

APPROACHES AND ASSESSMENT OF DRAMA PROSODIC TOOLS IN LIVE PERFORMANCE

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ABSTRACT

In this article we present an interactive toolkit, which we will refer to as “Drama prosodic tools” from now on, for the extended vocal and gestural performance of Attic tragic poetry in modern drama related to its prosodic aspects. “Drama prosodic tools” are based on prosodic elements (melodic, rhythmic) of the ancient text and are used: a) to detect various parameters of the actor’s voice, b) to track the movements and gestures of the performer, c) to combine the collected data of the above mentioned processes and d) to trigger interactive sound and speech processing during the performance.

In the first part, we focus on the development of modules for the phonological articulation of the ancient text based on archeomusicological readings (related to music and language) in order to add aesthetic values to the modern performance of ancient Greek drama.

In the second part of this paper we present an evaluation of “Drama prosodic tools” in two different experimental performances. In the first case, prosodic tools are used by an experienced actor in ancient drama who interprets the ancient text in a conventional way; in the second one, the tools are used by an expert musician in the interpretation of ancient Greek prosody. In this way we manage to test these tools in two different situations and control programming parameters and algorithms.

1. INTRODUCTION

In this project we present a modern approach to the phonological and metrical articulation of the ancient drama performance related to extended vocal techniques and interactive practices developed in contemporary music and theatrical approach [Salzman, 2008] in combination with theories developed since ancient times.

Voice interpretation in ancient drama could be examined in two ways: the phonological one (in ancient Greek) and the prosodic one [Allen, 1987]. Unlike phonetics, which describes all possible sounds of human languages, phonology examines the relationships between phthongs/phonemes within the system of a particular language in a given period.

In our case we focus on the examination of the prosody of the voice related to the melodic and rhythmic articulation, dynamic and timbre (spectral/sonic) deviation during *sprechgesang* (lyric recitation) as well to the gestural aspects.

a) In the theoretical part we rely on ancient theories [West, 1992] in order to add aesthetic values on interactivity and programming. These theories deal with the dynamics, the accents, the duration of the syllables, the transition between words and the activation – through motion – of the dialogues of the ancient text.

For example, we use the ancient Greek grammatical theory for long and short syllables of the Greek ancient text:

Ὡ ἴτε βάκχαι,
— — — — —
Τμώλου χρυσορόου χλιδᾷ
— — — — —

b) The engineering (technical) part has to do with the implementation of the detection of dynamics and pitch of the recited voice as well as capturing/tracking the actor’s gestures. A special

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camera is used that detects the movement of the actor and activates – via the computer – his dialogue with the chorus.

c) The aesthetical part is defined by the artistic interventions through interactive technology, the prosodic and archeomusicological approaches.

2. CONTEMPORARY PROSODIC AND VOCAL EXTENDED APPROACHES IN ANCIENT DRAMA

Since the beginning of the 20th century there has been a tendency to revive the ancient Greek drama in its natural place (the ancient Greek theaters); the emphasis of the performance has been put on metrics and rhythms of the text rather than the phonological and prosodic aspects of the voice. The first revival of the Delphic Festival was held at the ancient theater of Delphi in 1927 by Eva and Angelos Sikelianos and composer Konstantinos Psachos, the prosodic features of the ancient text have been based on the Byzantine and the Greek folk tradition [Sikelianos, 1993].

Both Iannis Xenakis and Janis Christou composed music for ancient drama, however, each dealt with prosodic intonation according to his own individual style.

Xenakis developed a prosodic synthesis technique which affects the instrumental style of his music. This technique is based on the long and short syllables, the accents and pronunciation of the dialect of Attica¹ [Solomos, 2007]. Therefore he claims the existence of a rudimentary polyphony in the performance of works in antiquity, which he attempts to recreate and is also inspired by both the ancient music theory and the harmony of Greek traditional folk songs. According to Xenakis' instructions, the pronunciation of words and syllables of the poetic text is not by recitation; therefore the text should be delivered without any emotion or expression, in a *recto tono* of voice, and without any variation in pitch or volume.

