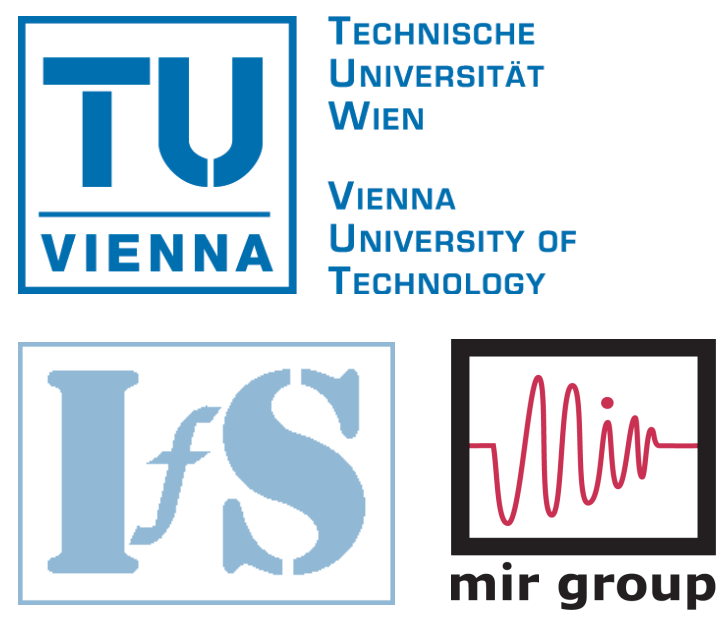


# Combining Audio and Symbolic Descriptors for Audio Music Classification and Similarity Retrieval

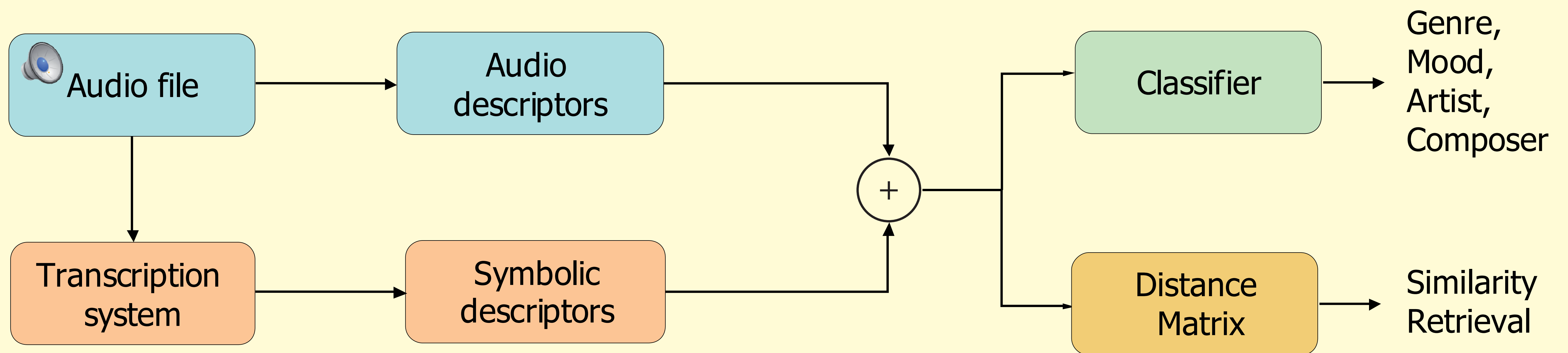


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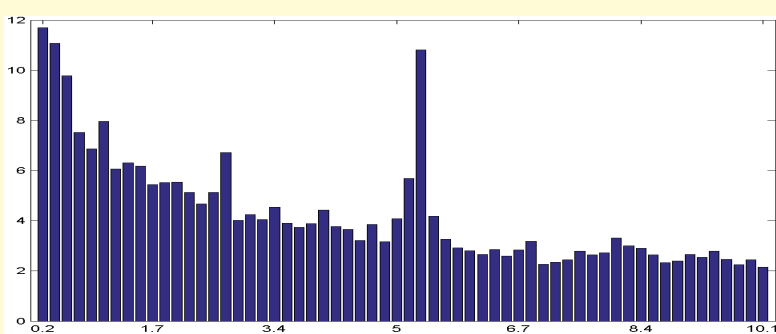


