

Summary

The purpose of this research is to analyze the treatment of tempo in Uruguayan candombe drumming, and its relationship with dynamics. Tempo in candombe may vary from ca. 100 bpm (beats per minute) for a slow performance to around 150 bpm for very fast performances, with most characteristic tempos in the range of ca. 130 to 136 bpm. Different types of tempo fluctuations during the performance are very common and idiomatic for candombe drumming. A core concept in candombe performance is “*subir la llamada*”, an increase in perceived energy that involves both a raise in tempo and an associated increase in dynamics [2]. A computational tool was developed to plot tempo and loudness curves from the recordings in a dataset of 36 performances by renowned players.

Uruguayan Candombe drumming

Llamada de tambores

- drum ensemble (ca. 20 to 60 players)
- perform marching on the street
- three types of drum:
 - chico* – small, high pitch
 - repique* – medium size and pitch
 - piano* – large, low pitch
- small groups: at least one of each type



Rhythmic structure

- cyclic, timeline based rhythm
- 4-beat cycle, 16 pulses
- *madera*: timeline pattern
- *chico*: one-beat pattern, timekeeper
- *repique*: syncopation, improviser
- *piano*: one-cycle pattern, timeline



Tempo and dynamics

- tempo range from ca. 100 bpm (very slow) to 150 bpm (very fast)
- typical tempos between 120 and 136 bpm
- differences dependent on the style of each *barrio*: Ansina, Cuareim, Gaboto
- tempo variations during performance are very idiomatic
- broad correlation between tempo and dynamics
- *subir la llamada*: increase of energy in the rhythm, involving an increase in tempo and/or dynamics

References

- [1] Luis Jure and Martín Rocamora. Candombe Recordings Dataset. <http://www.eumus.edu.uy/candombe/datasets/ISMIR2015/>, 2015.
- [2] Luis Jure and Martín Rocamora. *Subir la llamada*: negotiating tempo and dynamics in uruguayan candombe drumming. In *Proceedings of the Eight International Workshop on Folk Music Analysis*, Thessaloniki, Greece, June 2018.