A similar approach can be found in the use of *protypa* (patterns), which is a structural feature in the composition of Janis Christou [Lucciano, 1987]. These repeated rhythmic patterns, which are the components of the composition, structurally correspond to the phrases of a text.

From past interactive performances of ancient drama (Bacchae, 1986) we will single out those of director Theodoros Terzopoulos, who has developed the *biodynamic method* [Decreus, 2016]. The concepts of ritual and physicality are very important for the director.

In the aesthetic approach of Terzopoulos, interactive audio systems are used for real-time processing through the actor's movement. His/her voice alters and controls the interactive system sound in real-time in order to add to the performance ritual and myth [Decreus, 2016].

We may also mention the work by composer Georgia Spyropoulos, *Les Bacchantes*, as an attempt to recreate the spirit of tragedy through vocal utterances, dance and interactive music interventions. The performer assumes all the roles and the voice simulates the sound which would have come through the mask worn by actors during the performances in antiquity [Spiropoulos, Georgaki, 2010].

Searching beyond the field of ancient tragedy with respect to the processing and manipulation of the human voice, which has some relevance to our own work as well, the most interesting tools that we have found are those that have been developed for *Extending Opera*. [Unander-Scharin Carl, Thesis, 2011]. Opera and multimedia productions are suitable areas to find similarities with the ancient drama and its presentation. These tools, however, deal with timbre, tonal and dynamic expansion of the sound of the voice and not the rhythm and melody, which are drawn from the original text/logos.

What is new in our approach - is that we develop and shape our tools based on interactivity and theories from ancient Greek music theory and language. In this way we add aesthetic values on the vocal interpretation of actors and reinforce the scenic and sound dramaturgy by recalling/reintroducing the phonological and prosodic rules of the ancient text. For example, we lead the recitation of the text to a specific scale/mode in order to help the actor (who is not necessarily a musician) with the use of those ancient Greek modes.

Our methodology is based on:

- a) Selecting the durations and accents of syllables of the original text in order to trigger rhythmic patterns which are based on rhythmic prosody,
- b) Directing the tone/pitch of the reciting voice according to the mode of an ancient scale and
- c) Activating/triggering of dialogues through the actor's gestures.

3. DESIGN OF EXTENDED "DRAMA PROSODIC TOOLS"

Two main interactive tools and functions are developed for the needs of this research: the *Aristoxenus Tool* and the *Ancient Dialogues Drama Tool*. The first is based on the dynamic and tone/pitch detection voice processing and the

¹ Xenakis creates a table with the *Pronunciation of the phonetic text* in which he correlates the articulation of ancient Greek letters with that of the Latin characters/letters having the closest pronunciation.

second on the detection of the performer's movement and gestures.

A) Aristoxenus Tool: With this tool – reference to the pitch curve theory of Aristoxenus – we aim to extend the ending syllables of the ancient text in order to create artificial continuity. This is achieved by "freezing" the last syllable related to the next. It can also be done in a tonal version by leading the "frozen" syllables into an ancient Greek mode.

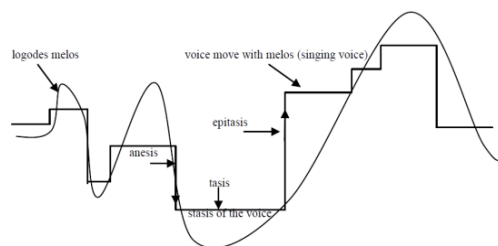


Figure 1. The pitch curve of the *logodes melos* by Aristoxenus, which represents the movement of the voice while singing and speaking.

According to the theory there is a continuous undulation of the voice, moving from one pitch to another. When the voice pitch drops, it is *anesis*, when it rises, it is *epitasis*, and when it is stabilized at a specific pitch, it is *tasis*. This tool identifies syllables, depending on their durations and accents via dynamic detection; we use the accents in order to trigger the freeze object. In this way we lead the sound - through programming - and direct it (going either up or down) to a particular mode/scale. Freeze creates an illusion of space, as what is perceived as space does not exist actually (sense of depth, space in time, virtual space).

