Integrating ETHNO-MUSIC and Tra-la-Lyrics for Composing Spanish Popular Songs

Maria Navarro[1] and **Hugo Gonçalo Oliveira[2]**

[1] BISITE Research Group, University of Salamanca, Spain. `maria90@usal.es`
[2] CISUC, Department of Informatics Engineering, University of Coimbra, Portugal. `hroliv@dei.uc.pt`

Overview

An automated composer of popular Spanish songs was developed by integrating ETHNO-MUSIC (Navarro-Cáceres, Olarte, and Cardoso (2018)), for generating melodies, and Tra-la-Lyrics (Gonçalo Oliveira (2015)), for producing lyrics. This confirms that it is not always necessary to develop new creative systems from scratch.

Spanish popular music differs from classical in aspects like sonority, sound disposition or rhythmic formulas used. It is always linked to a functionality and lyrics are essential for identifying the song's purpose.

Presented integration is analogous to having two different people composing a song: one creates the melody and another the lyrics. Unlike other systems that generate music for existing lyrics (e.g. Toivanen, Toivonen, and Valitutti (2013); Ackerman and Loker (2017)), in this case, melody is composed first,

ETHNO-MUSIC generates new melodies based on original Spanish popular songs, available in MIDI format. Musical excerpts were analyzed and their relevant features (pitch, duration, degree, first in bar, time signature, musical phrase) encoded and stored to be used as the training corpus for music. A Markov Model (MM), learned on the previous features, is then used for generating new compositions.

Once the melody is available, Tra-la-Lyrics 2.0, built on top of the poetry generation platform PoeTryMe, splits the melody into parts and generates lines of text for each part, while trying to maximize two main constraints: (i) one syllable per note; (ii) stressed syllables match strong beats of the melody. Generation is based on the Spanish adaptation of PoeTryMe (Gonçalo Oliveira et al. (2017)), though with an augmented semantic network, acquired from Concept-Net, and new line templates, acquired automatically from songs in Spanish.

Example

The MM was learned from 102 popular songs with time signature 3/4, 3-4 musical phrases with similar length, and similar sonority in the Frigian mode with possible modifications in its evolution to E minor.

Lyrics were produced for a set of melodies generated with ETHNO-MUSIC, with seed words that set two generation domains, common in Spanish popular songs: work

in the fields (*trabajo, siega, tierra, sembrar, semillas, trigo, cereales, campo, sol, paja, cosecha, cosechar*); and love (*amor, novia, moza, mozo, bella, belleza, feliz, alcoba, morena, guapa, sonrisa, ojos, bonito, bonita*). Figure 1 has an example of a song generated in the domain of love, with lyrics roughly translated to English. Most stressed syllables match strong beats and rhymes are frequent.

You look your appearance in the shape of vulgarity
because of a wonderful and irresistible disease
Your chin and face, my sweet love / somebody stole the key of my heart

Figure 1: Song with lyrics about 'amor' (love), including rough English translation.

A set of generated songs was evaluated by human judges. Overall results suggested that melodies transmit a feeling of Spanish popular music and both the rhythm and meaning of the lyrics is acceptable for a first approach.

References

Ackerman, M., and Loker, D. 2017. Algorithmic songwriting with ALYSIA. In *Proceedings of 6th International Conference on Computational Intelligence in Music, Sound, Art and Design*, EvoMUSART, 1–16.

Gonçalo Oliveira, H.; Hervás, R.; Díaz, A.; and Gervás, P. 2017. Multilingual extension and evaluation of a poetry generator. *Natural Language Engineering* 23(6):929–967.

Gonçalo Oliveira, H. 2015. Tra-la-lyrics 2.0: Automatic generation of song lyrics on a semantic domain. *Journal of Artificial General Intelligence* 6(1):87–110. Special Issue: Computational Creativity, Concept Invention, and General Intelligence.

Navarro-Cáceres, M.; Olarte, M.; and Cardoso, A. 2018. User-guided system to generate Spanish popular music. In *Proceedings of 9th International Symposium on Ambient Intelligence*. Springer Verlag.

Toivanen, J. M.; Toivonen, H.; and Valitutti, A. 2013. Automatical composition of lyrical songs. In *Proceedings of 4th International Conference on Computational Creativity*, ICCC 2013, 87–91. Sydney, Australia: The University of Sydney.