Tuning analysis

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Agenda

- Introductory presentations (Xavier, Martin, Baris) [30 min.]
- Musicological perspective (Martin) [30 min.]
- Corpus-based research (Xavier, Baris) [30 min.]

----- *break* ------

- Rhythm analysis (Martin, Baris) [30 min.]
- **Tuning analysis (Baris) [30 min.]**
- Closing remarks (Xavier) [10 min.]
- Open discussion [20 min.]

A quick introduction to Makam

Design for melodic contour by specification of:

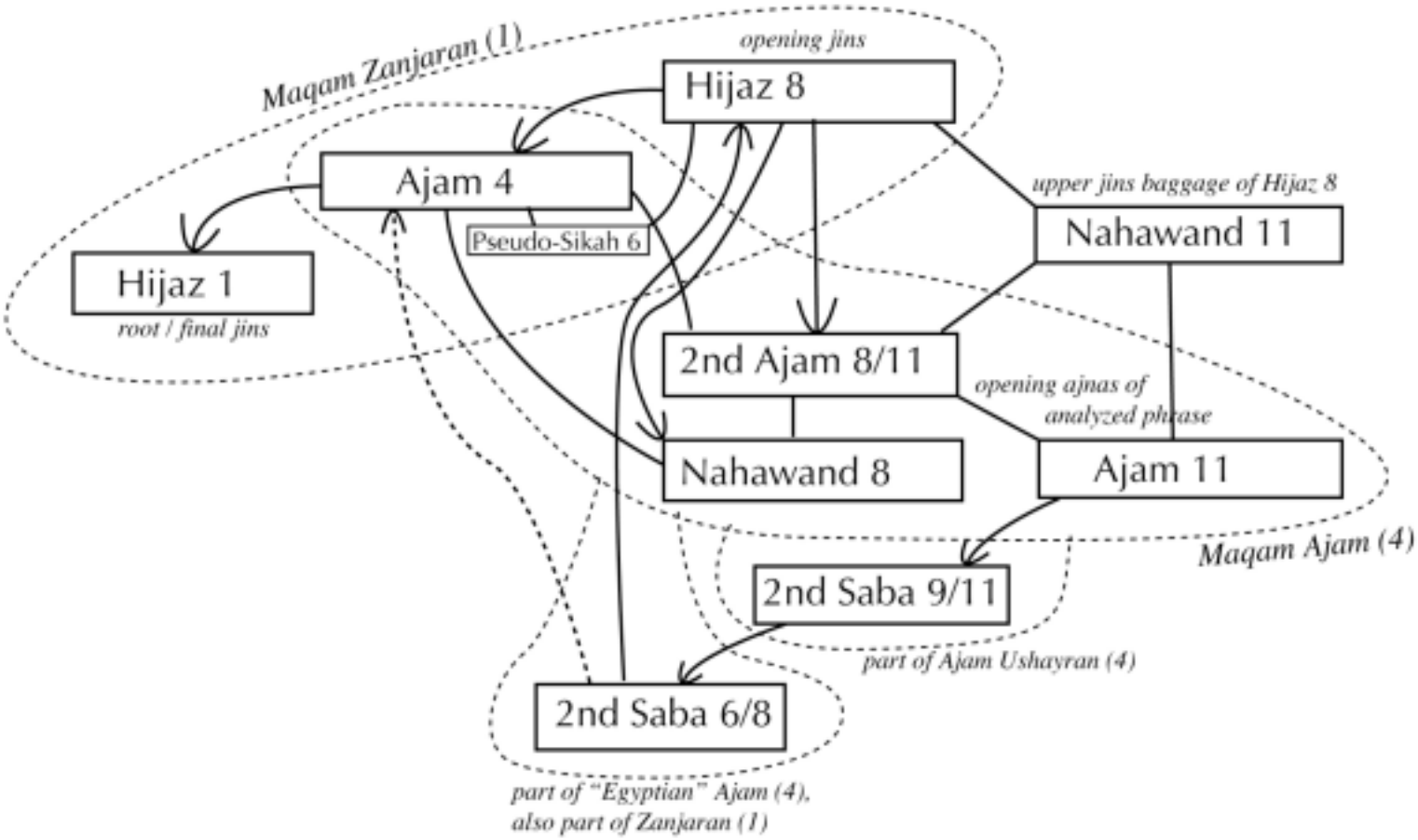
A scale:

- Set of *Jins* (*tri-tetra-penta chords*) including microtonal intervals
- Functional hierarchy of tones

Melodic progression:

- Ordered progression of 'flavors' (melodies created by functional use of *tri-tetra-penta chords* to emphasize certain pitches)

Representation of Maqam Zanjaran within the Egyptian and Syrian *maqam tradition*

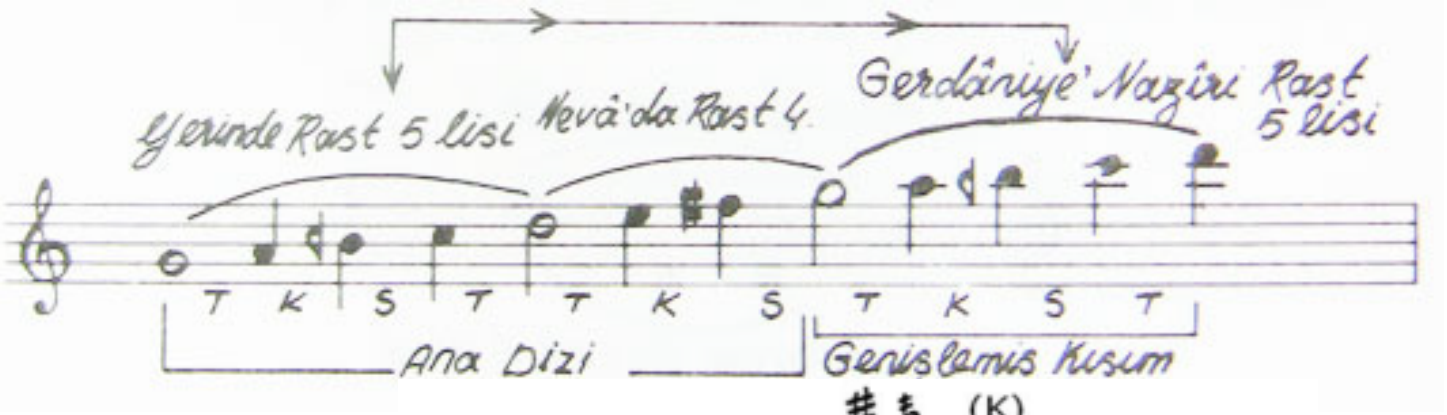


Shumays, S. A. (2013).

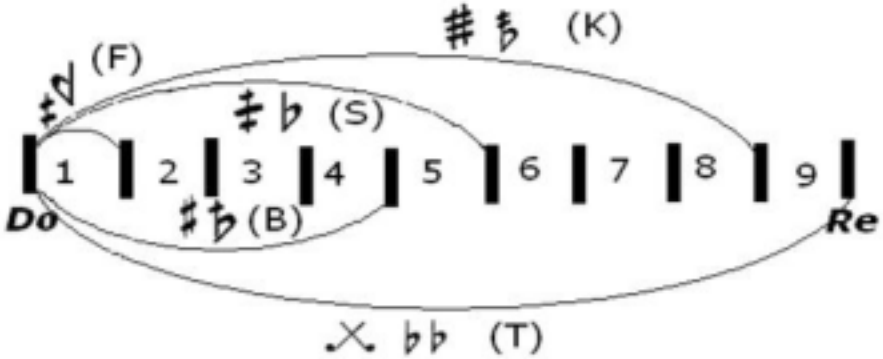
Scales, jins/(tri-tetra-penta)chords, range, junctions