By using the dynamic detection for recognizing syllables (while activating freeze) the tool lead the frozen syllables and produces a chord of 8 voices (chorusing) which are tuned to an ancient Greek mode. Thus, using the freezing technique and pitch direction the text is automatically set to music. Once again, the performer is free to use these tools according to his preferences.

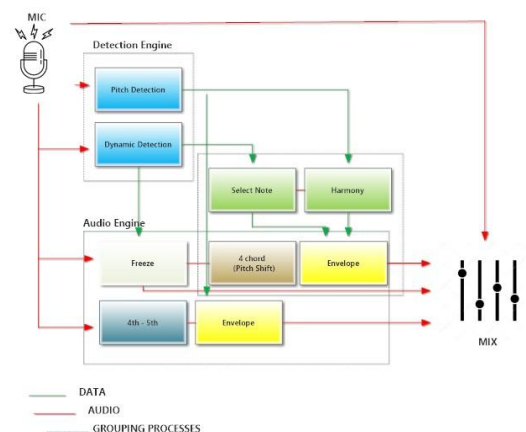


Figure 2. The general design of the first tool.

In this layout/diagram we see the following: four audio out signals that end up in a mixer and shape the final result. The edits in each of the signals are different aiming at different sound qualities and based on organizing different parameters. All processes rely on the incoming voice signal assays which activate the audio responses and determine the interactive methods of the performance. The microphone signal is input and undergoes three audio signal processings - the freeze, the four-string (*tetrachord* or *4chord*) and the 4th & 5th. The freeze processing produces the extension of syllables, the *tetrachord* embellishes based on the chosen mode and the 4th & 5th generate harmonious intervals and resonances.

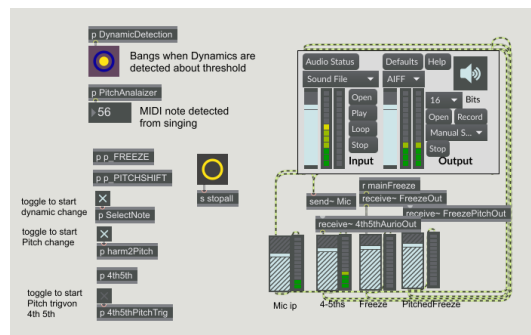


Figure 3. The main patch of the Aristoxenus Tool.

B) Ancient Dialogues Drama Tool

This system reproduces and activates dialogues and assists the performer to manage/direct/conduct the performance her/himself. In this way this tool makes a skeleton tracking data extraction via a camera sensor. The data format helps calculate the relative position of the body and its ends. A two-dimensional (2D) representation of the motion helps control the results, tests the conditions and transfers the data to the sound engine.

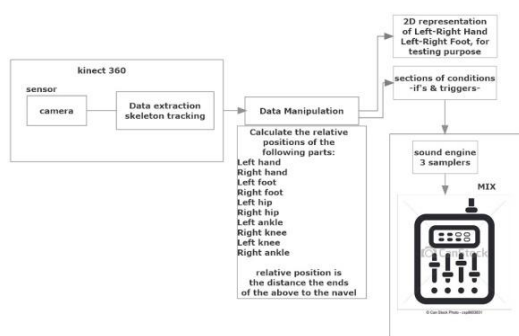


Figure 4. The general design of the second tool.

This tool gives the liberty of gesture to the performer in order to activate dialogues by the computer (in this case the Chorus). The Chorus in ancient drama is always present and represents the people, the judge, etc. This tool recreates the dialogue between the actor and the Chorus. By extracting data² from the performance of the actor (which include his gesture, expression and rhythm), a *skeleton tracking* is performed to track multiple points of the human body. Limb data (data ends) are used and particularly the movement of the performer's legs, which triggers a series of samples which are extracts of the Chorus' text. To achieve control, a 3D space/environment was also created where the movement of the actor is tracked. In this way, the actor sets the pace of the dialogue by playing his part and by triggering the response of the Chorus whenever he wants. With his/her motions, other sound parameters can easily be affected, such as the speed of the speech of the Chorus, the pitch, rhythmic accompaniment etc.

