

# MELODIC PATTERN CROSS-OCCURRENCES BETWEEN GUITAR FALSETAS AND SINGING VOICE IN FLAMENCO MUSIC

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## 1. INTRODUCTION

Flamenco is a rich oral music tradition with strong improvisational character from the Southern Spanish province of Andalucía. Having evolved from a singing tradition (Gamboa, 2005), the singing voice, referred to as *cante*, remains the central element in the genre's current form, accompanied by guitar playing and rhythmical hand clapping. During a flamenco performance, accompanied singing sections alternate with instrumental interludes, in which guitarists often step out of their accompanying role and perform so-called *falsetas*. In Núñez & Gamboa (2007) the term *falseta* is described as “the interpretation of a small composition with autonomous musical identity”. By playing *falsetas*, guitarists contribute a piece of their own inspiration, either composed by themselves or re-interpreted from masters of the genre, to the performance as a whole. In this study, we focus on the mutual interaction between *falseta* and *cante* with respect to melodic content. We identify a large number of cases where a characteristic melodic pattern can be found in guitar *falsetas* as well as in the singing voice melody. These cross-occurrences are not limited to the same performance, but can span across decades and even genres. Based on a corpus of 50 such melodic cross-occurrences, we study their characteristics and computationally assess the melodic similarity of the detected examples. This study opens a new research line in computational ethnomusicology which can reveal novel aspects of the creation and evolution of flamenco music and furthermore gives rise to a number of technological challenges.

## 2. CORPUS STUDY OF MELODIC CROSS-OCCURRENCES

We gathered a representative corpus of 50 examples of melodic patterns encountered in commercial music recordings, which occur in both, a singing voice and a *falseta* melody. In 67% of the cases, the melodic fragment first occurred in a sung melody and has later found re-use in a *falseta*. In some cases, this recreation occurs either during the same performance in a call-response manner. In other cases, the *falseta* melody is taken from popular genres (i.e. *coplas* or *cuplés*) or related flamenco fusion genres, including the *rumba catalana*, flamenco rock and flamenco inspired pop music commonly referred to as “new flamenco”. In the remaining 33% of the examples, a melody which first occurred in a *falseta* has later been reinterpreted in the *cante*. In some cases, the respective melodic frag-

ment even takes on a fundamental structural role in a flamenco song. We furthermore discovered that both cases, re-use through the guitar and through the singing voice, show a tendency to take place in particular flamenco styles (specifically *bulerías* and *tangos*) and that certain guitarists show to be particularly involved in this process, most prominently *Paco de Lucía*.

## 3. QUANTITATIVE ASSESSMENT OF MELODIC SIMILARITY

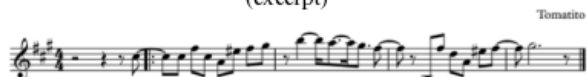
Given the expressive and improvisational nature of flamenco music, occurrences of the same melodic pattern will inevitably exhibit difference by means of melodic variation and ornamentation. In order to objectively assess the similarity between two instances of the same fragment, we apply a computational melodic similarity measure. We manually transcribe the guitar *falseta* (*a*) and the respective sung melody segment (*b*) to MIDI format. For a given pair *a* and *b* we compute the *earth mover's distance* (Typke et al., 2003)  $d_{a,b}$  and compute the ratio  $r = \frac{d_{a,rand}}{d_{a,b}}$  with respect to the average distance of *a* to 500 randomly melodic fragments extracted from the *Corpus COFLA* (Kroher et al., 2016).

## 4. CASE STUDIES

We conducted a number of case studies, where we analyse relevant examples of the research corpus in detail with respect to the context of origin and re-interpretation of the melodic material and the amount of variation among them. One example is a melodic pattern appearing in both *falseta* and *cante* of the song *Tangos de la Sultana* recorded by singer *Camaron* together with guitarist *Tomatito* (Figure 1) in 1979. Within the song, the pattern first occurs in the guitar before it is interpreted by the singer. It furthermore forms an essential part of the vocal melody, which is repeated throughout the song. A very similar pattern is encountered in a song of the same style titled *La que quiera madroños vaya a la sierra* recorded by singer *La Repompa* in 1958. A computational analysis shows that the computed similarity between the *falseta* and the vocal section in *Tangos de la Sultana* is nearly identical to the similarity computed between the *falseta* and the respective section in *La que quiera madroños vaya a la sierra*.

## Tangos de la Sultana

(excerpt)



**Figure 1:** Manual transcription of a melodic pattern from the song *Tangos de la Sultana* recorded by *Camaron* and *Paco de Lucía*.

### 5. ACKNOWLEDGEMENTS

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