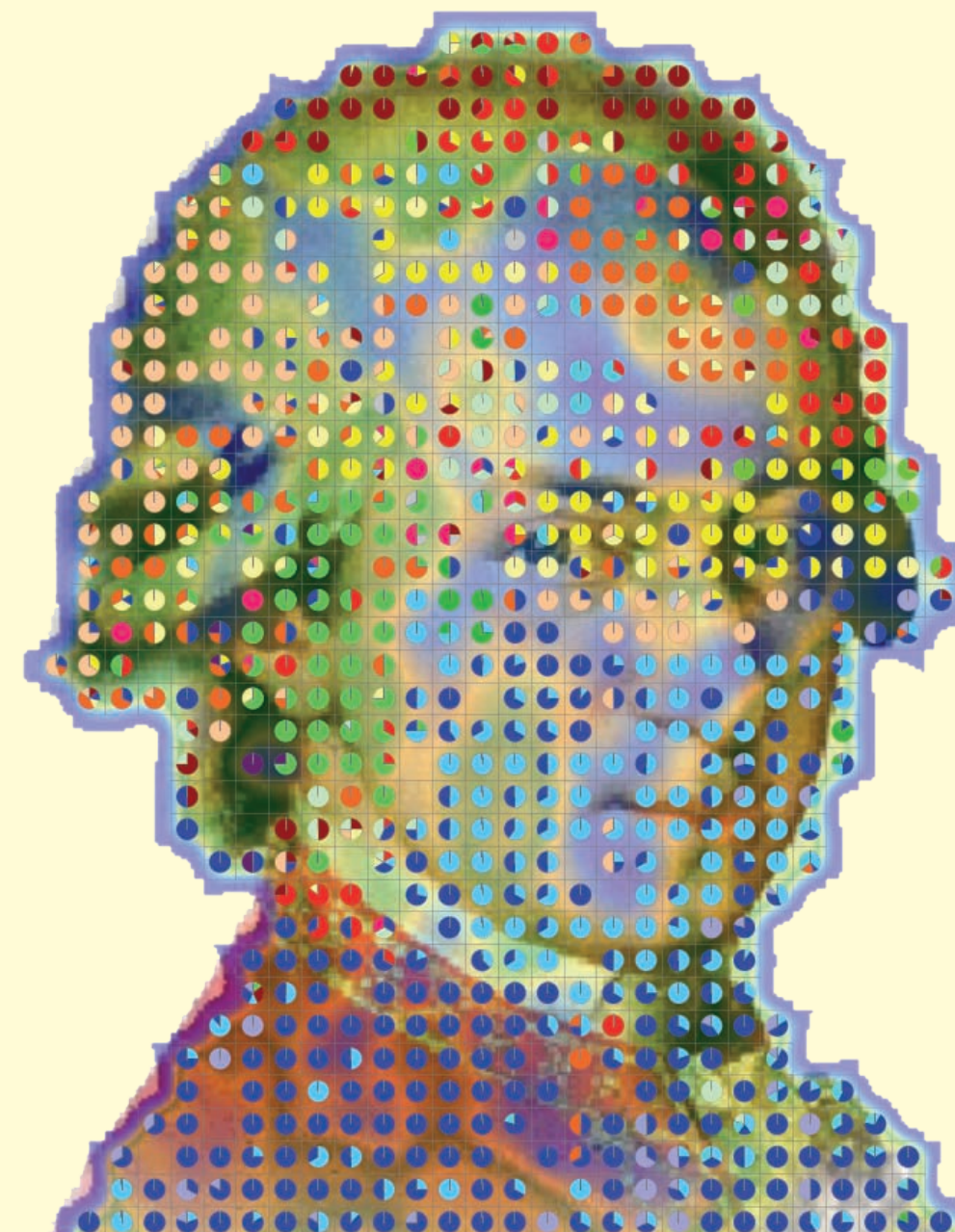
PlaySOM



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.ifs.tuwien.ac.at/mir/mozart 2442 pieces from 17 categories (categories subsequently overlaid)

