MOBILE SOUND SOURCES IN TWO MUSIC THEATRE WORKS

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ABSTRACT
This article describes the use of different types of tools for the spatialisation of sound in the context of two music theatre projects. In the first part of the article the different types of sonic relationships explored in the projects are outlined, considering a global framework where the voices of performers, transformed sounds and mobile sources can effectively be integrated on stage. In the second part of the article the specific spatial design developed for the two projects is explained in detail, focussing on the advantages and limitations of synchronised and non-synchronised mobile sound sources. The role of mobile technology as a driving force for audience engagement and the interaction with performers in the creative process is discussed considering future developments of the project in the form of a wireless body-worn speaker system.

1. INTRODUCTION
The spatial possibilities of sound have fascinated instrumental and electronic music composers for a long time [1]. On the one hand, instrumental composers like Brant, Globokar and Musgrave have explored different types of spatial compositional approaches using voices and musical instruments considering the use of distance, positioning, projection as well as the movements of travelling performers in concerts [2, 3, 4]. On the other hand, electronic music since its early beginnings has been closely related to the development of sound spatialisation, but most of the time has been linked to the use of specific fixed setups with limited possibilities for the use of mobile sound sources, with a few recent exceptions [5, 6]. With some of these ideas in mind, the purpose of this study was to develop a flexible platform for the use of mobile sound sources in performance trying to integrate elements of instrumental and electroacoustic composition with elements of theatre performance. In the following sections different approaches for the use of spatial design in two music theatre projects will be described as well as an ongoing project based on the idea of developing a body-worn loudspeaker system that can be used in different kinds of performance environments.

2. SPATIAL SONIC RELATIONSHIPS IN PERFORMANCE
2.1. Contemporary trends in spatial design
As shown in a recent survey conducted by the author among electroacoustic music composers, the availability of affordable and powerful tools for spatial design in the last decade has changed the way composers conceive the role of space in the compositional process [7]. One of the interesting findings of the study was that many composers consider spatial design as an effective tool for developing dramatic and narrative relationships in a composition. Inspired by these findings and the idea by Barker [8] that sound can effectively be integrated with the actions and movements of performers on stage blurring the boundaries between actors and musicians, I started to develop various ideas for creating a flexible platform that could be used in different kinds of acoustic environments for music theatre projects.

2.2. Developing sonic relationships on stage
As a way of exploring different approaches to an active use of sound in music theatre projects a basic framework for the development of sonic relationships in performance was developed. Figure 1 shows a diagram with different types of relationships explored in the two music theatre projects described in this study. As shown in the diagram the main idea was to create a basic structure that would allow us to build relationships between natural, recorded, and transformed sounds in performance using spatial design as a main driving source. The first type of sonic relationship explored in the works was the direct connection between the performers’ voices and recorded vocal sounds. This relationship was explored at different levels in performance by using actively the sound systems available at venues in connection with the amplified and non-amplified voices of performers. The second type of sonic relationship examined in the piece was the relation between recorded voices and specific transformed sounds created from different types of voice samples recorded during rehearsals with actors. Transformed sounds were created using mostly a pitch tracker that captured the attacks and pitch changes of the voice recordings to create a range of tonal and percussive sounds linked to the character of the different sections of the piece. The very organic character of these generated sounds allowed the possibility of combining and
blending them with the original recordings adding intensity and contrast to specific parts of the works, and also to be used as raw sounds in the mobile sources as it will be described later.

Figure 1. Examples of sonic relationships explored in performance using spatial design as a common framework.

The third relationship investigated in the pieces was the one between the performers’ voices and the transformed sounds. The basis for this relation was established using mobile sound sources that the performers carried with them in different sections of the works as a way to relate specific choreographed movements with particular aspects of the composed music, as it will be explained in detail in the following section.

3. NON-SYNCHRONISED MOBILE SOURCES

3.1. Portable CD players as mobile sources

The first project developed using the framework shown above was a devised piece called *To have done with the judgement of Artaud* inspired by Artaud’s radio play *Pour en finir avec le jugement de dieu*. This project was created as a collaboration with musicians and dancers from the company *Base Theatre* and presented at the 2007 *Edinburgh Fringe* festival. The idea was to create a devised piece using a sonic framework that would allow an effective use of the spatial design by means of an original use of sonic mobility in connection to the choreographed movement of performers. As a way to do this CD players as portable radios playing parts of the composed music were carried by performers in different parts of the devised piece, in a similar way as done by the *Ghettoblaster Ensemble* in concerts [5]. In this case the use of portable radios as active props in the piece allowed the audience to think of the radio as an object linked to the nature of the radio play and also allowed the possibility of creating direct relationships between the performers’ movement and specific sounds on stage. Figure 2 shows the performers of *Base Theatre* carrying the portable radios while delivering speech in a section of the piece where a combination of speech and radiated sounds from the portable radios is actively used.