## System Overview

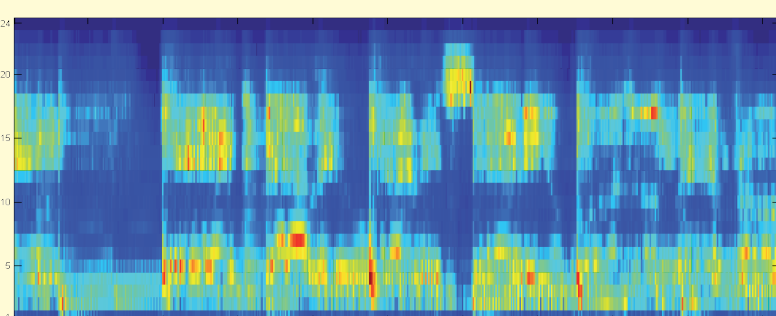


## Audio Features

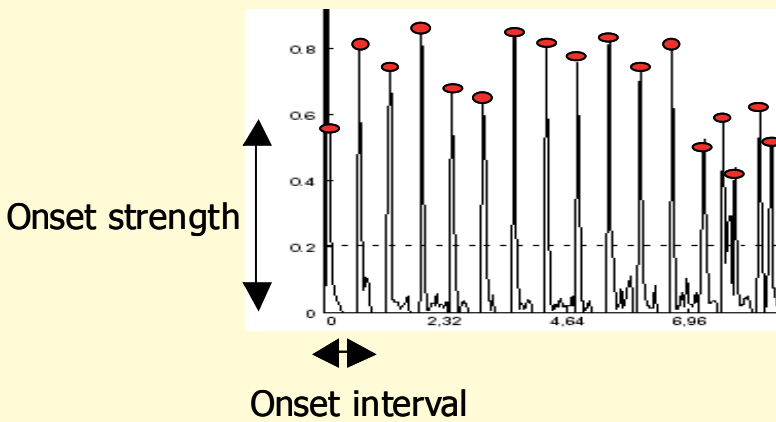
Rhythm Histogram (RH)  
rhythmic energy for 60 modulation frequency bins (60 dim.)



Statistical Spectrum Descriptors (SSD)  
statistical measures describing fluctuations on Bark-scale Sonogram (167 dim.)



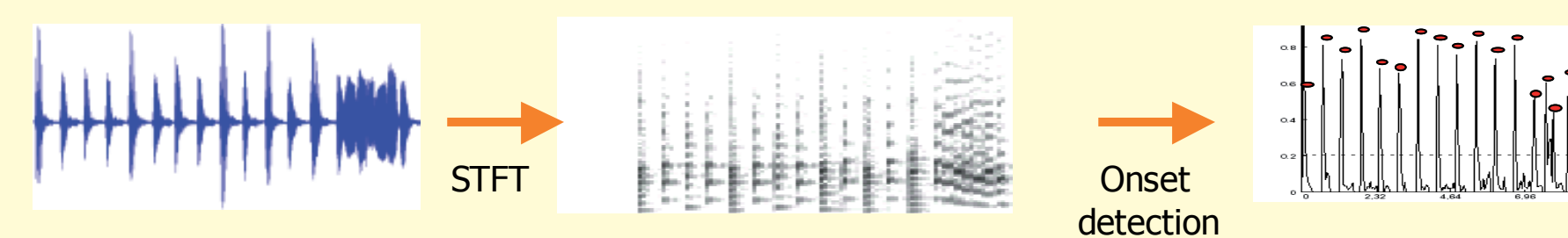
Onset Features  
statistical measures of onset strength & intervals (11 dim.)