Makam Rast

~ G Major

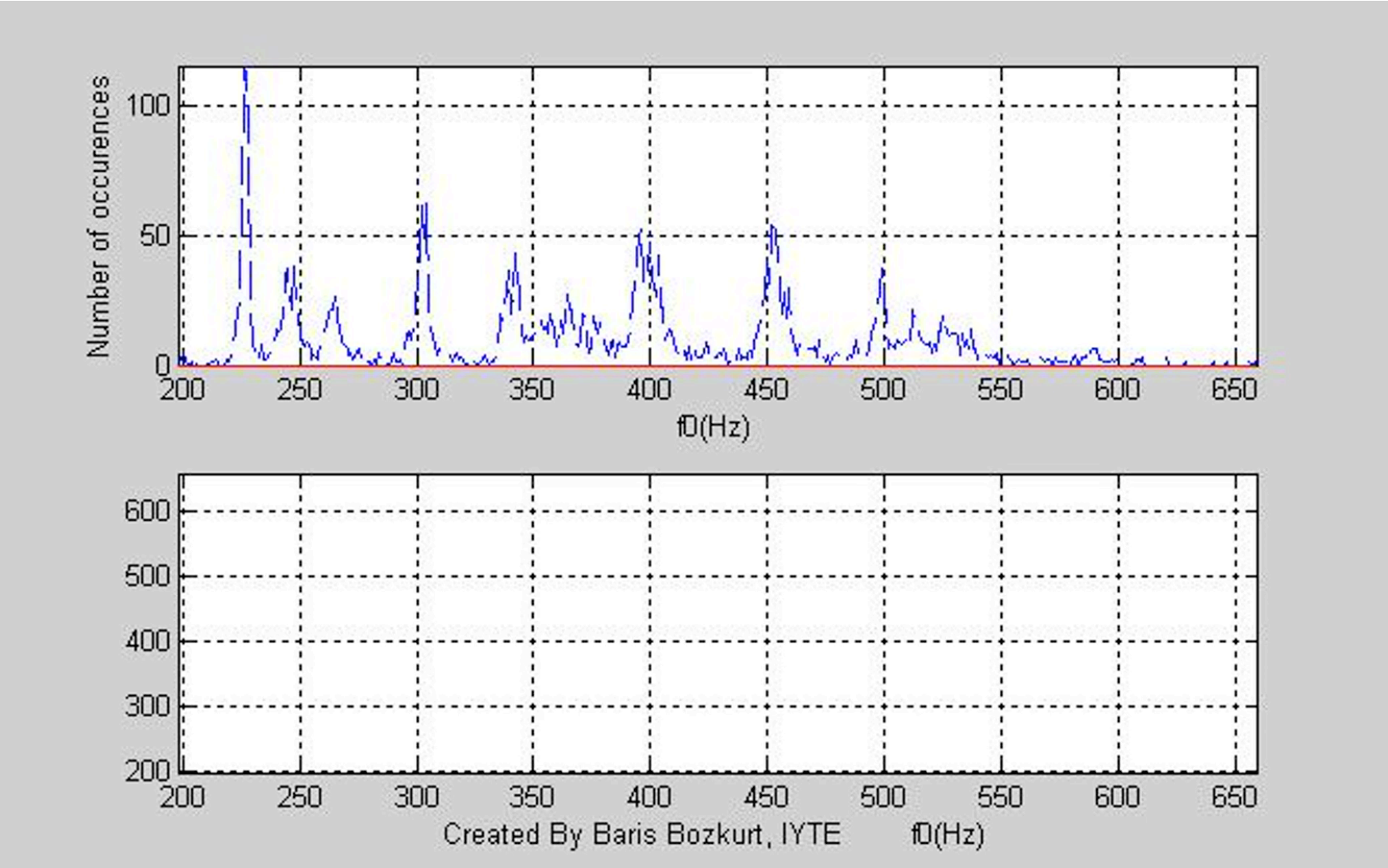


Theoretical intervals:
B,S,K,T,A_{12}, A_{13}



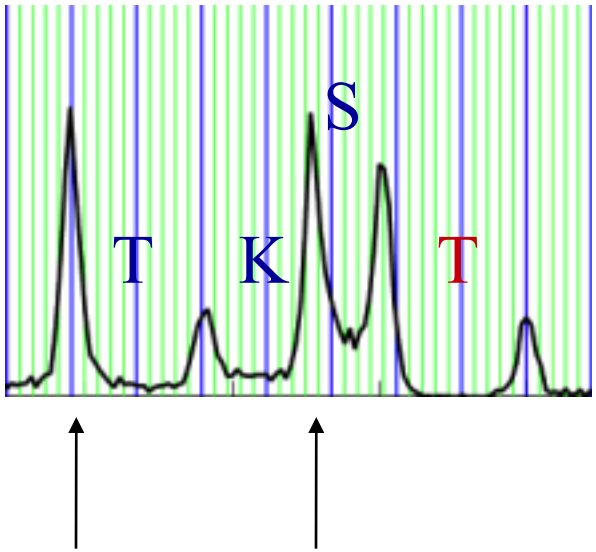
# of distinct chords: ~ 15

Pitch distribution



Some basic jins/ tri-tetra-penta chords

Rast

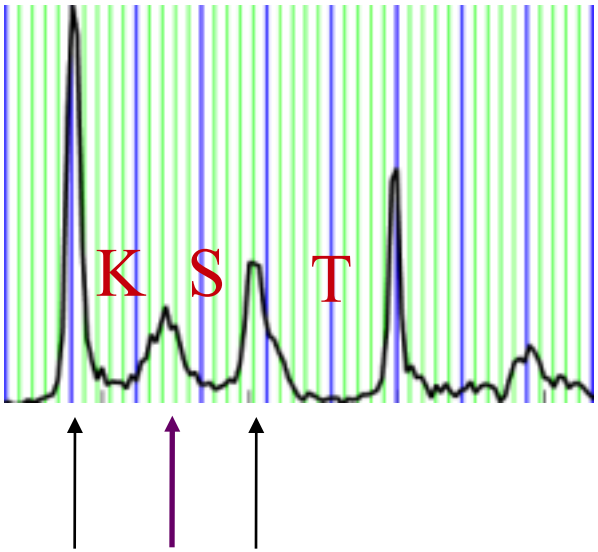


Major third

PLAY

Rast peşrev

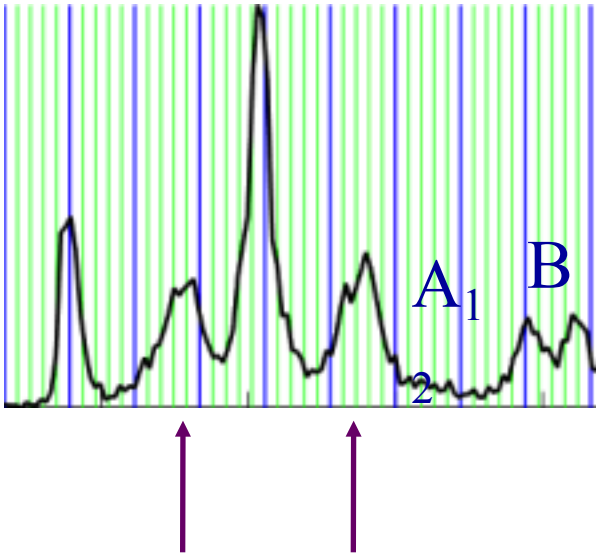
Hüseyni/Uşşak



Minor third

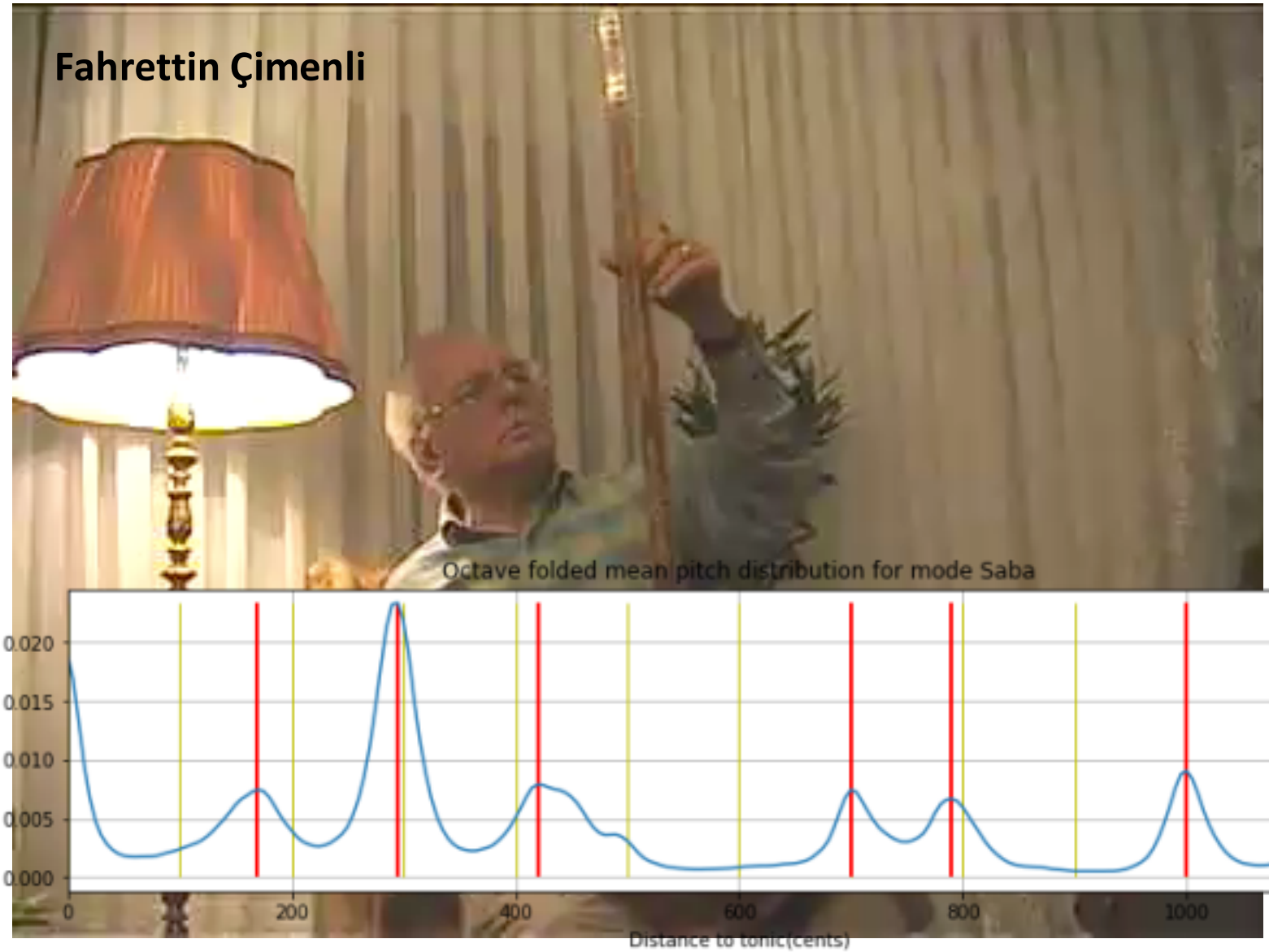
Uşşak peşrev

Saba



Quarter tones??

Pitch distributions for tuning analysis



Tuning analysis, Turkish makam music

Hands on: tuningAnalysis_SingleRecording.ipynb

tuningAnalysis_SetOfRecordings.ipynb

Tuning analysis for a single recording

Here, we demonstrate tuning analysis of a single recording in makam Huseyni (a commonly used makam with a scale close to western A dorian with a characteristic second tone lower in pitch (resulting in two microtonal intervals around it)). The following steps are carried:

- We first download a specific recording: https://musicbrainz.org/recording/9d195cbe-8e9f-47ef-83f0-e7c0b8af1697, Dunya direct-link: http://dunya.compmusic.upf.edu/makam/recording/9d195cbe-8e9f-47ef-83f0-e7c0b8af1697 .It includes automatically alligned scores. You can first listen to the recording through Dunya.
- Then pitch analysis and pitch distribution computation is carried
- Tonic annotation is accessed from Dunya and further interval distributions are computed (with respect to tonic)
- Octave folding and automatic peak picking applied to detect scale degrees' distance to the tonic
- Interval list stored in the Scala format (http://www.huygens-fokker.org/scala/) to be able to sonify the intervals using computer keyboard

