

Tonality in *Raag* Music



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Objectives

- Introduce a simple theoretical model of tonality for raag music
- Describe series of visualizations of raag space based on pitch-class distributions (PCD)
- Experimental directions

Motivation

- Why study tonality cross culturally?
- Is there a common mechanism for the processing of hierarchical pitch structures?

What is *raag*?

Scale abstraction

Ascending: C D G E F A G C
Descending: C B A G F G D C

.....
Expression



D G E F A G E ^{G F E F} F D C

Set of motives

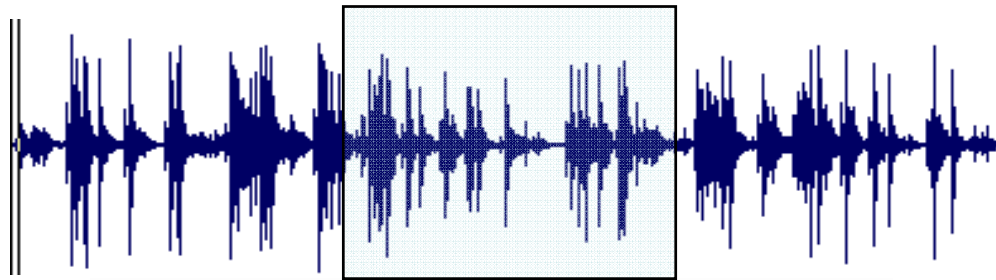
[—]
D G

^{G F E F}
E F D C

E F A G

[—]
G E

A simple model of tonality



Short-term memory window



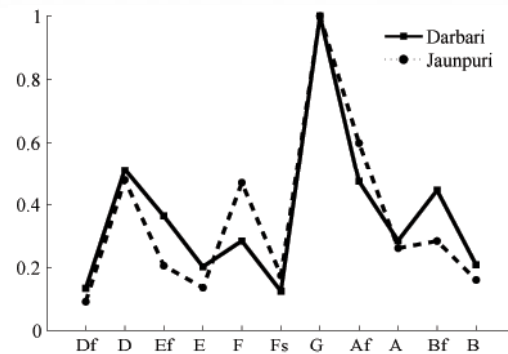
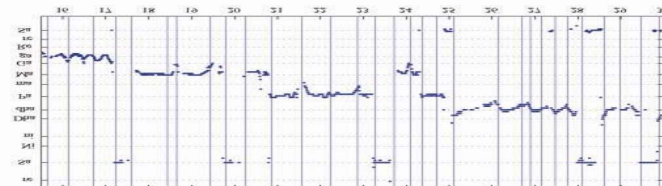
Pitch-detection



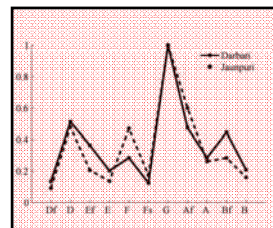
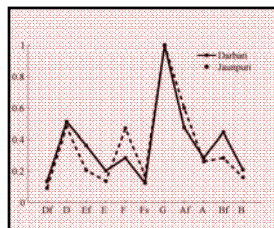
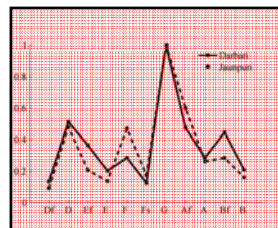
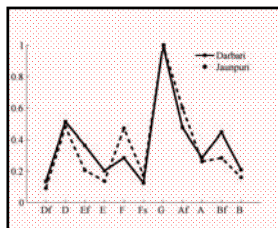
Local PCD