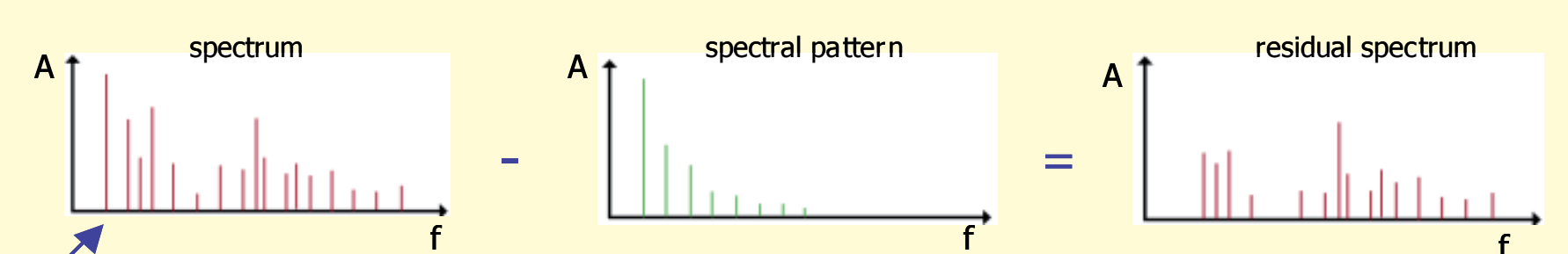
## Transcription

Polyphonic Transcription System:  
Simple and fast multi-f0 estimator

Only frames after onsets are analyzed to get notes



Algorithm:  
Sinusoidal Likeness Measure (SLM)  
Spectral peaks are f0 candidates if:  
- amplitude is higher than a given threshold  
- frequency is within the range [50-1200] Hz  
- close to the Western pitches  
Harmonics are identified  
Constant spectral pattern is subtracted  
Removal of f0 candidates according to thresholds



see details: MIREX Poster on Multi F0 estimation by Pertusa and Iñesta

## Symbolic Features

extracted from transcribed MIDIs

statistics of:

- note pitches
- note durations
- number of notes
- number of non-significant silences
- number of distinct pitch intervals
- Inter Onset Intervals
- etc.