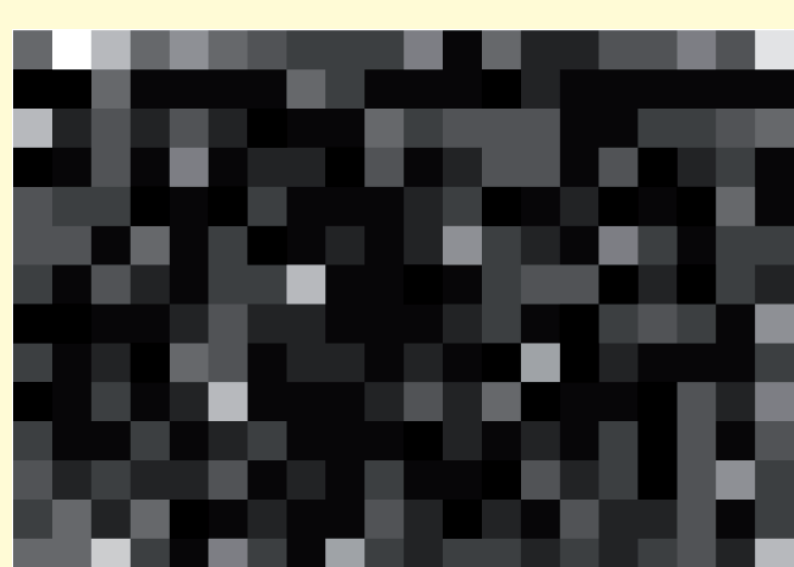


PocketSOMPlayer

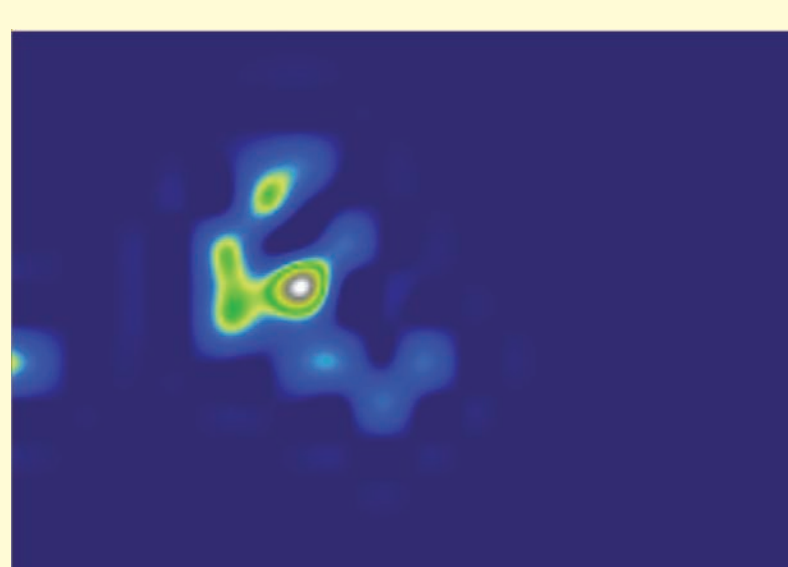
Export of Music Maps allows to explore and stream music collections on mobile devices (PDA, mobile phone)