Compare with stored
schemas



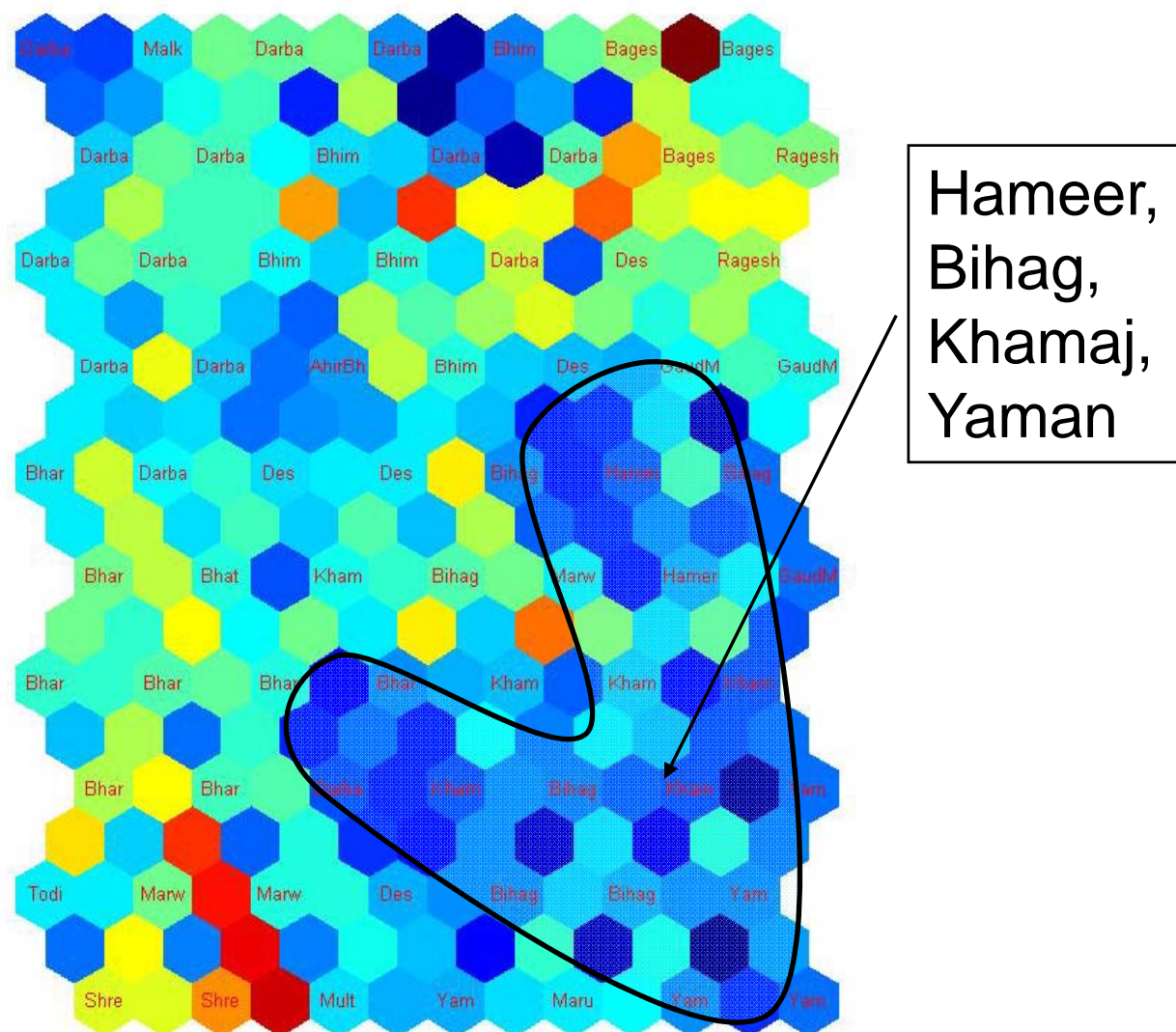
$D(X,Y)$



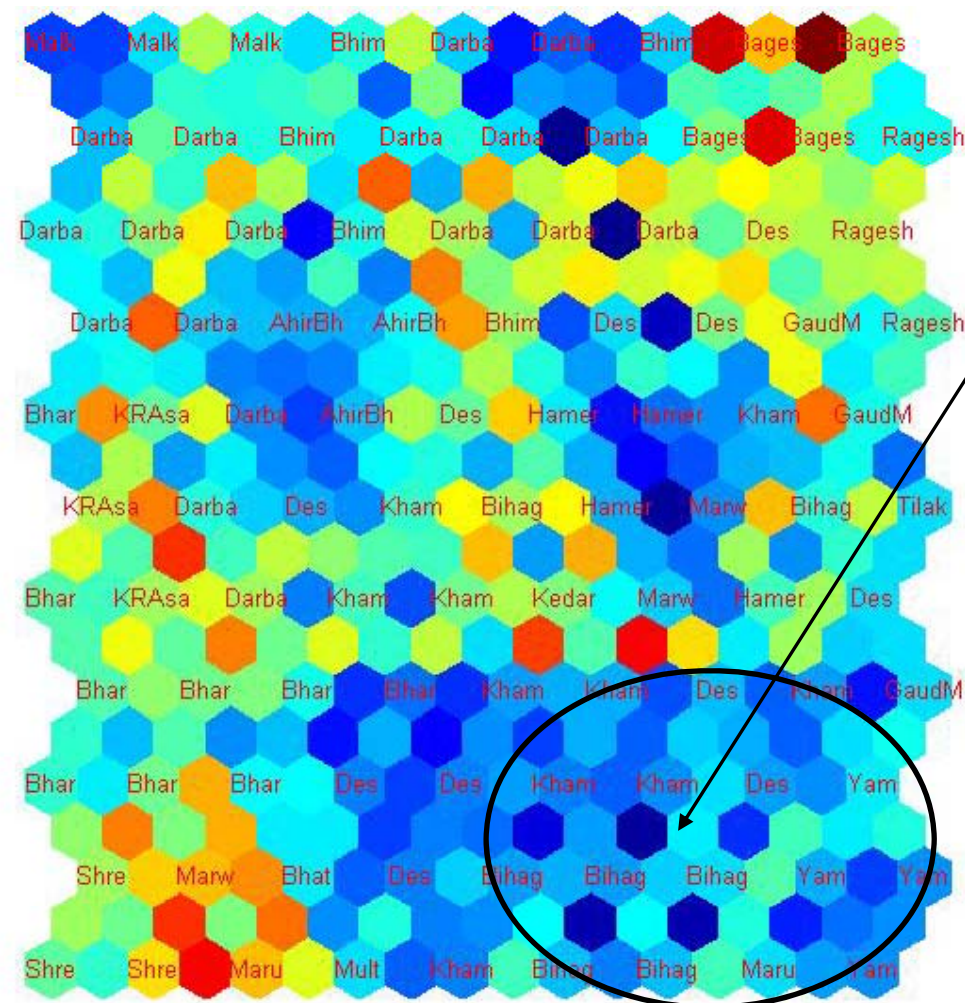
Visualizing *Raag*

- Project PCD-based representation of *raag* onto low-dimensional space using SOM
- How many tonal schemas are there?
- Perceptual distance between raags