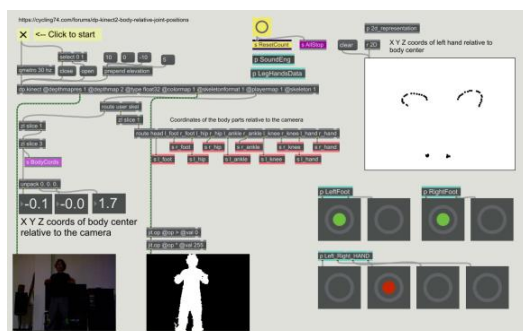


Figure 5. The main patch of the Ancient Dialogues Drama Tool.

These two tools can be used in different ways depending on the content and aesthetics of the text and gestural movements. We have tested the tools by two different categories of performers in order to understand the aesthetic variation between acting

² The data is extracted using the camera extension for the Max/MSP, *dbkinect* plug in.

and perception based on text alone, therefore we chose an actor and an expert in ancient Greek prosody recitation. Each of them pronounced the text in a different way. These tools were tested in real time as their real purpose is to interact in a live performance.

4. EVALUATION

The performance of those two individuals, allows as to evaluate the use and response of our Drama tools and compare the prosodic vocal performance to the hypocritical interpretation. Actually we have two case studies where their empirical comparison is their assessment criterion.

4.1. The actor's interpretation

The actor activated through her gestures the phrases of the text and created a "virtual dialogue". This enabled dialogues where she could influence various parameters in her live or pre-recorded text. The main accent was on the elements of the prosody and the creation of rhythmic and melodic sequences which is part of the interpretation. Pre-recorded syllables of the text with their accents, their durations and their tonal directions were recalled and transformed in real time by the performer in order to recreate a virtual prosody. Also, by turning her movement into percussion sounds, she rhythmically accompanied all the dialogues and individual elements. In this way she was able to run/direct/conduct a performance on her own in many ways.



Figure 6. The actor during the experimental testing of our tools and system.

4.2. The musician/prosodist approach

The second performer, musician and specialist in prosodic vocal performance, had restrictions on her gestural movement compared to the actor. This performer focused on the vocal performance in order to have the correct accent, and due to her musical background she supported the tonal and rhythmical parts of the text with great precision;

this fact has influenced the system response (through triggering) in a more fruitful way than the actor's behavior.

The musician perception of rhythm and musical accompaniment was superior to that of the actor's.



Figure 7. The expert in ancient Greek prosody recitation during the experimental testing of our tools and system.

4.3. Aesthetic values added by performers

In general, the impressions of both performers, obtained from this interactive experiment, were a very rich and unprecedented experience. They felt a great release in the expression of the emotions caused by the dramaturgy of these works. The fact that they could make virtual dialogues, create prosody phrases and virtual choruses was a release from the shackles of the predetermined instructions of the writer and the director. They succeeded in choreographing, directing and composing the sound landscape of the performance through the elements of prosody that we used to design our system parameters.

The improvisational and other practices recruited to test these systems were very different from the typical methods used so far to interpret ancient tragedy texts. The ability to shape the rhythm and the tone direction was very important for the dramatic process and the experiential approach of the performance.

Also, both performers enjoyed their interaction with Drama prosodic tools and explored the relationship between the interactive process and the theories in order to manipulate the parameters in real-time.

As regards the individual differences of these two interpretations, we could compare them through the audiovisual material.

The first point to have in mind, is that there is difficulty in approaching the correct recitation of the tragedy texts according to the prosodic rules. The performer should be educated about grammar, phonology and finally the pronunciation of these theatrical plays. The second point is that the performer may have to revise his image of previous interpretations of the same play. The third point is

that the performer should have the ability to use his voice and gesture manipulation correctly in his approach while rendering these texts on stage. And the fourth point is to get familiar and synchronized to the operation of the interactive tools and the space where he performs. These conditions are very difficult for a person to gather on his own.

Comparing the two performances, we could claim that in the first case it is evident that the hypocritical/dramaturgical approach is stronger than the second case where we have a more musical/prosodic approach. In the second case, that of the musician's approach, emphasis is given mostly to the prosodic rules of the text and the drama tools respond properly to that. The ideal approach should be the combination of both.

