CREATIVE HARMONISATION OF FOLK MELODIES

Costas Tsougras   **Maximos Kaliakatsos-Papakostas**   **Emilios Cambouropoulos**

School of Music Studies, Aristotle University of Thessaloniki

tsougras@mus.auth.gr   maximoskalpap@gmail.com   emilios@mus.auth.gr

1. INTRODUCTION

Since the 19th century, many composers attempted to blend local national musical elements (such as traditional rhythms, modal thematic materials) with aspects of established western musical idioms (such as classical tonality, post-tonal harmony, atonality); this way, novel musical styles were created that have a characteristic local flavor. This paper focuses on issues of creativity involved in the interaction between traditional folk melodies and diverse harmonic idioms. Traditional melodies often embody characteristics outside the 'standard' western major-minor framework, posing a challenge for a composer that wants to reconcile partially incompatible music systems. Can a creative computer system assist such a task? This study employs a system that harmonises folk melodies in diverse harmonic styles and presents some results regarding its usage. This system is a rather rare instance of the application of creative technologies in the domain of traditional music.

2. THE *CHAMELEON* HARMONISER

The CHAMELEON melodic harmonisation assistant has been developed in the context of the COINVENT project framework[1] and is capable of harmonising a given melody in different harmonic styles (Kaliakatsos-Papakostas et al., 2016), and also of blending different harmonic idioms (Kaliakatsos-Papakostas et al., 2017). The proposed melodic harmonisation assistant is adaptive (learns from data), general (can cope with any tonal or non-tonal harmonic idiom) and modular (learns different aspects of harmonic structure such as chord types, chord transitions, cadences and voice-leading). This harmonisation system can be used to generate novel harmonisations for diverse melodies via the exploration of the harmonic possibilities provided by the implied harmonies of input melodies.

Harmonic blending, as performed by CHAMELEON, involves two different processes. The first process is *melody-harmony* blending whereby a melody originating from a given musical idiom (with certain implied harmonic qualities) is harmonised based on a harmonic space (chord types, chord transitions, cadences, basic voice-leading) derived via machine learning from a different harmonic idiom. The second, is *harmony-harmony* blending whereby the harmonic space that is used to harmonise a given melody is, itself, the product of blending between two different harmonic idioms. In this paper we use both processes, whereby an annotated melody is presented to the system to be harmonised in different single or blended harmonic styles (from medieval to contemporary har-

monic styles). Several examples of creative harmonisations of different traditional melodies (Scottish, Greek, Russian, etc) have been produced (see Kaliakatsos-Papakostas et al., 2016 & 2017).

3. CREATIVITY & ACTIVE EVALUATION

A number of *passive* listening empirical studies have been conducted aiming to evaluate the creativity of CHAMELEON (Zacharakis et al., 2018). In the context of an *active* evaluation of the system, a compositional 'assignment' was given to seven composers or composition students in Thessaloniki (2 graduates of the School of Music Studies of the Aristotle University of Thessaloniki and 5 students enrolled in Costas Tsougras's "Stylistic Composition" course during the 2016 spring semester). The composers were provided with three different Greek folk melodies to choose from: "Είχα μιαν αγάπη" (*Eicha mian agapē*, "I had a love", in D Aeolian mode), "Απόψε τα μεσάνυχτα" (*Apopse ta mesanychta*, "Tonight at midnight", in A Aeolian mode) and "Μωρή κοντούλα λεμονιά" (*Mōrē kontoula lemonia*, "Oh short lemon tree", in D minor pentatonic mode). For each melody 40 different harmonisations were provided, created by CHAMELEON from 16 diverse harmonic idioms and their blendings ('BC' - Bach chorales, 'BTL' - Beatles, 'JA' - Jazz, 'CN' - Constantinidis, 'HM' - Hindemith, 'KP' - Kostka Payne, 'PL' - Palestrina Stabat Mater, 'FB' - Fauxbourdon, 'BN' - 'Bossa nova', 'CAN' - Chords added notes, 'GG' - Grieg, 'MDC' - modal chorales, 'PAC' - Parallel chromatic, 'POC' - polychords, 'WT' Whitacre major or minor, 'WT' - whole tone). The participants were asked to select the melody of their preference and the harmonisation/s that they considered more interesting/inspiring and compose a miniature for piano employing any compositional elaboration/variation techniques they deemed appropriate. The aim of the experiment was the creative use of the produced harmonisations as a structural harmonic framework for the building of rich musical textures and original compositional thought.