Makams using the same scale

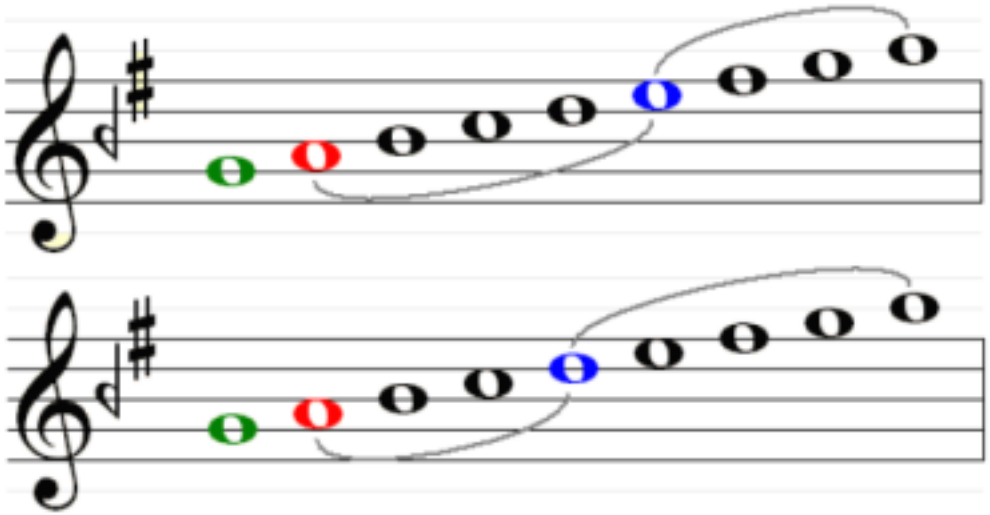
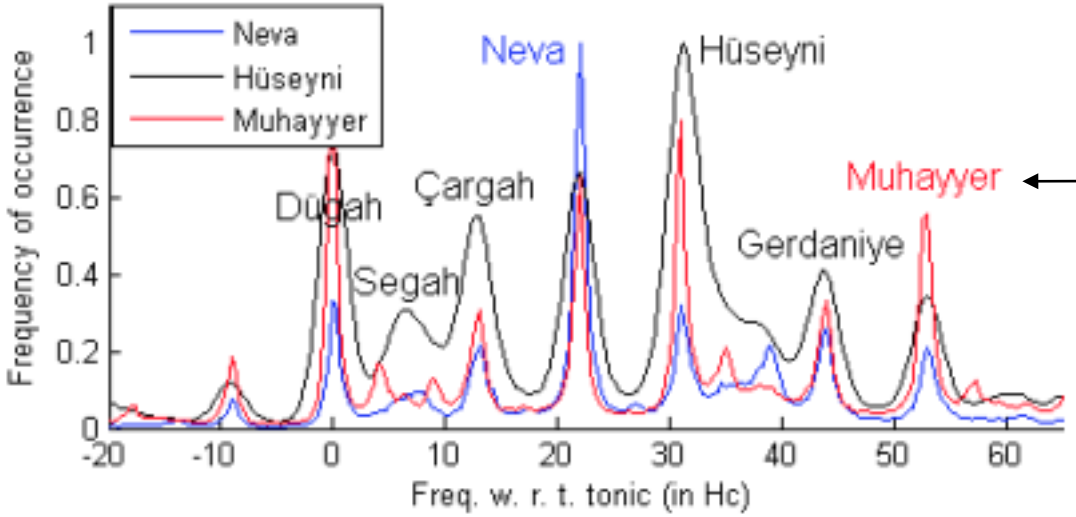


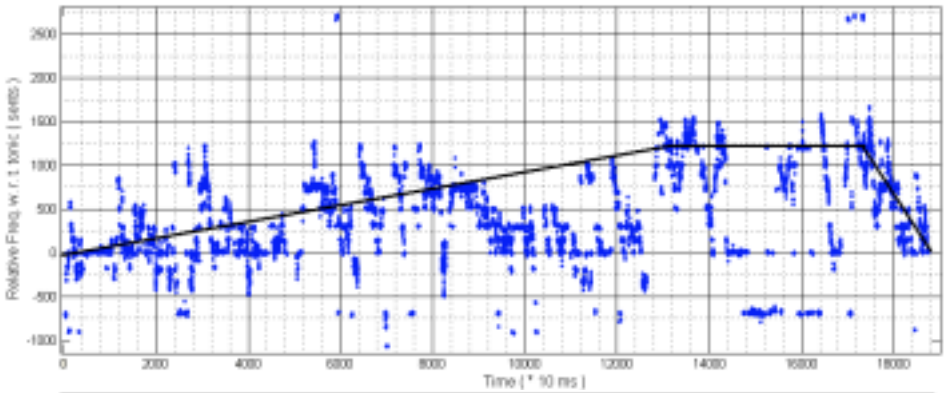
Figure 10. Scales for makams: top) Hüseyni, Muhayyer, Gülizar, bottom) Neva, Gerdaniye, Tahir.