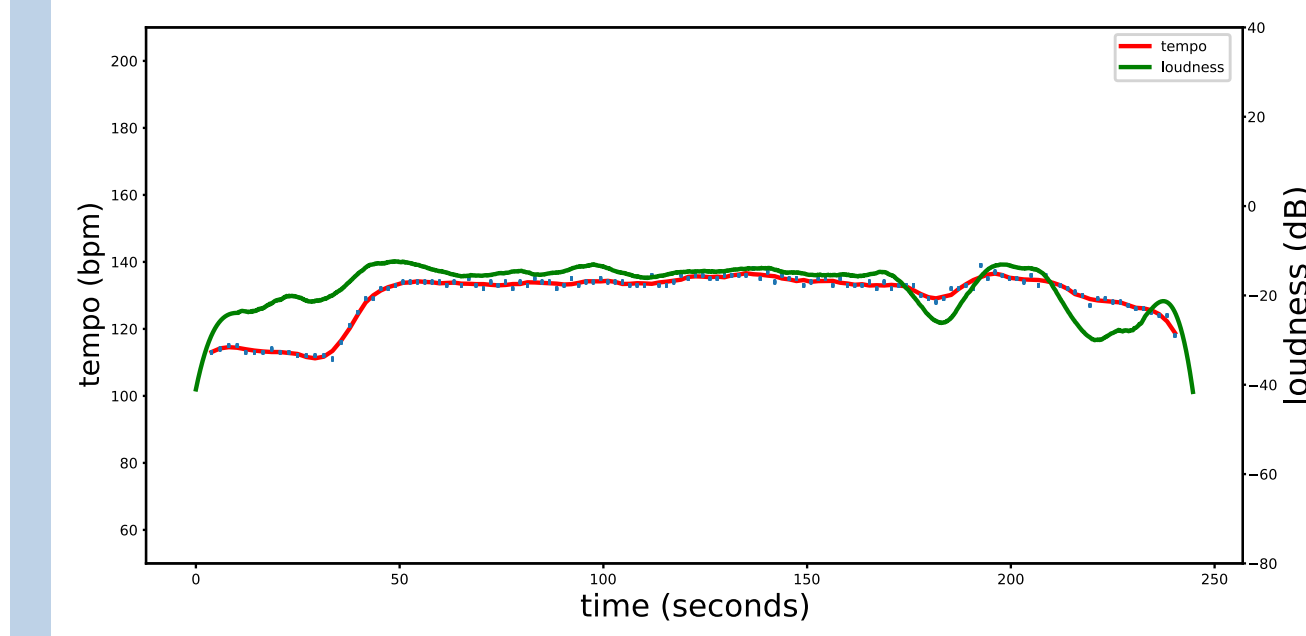
Dataset



- 36 recordings
- total duration: 150 min.
- groups of three to five drums
- 26 renowned performers
- different generations and styles
- annotated, beat and downbeat labels
- described and available at [1]

Methods and tools

A tool was developed to plot curves for tempo and loudness of each recording.



- written in Python, using matplotlib
- tempo curve estimated from beat and downbeat labels
- loudness computed on an A-weighted power spectrogram in the mel frequencies
- curves smoothed with a cubic Savitzky-Golay filter

Results

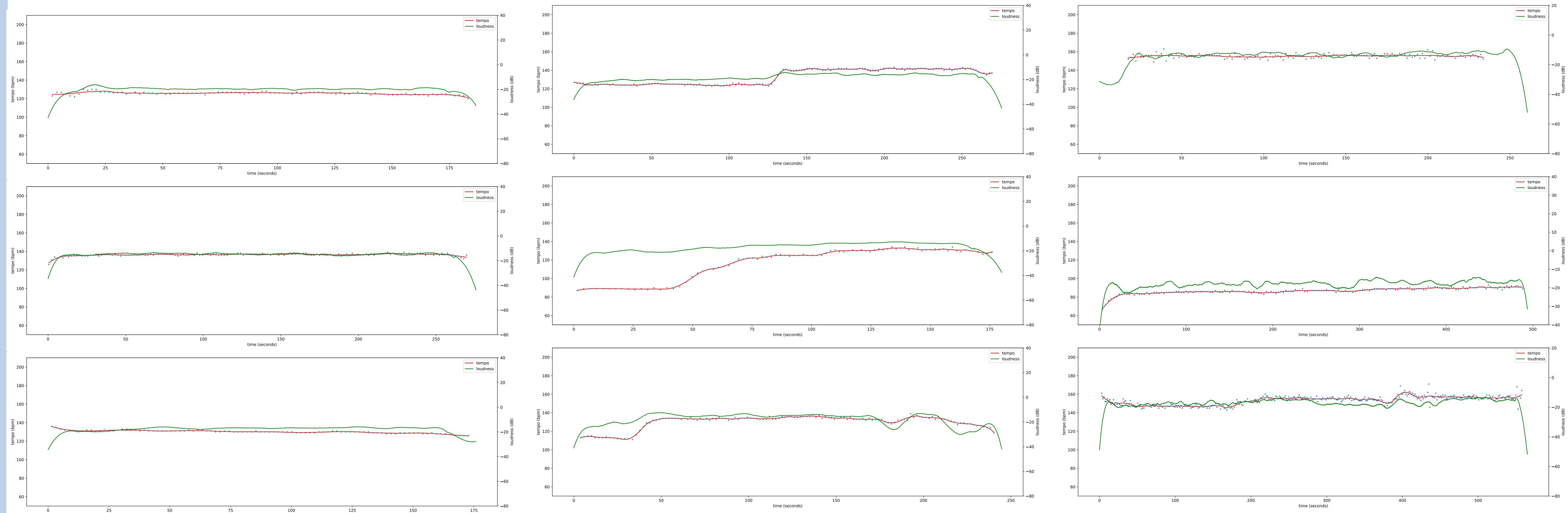


Figure: Analysis of performances of two groups of the style of *barrio* Ansina and one of *barrio* Cuareim (bottom), exhibiting a high degree of tempo and dynamics stability.