Visualization Methods



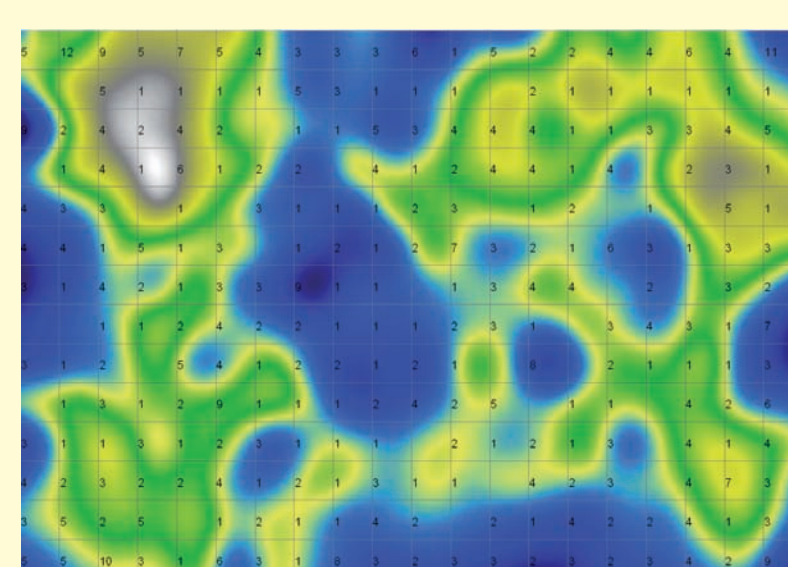
Hit Histogram



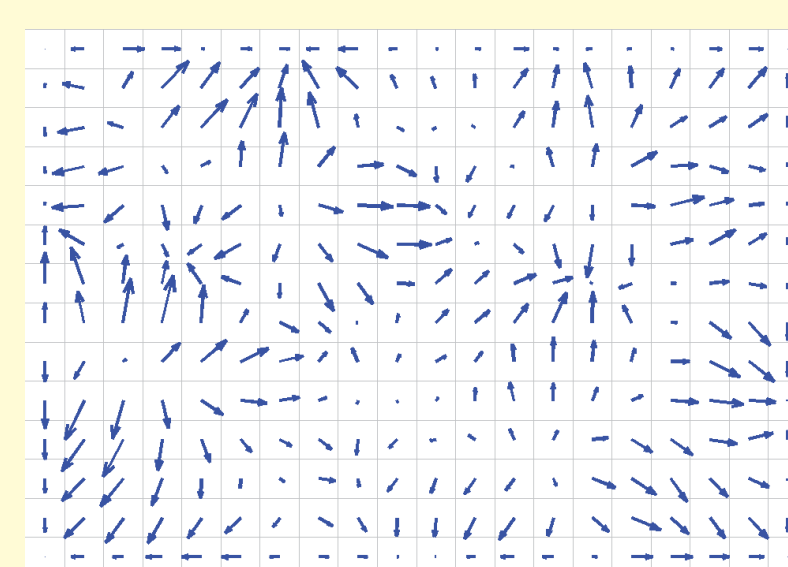
Query Hit Histogram (interp.)



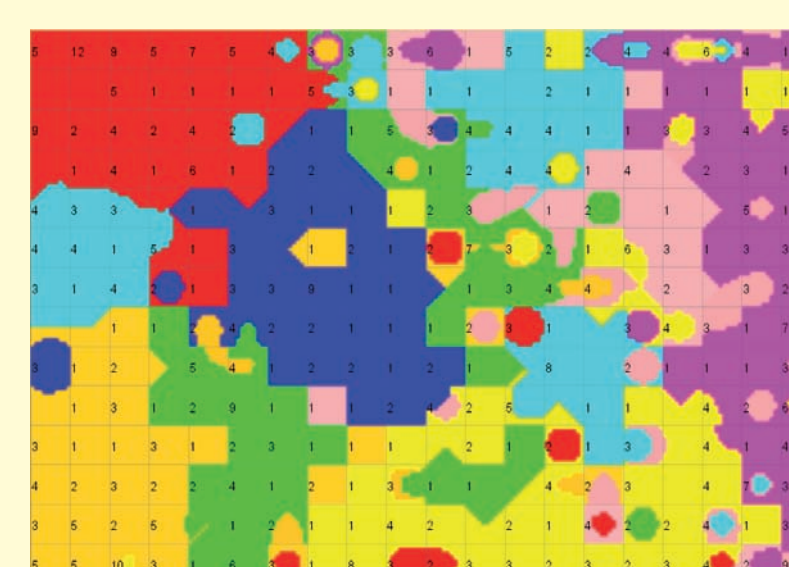
U-Matrix



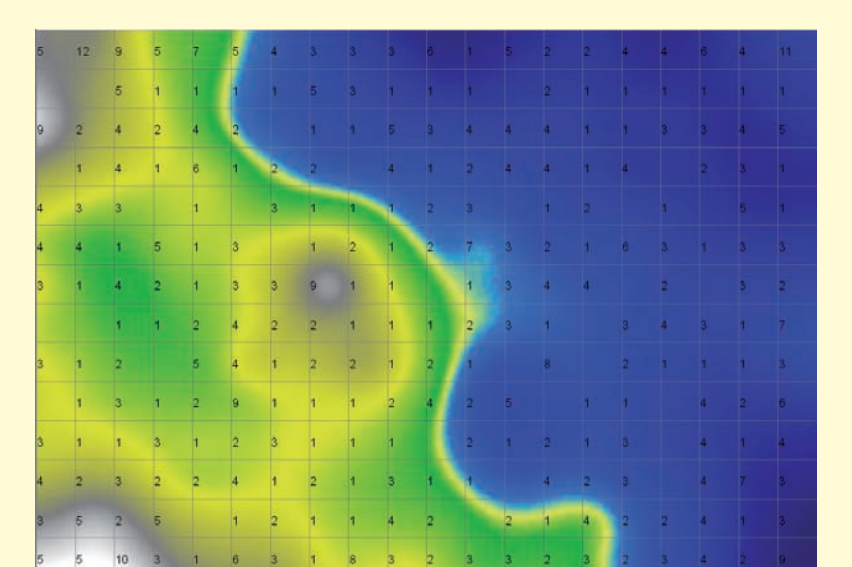
Smoothed Data Histogram



Gradient Field



Class Visualization



Weather Charts: Bass