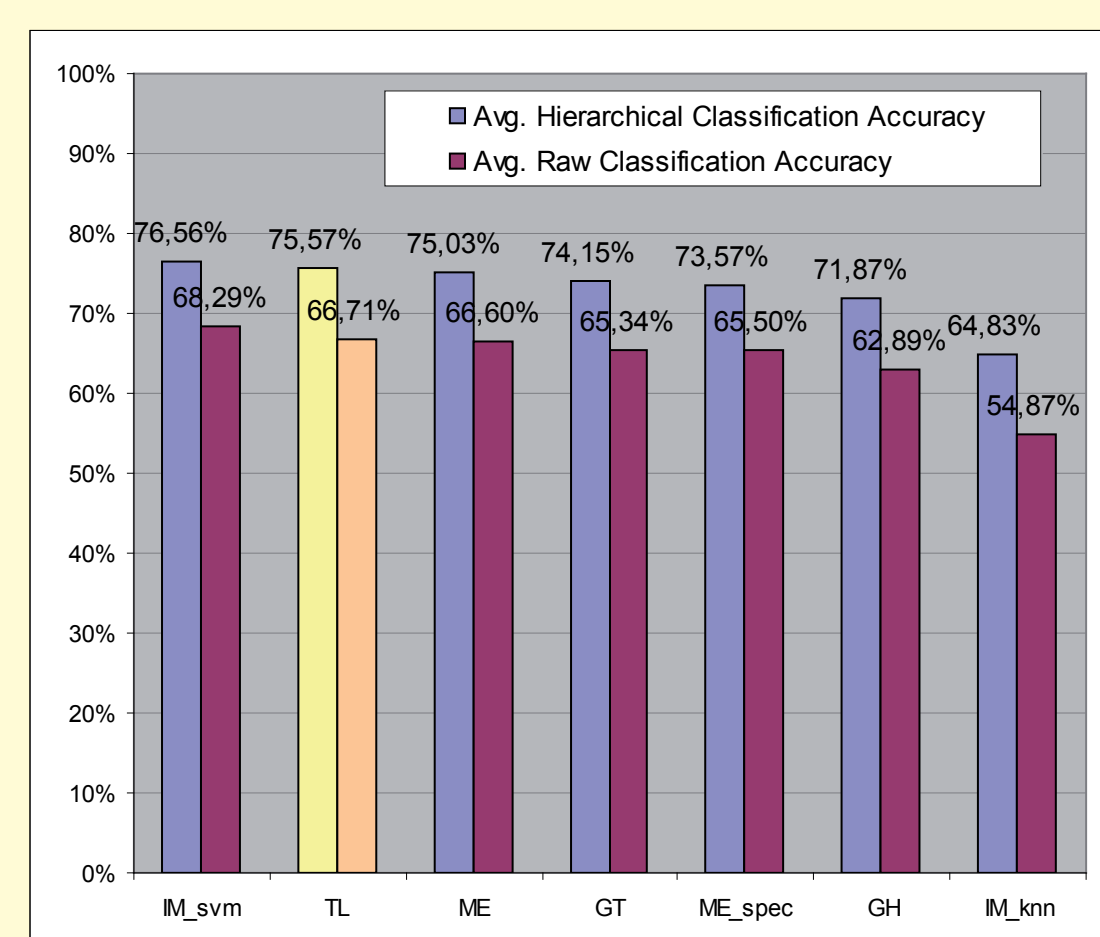


feature selection based on previous studies on symbolic genre classification

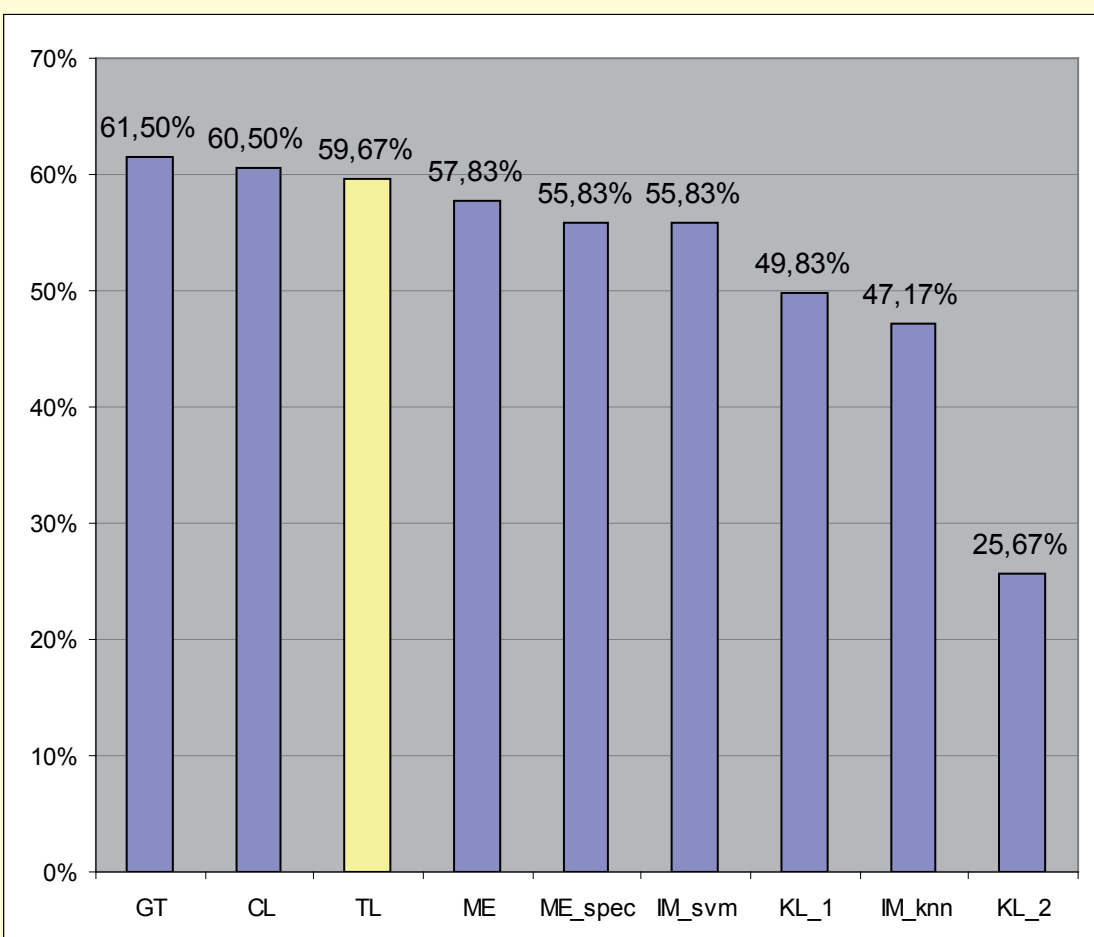