Figure: Analysis of performances of two groups of Cuareim and one of Ansina (bottom), exemplifying different cases of slower initial tempos followed by an accelerando, with various degrees of fluctuation in tempo and dynamics.

Figure: Tempo and intensity curves in two recordings of Ewe drumming (*Afa* and *Agbekor slow*) and one of Cuban rumba (bottom). The dB scale has been adapted to match the tempo curve.

Conclusions and discussion

- short performances beginning at “cruising speed” can exhibit a striking stability in tempo and dynamics
- performances beginning at a slower tempo usually speed up later on
- slow tempos are seldom maintained throughout the whole performance
- a more extended performance presented a high degree of variability in tempo and dynamics
- there is a broad correlation between tempo and dynamics in the performances
- the variability of tempo in candombe drumming evidences strong relationships leader-follower and high levels of entrainment in the ensemble
- this tempo variability was not found in recordings analyzed from other drumming traditions of the Afro-Atlantic culture (Ewe and Afro-Cuban)
- two distinctive particulars of candombe drumming may be related to this difference:
 - ▶ the absence of an explicit timeline played as an ostinato throughout the whole performance
 - ▶ the drums play alone and do not interact with singers

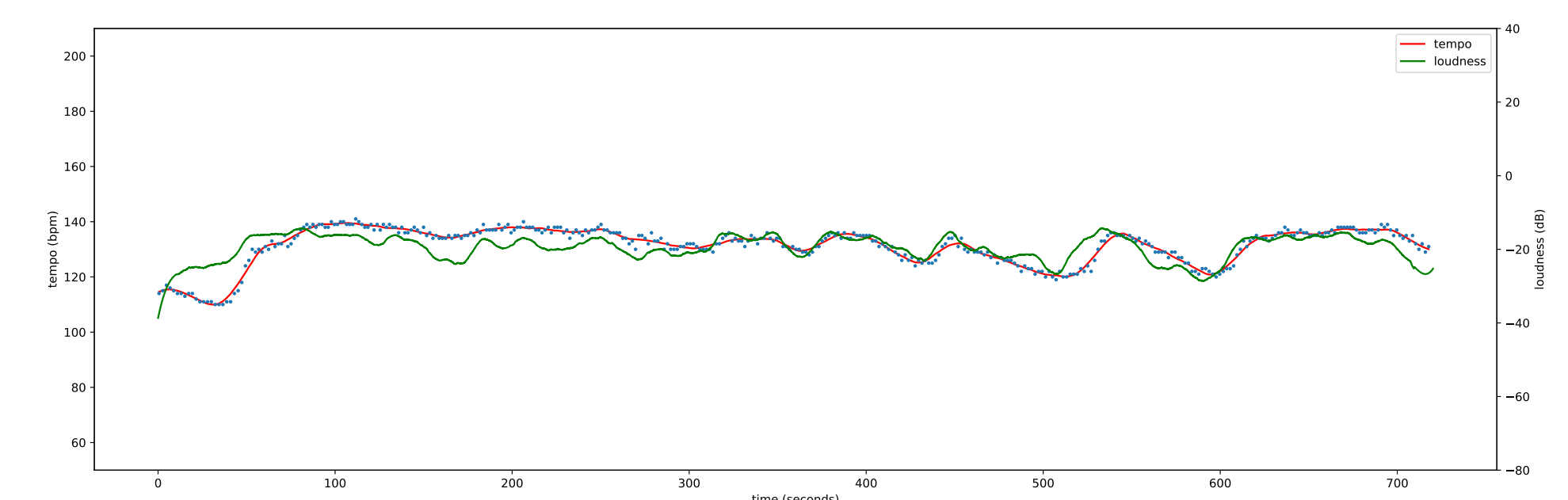


Figure: Analysis of an extended performance of a group of Ansina, with a high degree of fluctuation in tempo and dynamics. Observe the correlation between both curves.