Figure 2. Performers of *Base Theatre* delivering speech and carrying portable CD players during a performance of *To have done with the judgment of Artaud* at the 2007 *Edinburgh Fringe* festival.

The driving idea for the development of the music and the spatial design for the piece was to incorporate as much as possible the use of natural and amplified sounds across the stage with the specific actions and movements of performers, as exemplified by Barker [8]. This was achieved through a process of intense workshops in which different types of approaches were tried, while the performers worked actively with the portable radios developing vocal and movement material to be included in the piece. Figure 3 shows an example of the spatial design in a section of the piece which combined the sounds of the portable radios, speech delivery by performers and amplified sounds played through the theatre’s sound system. As shown in the figure, the spatial design in the piece becomes an integral part of the work allowing performers to use sound to interact with the audience at different levels.
3.3. Audience engagement
One of the main motivations for the use of wireless technology in the project was to provide a higher degree of flexibility for performers allowing them the possibility of creating a direct relationship with the audience. The use of speech material in close connection with the spatialised sound of the portable radios and the theatre’s sound system proved to be an effective way of engaging audiences throughout performances, as one reviewer of the show at the 2007 Edinburgh Fringe Festival noted [10]:

“To have done with the judgement of Artaud is just as innovative, if not more so, in its use of sound to help create the appropriate atmosphere. At times the sound effects are so consuming, it is hard to distinguish their origins. Which sounds are the performers making? Which from the overhead speakers? What about those hand-held radios? At one point, the performers leave the stage. There is nothing, but the sudden, violent bursts of sound - behind the curtain, overhead, all around you. The next moment, one of them has moved so silently, you only now notice they're right beside you and have started muttering again.”

4. SYNCHRONISED MOBILE SOURCES
4.1. Portable wireless loudspeakers
Given the synchronisation limitations of CD players as mobile sound sources, the next step for the project was to try to implement a more flexible platform that would allow a genuine integration of the performers’ actions and specific musical developments in a theatre piece. The goal was to use a sound system that would not need to be synchronised manually by performers, but controlled and synchronised directly from a portable computer off stage. This would allow the possibility of controlling effectively the radiated sound of individual mobile sources in relation to the overall sound system and add an element of liveliness and interaction to the spatial design. For this purpose two pairs of portable Rimax wireless loudspeakers were used to develop material for a second music theatre work [9]. Figure 4 shows a pair of Rimax wireless loudspeakers with a transmitter used in the piece. The main advantages of these wireless speakers are that they can be controlled from a distance up to 100 metres, allow the possibility of transmitting in two independent channels to create a four-channel mix played through two pairs of speakers on stage and that their interesting shape allows them to work well as props in theatre or dance productions.

Figure 4. Rimax wireless loudspeakers used in the second music theatre project.

4.2. Interacting with performers
The second music theatre project was developed in collaboration with two performers which used wireless speakers to develop the basis for a dance theatre piece. Figure 5 shows one of the performers carrying a pair of wireless speakers during rehearsals.

Figure 5. Performer carrying a pair of Rimax wireless loudspeakers during rehearsals.
As it can be seen from the figures, the speakers are visually attractive, light and easy to carry for performers. During rehearsals it became clear that the fact that the performers could relate with the speakers directly as props and actively engage with the sounds that they produce in performance allowed a direct interaction between the composer controlling the sounds and the actions of the performers on stage. This interactive process proved to be a very effective way of engaging performers in the creation and development of the piece allowing a much more flexible and effective approach in performance compared to the use of non-synchronised sound sources like the portable radios.

As mentioned above, a flexible spatial design using synchronised mobile sources opens new possibilities to explore relationships between performers’ actions and the sound design on stage to create a flexible and adaptable theatrical framework. This could allow the performance space to be continuously re-defined during performance by performers by creating different types of sonic configuration relating the sound of their voices, the movements of the mobile loudspeakers and the sounds of the fixed overall four-channel PA system. The idea of motion can include the actual movement of performers on stage carrying the portable sources, as well as synchronised events on stage that will create an illusion of motion as proposed by Brant in his early experiments with travelling instrumentalists in the 60s and 70s [2].

5. FURTHER DEVELOPMENTS: THE RESONATING BODY

Further developments of the ideas described in this article will involve the use of wireless technology to create an audiovisual platform that will allow performers and audiences to have a greater role in performance. This will be done by developing a prototype of a body-worn loudspeaker system in close collaboration with the audiovisual company Green light AV. The prototype to be built will consist of three or four small and medium size wireless loudspeaker units attached to different parts of the bodies of performers as shown in Figure 6. Each of the units will be fed with individual sound signals which will be controlled as part of a larger scale multi-channel system environment similar to the one used in the two projects described above. This integrated system could allow the possibility of creating a flexible sonic platform for performance that would incorporate the gestures and movements of performers in the spatial design of a piece to create a truly immersive experience for audiences.

Figure 6. Example of the prototype of body-worn loudspeaker system to be used by each performer.

6. REFERENCES