An excerpt from one of the seven short compositions, Lazaros Tsavdaridis's "Mōrē kontoula lemonia" is presented, in order to demonstrate the process. The song's harmonizations were produced from the annotated score of Fig. 1 (the annotation defines the mode, the phrasing and the harmonic rhythm). The composer chose a single CHAMELEON harmonisation, a blend between Jazz minor and Parallel Chromatic Harmony (see Fig. 2) and produced two piano variations, one simple and one more complex. In the first variation, presented in Fig. 3, he develops pianistic textures and voice-leading from the proposed harmony, choosing to deviate from it when necessary (e.g. in bars 15-16, to achieve a better cadence).

---

[1] http://coinvent.uni-osnabrueck.de/

Figure 1. Annotated first phrase of "Mōrē kontoula lemonia".

Figure 2. Harmonisation by CHAMELEON produced from the blending of the idioms 'JA minor' and 'PAC'.

Figure 3. Excerpt (1st variation) of composed piano miniature.

The seven composers created very diverse piano miniatures by applying different elaboration techniques on the selected harmonic backgrounds, by creating various types of textures and layers and by developing original forms that optimally accommodated their material (see and listen to all the pieces at CHAMELEON's website[1]). The seven miniature pieces were performed on 19 October 2016 by pianist Fani Karagianni during a live concert at the Museum of Contemporary Art in Thessaloniki.

Most composers reported that they found the whole project very stimulating and that they considered some of the harmonisations particularly inspiring; some stated that they would have never come up with one or more of the harmonisations they used. Overall, there was a positive response regarding at least some of the creative products of this system. More extended creative evaluation studies are expected to be conducted in future research.

So, CHAMELEON aids composers at one of the most important stages of composition, the choice of pitch material and the creation of the harmonic (structural) background, by providing an easily-controlled computational environment which very rapidly produces a multitude of diverse creative options, thus by broadening their choices at the minimum of time and effort. Of course, what defines the quality and originality of the musical result is ultimately each composer's personal touch and inventiveness, as the creative kick provided by CHAMELEON is only the first stage of evolution of the pieces' character, form and design, parameters between which the seven compositions differentiated substantially.

4. CONCLUSIONS

This study proposes a way to use creatively artefacts of music heritage, namely, folk melodies. Creative systems such as CHAMELEON may enhance users' appreciation for and engagement with traditional music, enabling them not only to access such music in digital repositories but also to re-use it creatively in novel compositions.

5. REFERENCES

Kaliakatsos-Papakostas M., Makris D., Tsougras C., Cambouropoulos E. (2016). Learning and creating novel harmonies in diverse musical idioms: An adaptive modular melodic harmonisation system. *Journal of Creative Music Systems,* 1(1).

Kaliakatsos-Papakostas, M., Queiroz, M., Tsougras, C., & Cambouropoulos, E. (2017). Conceptual blending of harmonic spaces for creating melodic harmonisation. *Journal of New Music Research,* 46(5), 305-328.

Zacharakis, A., Kaliakatsos-Papakostas, M., Tsougras, C., & Cambouropoulos, E. (2018). Musical Blending and Creativity: An Empirical Evaluation of the CHAMELEON Melodic Harmonisation Assistant. *Musicae Scientiae,* 22(1), 119-144.

---

[1] http://ccm.web.auth.gr/creativeusecomposers.html