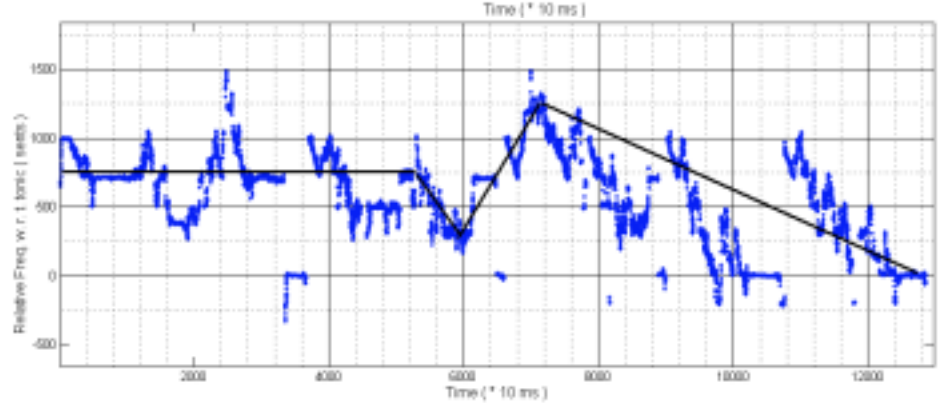
Pitch names

Categories for melodic progression

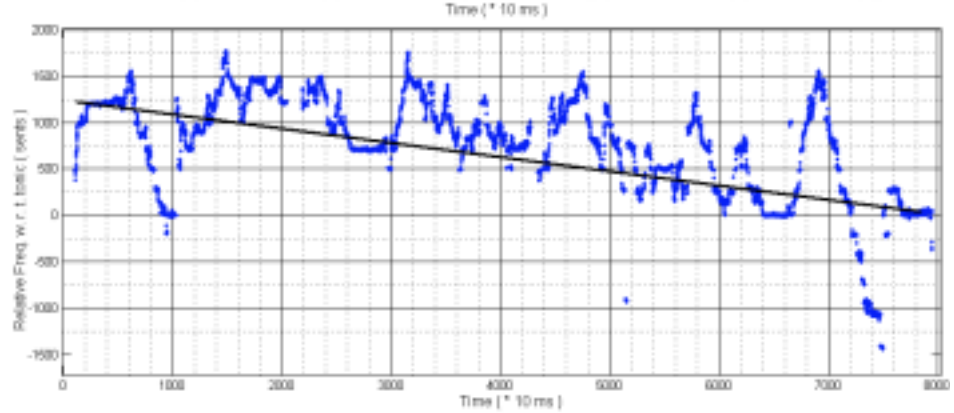
Ascending



Ascending - Descending

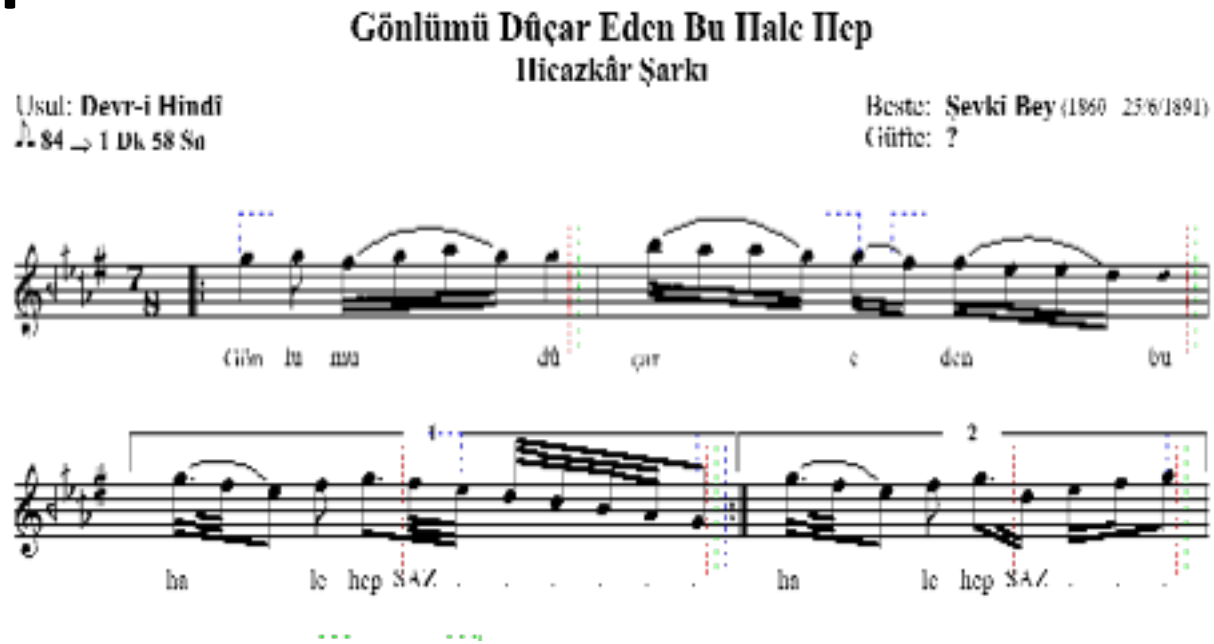


Descending



Not yet verified with a corpus-based study

SymbTr



Index	Code	Note53	NoteAE	Comma53	CommaAE	Num.	Denum.	Ms	LNS	VelOn	Syll
1	9	La4	A4	305	305	1	4	909	95	96	Ben
2	9	Do5#4	C5#4	322	322	1	4	909	95	96	gam
3	9	Si4b4	B4b4	310	310	1	8	455	95	96	li
4	9	Do5#4	C5#4	322	322	1	8	455	95	96	ha
5	9	La4	A4	305	305	3	8	1364	95	96	zan
6	53			0	0	0	0	0	0	0	
7	9	Re5	D5	327	327	1	4	909	95	96	sen
8	9	Do5#4	C5#4	322	322	1	8	455	95	96	se
9	9	Re5	D5	327	327	1	8	455	95	96	ba

Turkish Makam Music Symbolic Data Collection

https://github.com/MTG/SymbTr/releases/tag/v2.0.0

2200 pieces: 150 distinct makams, about 100 usuls, 50 forms, 865,000 musical notes, 80 hours nominal playback time.

Scores in formats: Midi, musicXml, mu2, pdf,

Karaosmanoğlu, M. K. (2012). A Turkish makam music symbolic database for music information retrieval: SymbTr. Proc. Int. Society for Music Information Retrieval (ISMIR).

M. K. Karaosmanoğlu, Barış Bozkurt, Andre Holzapfel and Nilgün Doğrusöz Dişiaçık, "A symbolic dataset of Turkish makam music phrases", Proceedings of FMA, 2014.

Melodic progression

Hands on: symbolicDataPro_symbTr.ipynb

Symbolic data processing, Turkish music case

In this notebook, the SymTr data (Turkish Makam Music Symbolic Data Collection) (http://compmusic.upf.edu/node/140 , https://github.com/MTG/SymbTr) is used. Here we demonstrate accessing pieces in a specific form and makam, reading a specific a section of the form and ploting the melodic curves. The makams are chosen to apply the same scale but different melodic progressions ('seyir').