Finally, we must mention that these two cases cannot offer a conclusive assessment as they are based on the performance and results of an individual impression. This is because it is very difficult to make an objective evaluation of such a complex system and only the personal views and experience of the specialized users, can enlighten us about its operation.

5. CONCLUSIONS AND PRESPECTIVES

The extended Drama Prosodic tools offer a new aesthetic approach for interactive sound dramaturgy and reveal the prosodic characteristics of the ancient Greek text within a vocal and gestural performance of ancient Greek drama. By representing the state of dramaturgy and rituality of the tragic text through drama tools we could add aesthetic values and elements that reveal the musicality for the ancient text in the modern interpretation of the ancient drama.

The main function of Drama prosodic tools are:

- a) The detection of the actor's dynamic and rhythmic patterns of speech
- b) The creation of chorusing effect in real time.
- c) The control of prosodic dialogs (*Meliki/Melodic*) and vocal sounds during the live performance of the ancient drama through gestural detection.

The prospects of the Drama tools rely on the ability of the system to be adapted by those actors and performers who wish to investigate the prosodic rules of the ancient text, perform in both languages (modern and Ancient Greek), combine the gestures with the text and manipulate their voices real-time.

6. REFERENCES

- [1] Allen W. Sidney, *Prosody and Prosodies in Greek*, Blackwell Publishing LTD, 1966.
- [2] Allen W. Sidney, *Vox Graeca: A Guide to the Pronunciation of Classical Greek*, 1974, 1987 Cambridge University Press, 1968.
- [3] Aristoxenus, *Harmonika Stoicheia* (The Harmonics of Aristoxenus), Henry Stewart Macran, Georg Olms editions, 1990.
- [4] *Bacchae*, Directed by Theodoros Terzopoulos in Electro Theatre Stanislavsky in Moscow, ATTIS theatre, program, 2016.
<http://www.attistheatre.com>
- [5] Christou Jani, for his work *Patterns and Permutations* for orchestra. Notes - explanations to *Patterns and Permutations* (no date), 1960.
- [6] Decreus Freddy, *Η τελετουργία στο θέατρο του Θεόδωρου Τερζόπουλου*, Άγρα. [The ritual in the theater of Theodoros Terzopoulos, Agra], 2016.
- [7] Dodds E. R., *Euripides, Bacchae*, Clarendon Press, 1986.
- [8] Georgaki, P. Velianitis, *Aspects of musical structure and functionality of electroacoustic media in the performance of ancient Greek tragedy A composers' point of view* (P. Velianitis), in CIM08 Proceedings, Aristotle University of Thessaloniki, 2008.
- [9] Georgiades Thrasybulos, *Der Griechische Rhythmus – Music – Regen –Vers und Sprache* (Ch IV), Marion von Schroder Verlag, 1949.
- [10] Lucciano Anna-Martine, *Jani Christou: The works and temperament of a Greek composer*, Vivliosynergatiki, 1987.
- [11] Nasopoulou, *Musicality of Bacchae by Euripides Analysis of I. Xenakis's and Th. Antoniou's music composition for Bacchae*. MasterThesis, Conservatorium van Amsterdam Composition dpt, 2005.
- [12] Palmer Sikelianos Eva, *Upward Panic - The Autobiography of Eva Palmer-Sikelianos*, Edited By John P. Anton. Hardwood Academic Publishers, 1993.
- [13] Salzman Eric, *The New Music Theater: Seeing the Voice, Hearing the Body*, Oxford University Press, 2008.
- [14] Solomos Makis, *Iannis Xenakis, The universe of a singular creator*, Alexandria, 2008.
- [15] Spiropoulos G. – Georgaki A., *Virtual Masks in the Bacchae by Georgia Spiropoulos* ((IRCAM): Exploring Tragic Vocality in Max/MSP Environment, 2010.
- [16] Unander-Scharin Carl, *Extending Opera– Artist-led Explorations in Operatic Practice through Interactivity and Electronics*, Thesis, Stockholm University of The Arts, 2011.
- [17] West M. L., *Ancient Greek Music*, Clarendon Press, 1992.