37 features in total

## MIREX 2007 Results

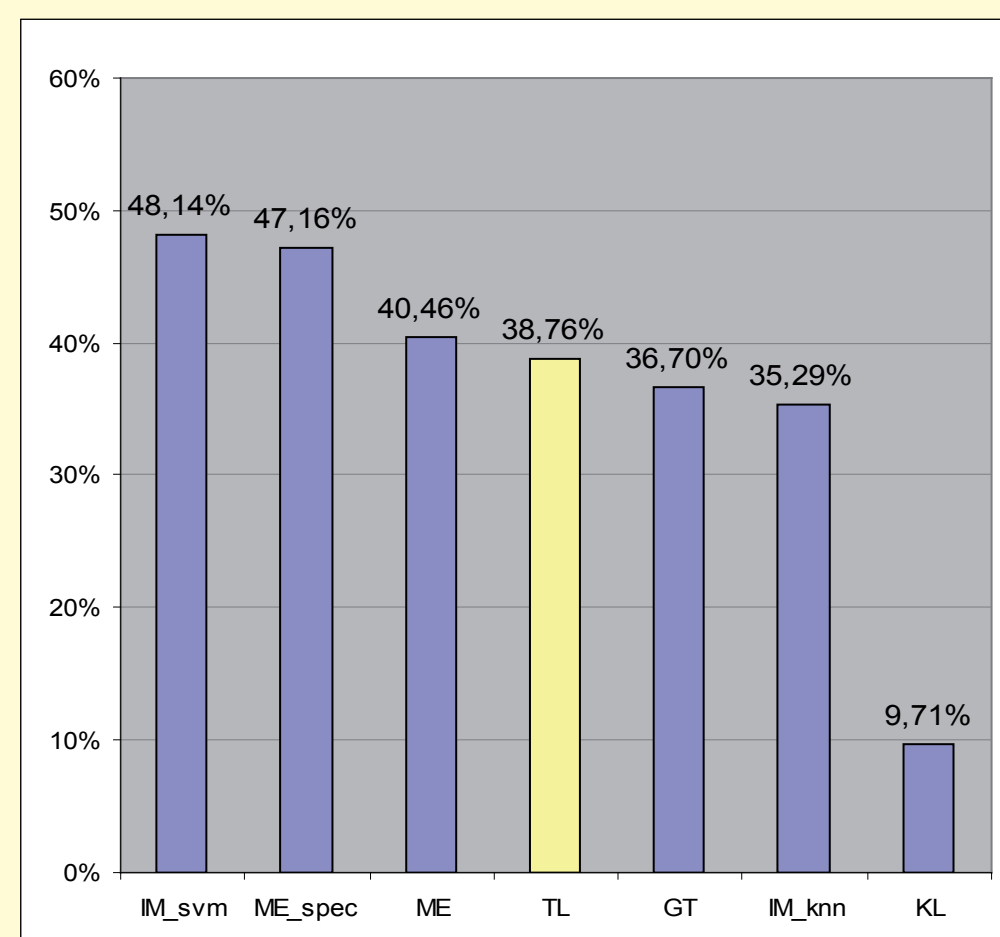
Genre Classification



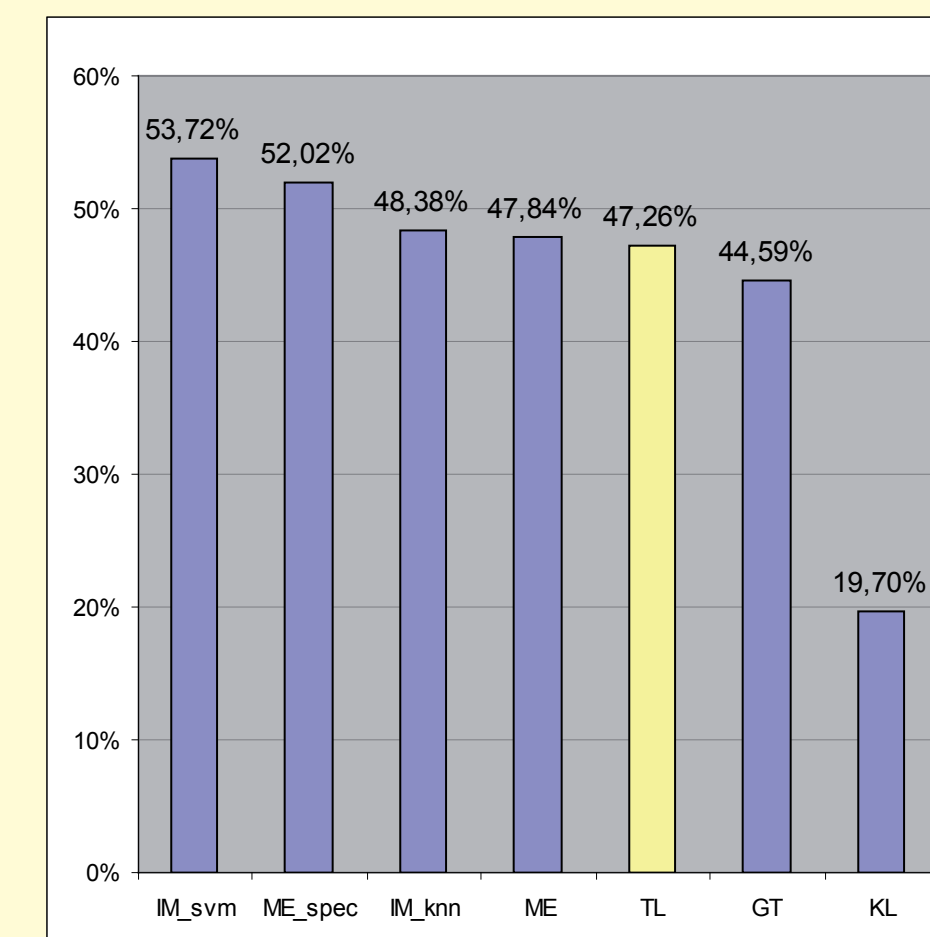
