

Probabilistic Modelling of Antonio Carlos Jobim's Music

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This presentation summarizes a broad theoretical-analytical investigation, on the frontier between music and mathematics, and whose main goal is to systematically map Antonio Carlos Jobim's compositional style. The constructed database consists of harmonic, melodic and rhythmical aspects of a corpus of 145 Jobim's songs, and the musical aspects are described in this framework using Markov structures and relating musical expectancy with probability and entropy.

Related publications:

- C. Almada, H. Carvalho (2022) “Entropy, Probabilistic Harmonic Space, and the Harmony of Antonio Carlos Jobim”, *Musica Theorica*, v. 7 n. 1 (to appear)
- C. Almada (2022) *A Harmonia de Jobim*. Campinas: Editora Unicamp.



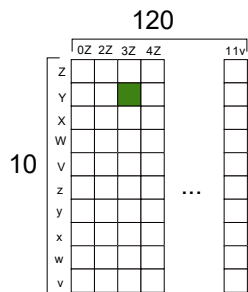
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Abstract representation of musical aspects

Harmony:

- Chord type
- Bass
- Root
- Function
- Mode
- Key
- Measure

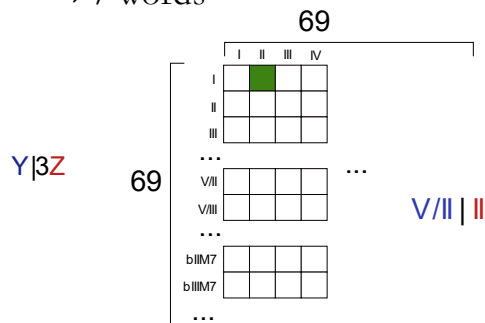


Melody:

- Segmentation
- Alphabet of ϵ -letters
- $\Rightarrow \epsilon$ -words

Rhythm:

- Segmentation
- Alphabet of r -letters
- $\Rightarrow r$ -words



The rhythmic alphabet

a			n		
b			o		
c			p		
d			q		
e			r		
f			s		
g			t		
h			u		
i			v		
j			w		
k			x		
l			y		
m			z		



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Example: abstraction of musical elements

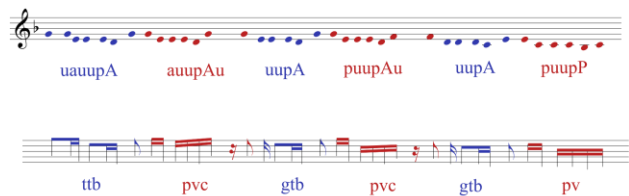
The girl from Ipanema
(Tom Jobim & Vinicius de Moraes)

HARMONY

root	5	7	7	6	5
bass	5	7	7	6	5
chord type	90	89	122	89	90
	2	4	2	3	0
function	1	55	2	81	1
key	5	5	5	5	5
mode	0	0	0	0	0
measure	1	3	5	6	7



MELODY

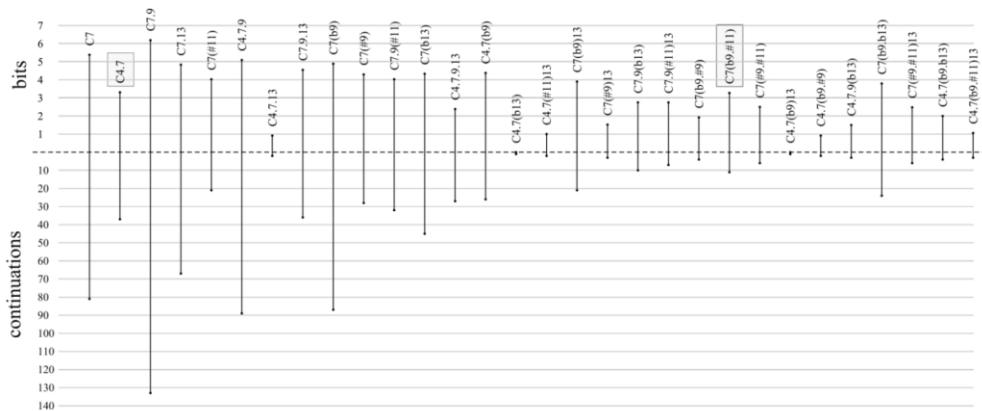
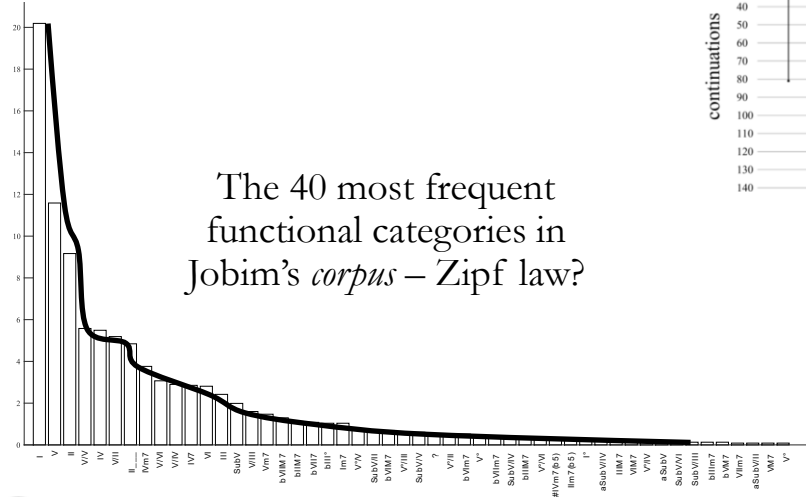


PITCHES

RHYTHM



Partial results, further investigations and conclusions



Entropy vs. continuations of chord types – style?



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