SEGMENTATION, CLUSTERING, AND DISPLAY IN A PERSONAL AUDIO DATABASE FOR MUSICIANS

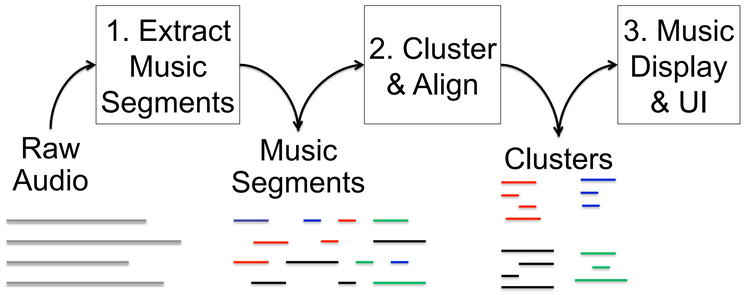
Gus (Guangyu) Xia , Dawen Liang, Roger B. Dannenberg, and Mark J. Harvilla
Carnegie Mellon University, Pittsburgh, PA

Overview

Goal:

Create and organize a musician's personal rehearsal audio database.

Three main components:

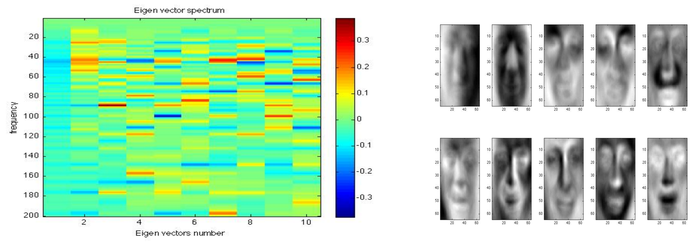


Segmentation

Goal: Separate continuous recordings into segments of music pieces based on music/non-music classifier.

Uses Eigenmusic features:

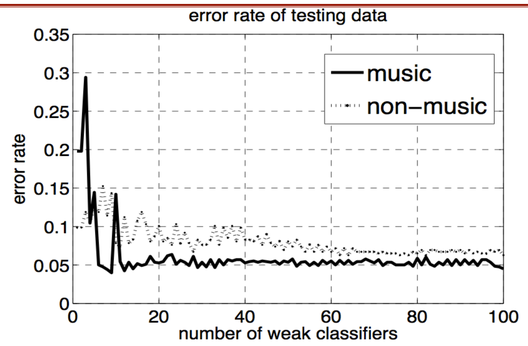
1.PCA of audio in frequency-domain
2.Chose the first 10 principal components



Eigenmusic vs. Eigenface

Adaboost classifier:

Implement a non-linear classification surface in the 10-dimensional Eigenmusic space by training a sequence linear classifiers (weak learners).



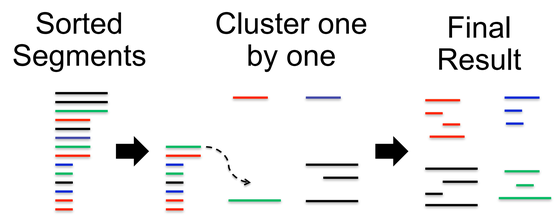
New

2-state HMM improves classification :

1. States: music vs. non-music
2. Observations: probabilistic interpretation of Adaboost outputs

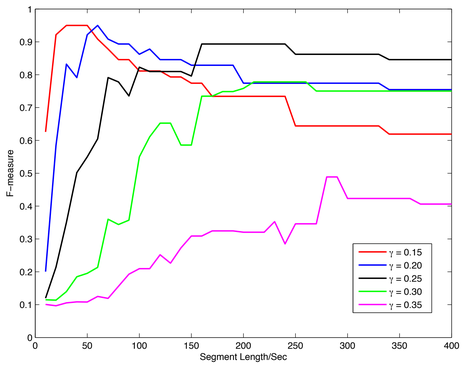
Clustering

Clustering algorithm (CENS matching):



Clustering evaluation:

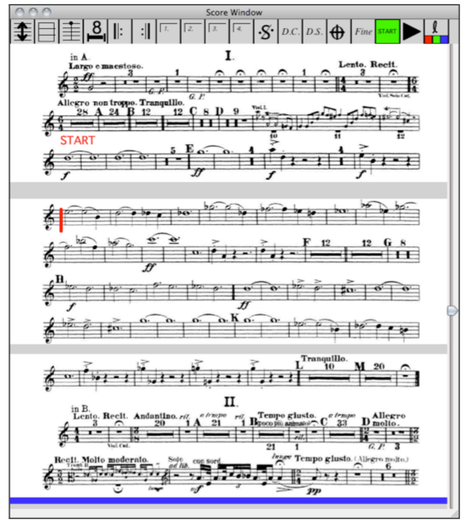
1. Two parameters:
   - Matching threshold γ & Segment length t
2. Precision & Recall



Browsing/Access

Use music notation *image* files. Manually annotated with measure locations, e.g. by tapping measures while listening to a full recording.

- Display as *output*: indicates position while listening to recordings
- Display as *input*: clicking on a location can pop up a menu of recordings that contain the measure



Conclusion

Current status:
- All 3 components are implemented.
- Integrated system implementation in progress

- We have demonstrated the feasibility of a personal musician's rehearsal audio database.
- Automatically organizes recordings from rehearsals.
- **Assists musicians to find, listen to, or play along using music notation as an active interface to a library of audio recordings.**

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