The following steps are carried:

- Downloading SymbTr data from the github repo
- Printing a list of makams and forms sorted with respect to the number of files in those categories
- Plotting melodic curves from the first sections in saz-semaisi form in two makams: rast and mahur.

Automatic makam, raga,… recognition

To some level similar to the automatic tonality detection problem for western music.

Some implementations for automatic makam detection:

Using chroma features:

https://github.com/emirdemirel/Supervised_Mode_Recognition

Using pitch distributions:

https://github.com/altugkarakurt/morty

https://github.com/furkanyesiler/pitchdistamr

Creating subsets of data for mode recognition tests

Hands on: generateFileLists4Collections.ipynb, formExpSubsets4ModeRecognition.ipynb

This notebook targets accessing Dunya data and collecting file lists for several collections.
The main aim is to create subsets of data for mode and rhythm mode recognition experiments and the process is split into two notebooks.
In this first notebook, only the list of files available in meta data is created and saved in a pickle file. For each recording the following information is included:

- Files available for that recording, MusicBrainz id (mbid), Mode information (raga, makam, etc), Rhythm mode information (tala, usul, etc)

Then, the second notebook (formExpSubsets4ModeRecognition.ipynb) reads this file and forms the subsets by grouping recordings with respect to mode or rhythm mode while also checking available files (ex: tonic annotation) for the recording