Mood Classification



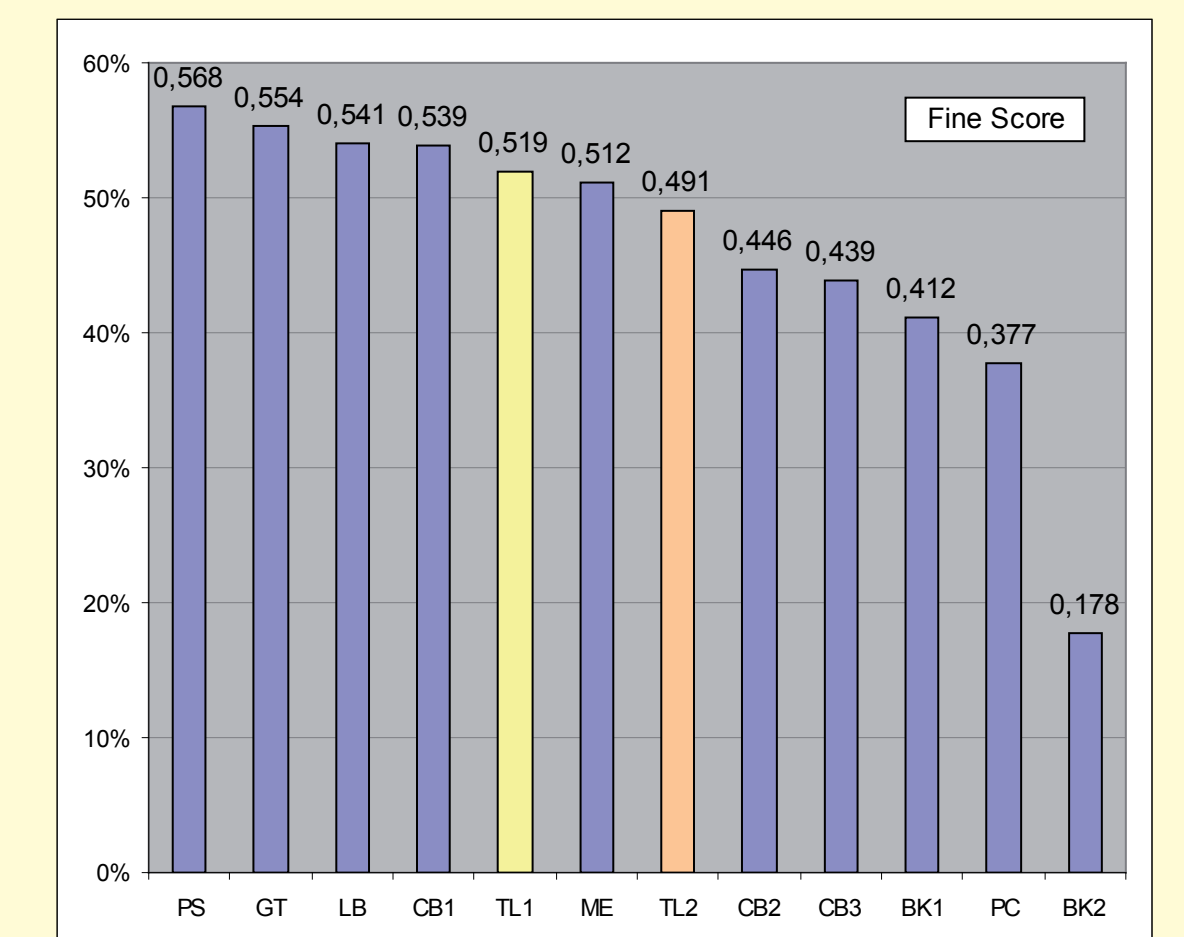
Artist Identification



Composer Id.



Audio Music Similarity and Retrieval



presented at

