

Creating a multilingual database to study speech rhythm

Marta Ortega-Llebaria
University of Pittsburgh

Motivation

Rhythm, which refers to the sensation of isochrony conveyed by repeating patterns in speech, is key to adding emotion and pragmatic meanings like irony to the dialogues of, for example, voice assistants such as Siri and Alexa. Despite its importance, few papers tested new promising rhythm measures due to the technical challenges involved in this type of research. The present project aims at ameliorating these challenges and promote research to test these new measures.

Project Description

- Build a multilingual speech database using TED talks in 8 different languages.
- Annotate speech samples with units used in rhythm measures.
- Generate rhythm measures based on:
 - 1 The repetition of duration intervals such as VarcoV, VarcoC (Dellwo, 2010)
 - 2 The repetition of pitch patterns such as Macro-Rhythm Frequency, and Macro-Rhythm Variation (Jun 2014)

Context

- To date, basic research on rhythm is based mainly on duration measures such as those in [1].
- Pitch-based measures like those in [2] have been tested only in 3 languages, e.g., English, Italian and Spanish (e.g., Polyanskaya et al. 2020).
- This database will facilitate exploring pitch-based measures in 8 languages expanding our understanding of rhythm cross-linguistically..

Creating a multilingual database to study speech rhythm.

Speech rhythm is key to the expression of emotion in dialogues, and pragmatic meanings like irony. Yet, technical issues make this research challenging. This multilingual database will ameliorate these challenges while promoting basic research on rhythm across languages.



Project Deliverables

Multilingual Speech database consisting of:

- 7 hours of speech
- 8 languages
- Orthographic transcripts
- Annotations at the level of sound, syllable, word, and Intonation Phrase
- Over 20 measures basic to the study of rhythm for each Intonation Phrase
- These measures will be based on both duration and pitch patterns.

Potential Impact

- This database provides to the linguistic community worldwide a tool to study rhythm across 8 different languages.
- It will promote research on rhythm using both duration-based measures, and pitch-based measures.
- This research has applications to speech technology and second language acquisition (e.g., Nagao et al 2022)

References

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