Empirical Prototype *Raag* Map

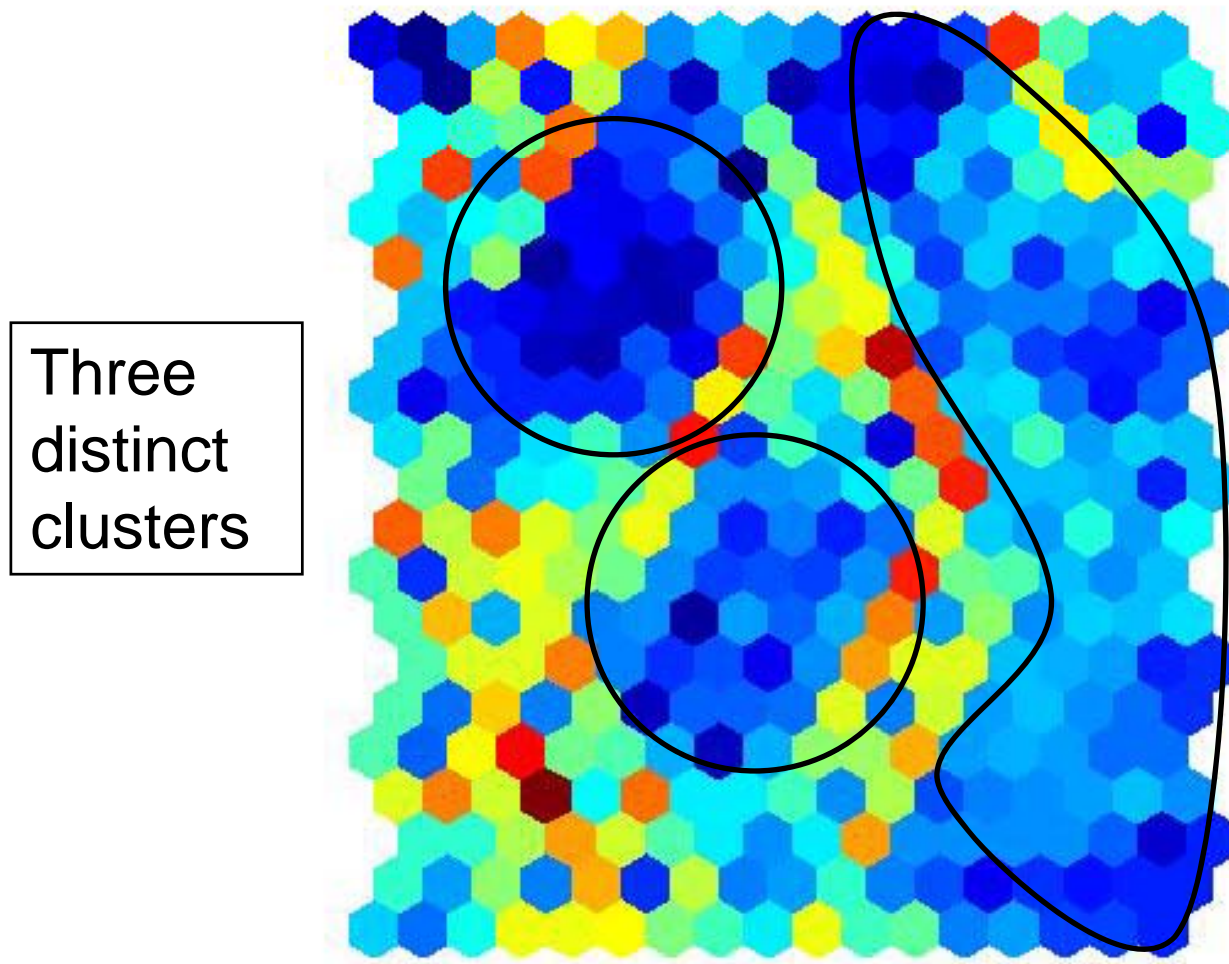


Empirical Segment-based



Desh,
Bihag,
Khamaj,
Yaman

Sub-raag structure (*Malkauns*)



Discussion

- Visualizations suggest:
 - number of schemas less than number of nominal raags
 - sub-raag and super-raag (*thaat*) levels may be encoded (Castellano et al.)?
- Are representations of raag-schemas instance based or model based? Does this change with exposure?
- Experimental work using reaction-time paradigm