Mediality and Singing Performance:
New Approaches to Musical Interactivity and Performance

Pieter Coussen, Katty Kochman, and Marc Leman

I. Introduction and Background

This paper proposes an analysis and artistic implementation of a model of technological mediation for singing performance, including a critical discussion of issues affecting the usability of technological interaction in contemporary vocal performance. The researchers used this model to inform the development of a performance. Singing provides unique insight in the application of the ideas related to mediality and embodied cognition, as the body functions directly as the primary performance medium. Traditionally, it has been possible to alter the structural parameters of classical instruments to increase specific performance features. However, extensions of the vocal instrument by means of a transparent technological interface have generally not been feasible.

II. Aims

A transparent technological interface can function as an instrumental mediator, extending the performance capabilities of the singer. Gestural and emotional content may be enhanced in new and innovative manners and new methods of integrating the performing body in performance can be created. The use of technology can also allow the musical structure to evolve in ways not traditionally possible in singing performance, thereby creating a performance that is potentially more dynamic and interactive, as well as allowing the performer and the public to explore the artistic boundaries and gestural perception. The creation of new media and new media compositions allows for this exploration of novel performance capabilities. New methods in which pieces are composed, performed, and perceived are developed and informed through the paradigm of embodied music cognition. (Leman, 2008)

However, implementation challenges also exist with regards to the effective integration of the performing body with the technological mediator. External equipment or apparatus are often considered a negative value in singing performance. If possible the mediator should not function as an external instrument, but should rather function to augment the existing musical instrument of the singer. Therefore, an analysis of the structure of the tools is of critical importance in the development of multimedia tools for singers. Engaged singing performance requires an effective embodied mediation with dynamic interactions between the performer and the performance environment. This may be achieved through utilization of the paradigm of embodied music cognition. The concept of embodiment may be characterized by the structural coupling of the agent with its environment as well as the internal dynamics of the performing agent. (Kim and Seifert, 2007) Ideally, technological mediators would create an effective coupling between motor and sensory processes, allowing the action perception cycle and inner as well as outer processes of the performer to integrate (Leman, 2008) and for the generation of a cohesive embodied meaning. This may be achieved through sensitivity to the traditional performance parameters of the singer and a utilization of the multimedia tool to extend this natural range of action.

Another challenge in designing performance technologies arises due to attentional selection. Performance analysis indicates that switching between task sets is effortful in terms of cognitive resources, potentially distracting from the expressive intentions of the performer. When this occurs the technological mediator may produce a decrease in performance
expressivity due to ‘switch cost’. Switch cost may be reduced if individuals are given sufficient preparatory time to adapt to the cognitive processes involved in the novel task (Shulman and Corbetta, 2002). Therefore, practice time and intuitiveness of the mediator are important design considerations. The switch cost might also be reduced if the mediator primarily functions to extend the natural actions or capabilities of the musician, enhancing the existing tendencies of the performer. In this way, the mediator acts as an “augmented musical instrument”.

While these implementation challenges are not unique to singing, as structural alteration and enhancement of the singing instrument has not been historically commonplace (with the notable exception of castrati and to some extent amplification), they offer the singers and composers new opportunities for creative mediums, when implementation challenges can be effectively addressed.

III. Main Contribution
3.1 METHODOLOGY

This research study sought to collect preliminary data for the development of novel control parameters to extend the instrument of the singer, intuitively and without placing biomechanical constraints on the performance. An operatic piece (“Il dolce suono” from Lucia de Lammermoor by G. Donizetti) was selected and a structural analysis of professionally recorded pieces was conducted for identification of key biomechanical and musical parameters. Based on the data collected, a combination of several photocells was utilized by the singer to enhance the audiovisual dramatic features of the aria. The placement of the sensors was determined by an integrated approach including aspects of scenography, dramaturgy, and structural analysis of known performances and artistic interpretation of the authors. The interface, therefore, was embedded into the actual performance criteria and based on the typical hand gestures of the singer. Furthermore, the cues derived form the actual score and phrasing of the aria, are considered as valuable ‘sensor input’ and taken into account when mapping sensor data of the photocells to parameters exemplifying the different states of the performer.

3.2 RESULTS

Research was primarily based on systematic multistage prototyping. As a ‘Mad Scene’, the features added to the piece selected sought to enhance the idea being ‘out of mind’. In keeping with the idea of cohesive embodied meaning, the features added to the performance are based on the actions of the singer, but serve to extend the idea that she has been separated from her lucid state. Both sound parameters (such as reverb and delay) and visual representations (such as silhouette projections) serve to express the character’s increasing distance from sanity as the scene develops.

3.3 IMPLICATIONS

Performers may be reluctant to use technological mediators, as they may divert attention away from the dramatic goals of the piece. Therefore, an alternative strategy may be developed using technology as a facilitator in order to increase audience attention to an aesthetically important or unexpected dramatic event and/or to reinforce a pause in attentional awareness set for novel purpose. By assigning agency to the technological mediator, thereby ascribing dramatic importance to the tool, the tool serves a dramatic function, thereby, integrating effectively in the performance rather than detracting for the effectiveness of the audience performer interaction.

This issue is examined proactively by researchers in the development of the performance tool presented in this paper. Our design model should serve to facilitate the development of new media art, in a method that supports effective musical communication. The model
should serve to facilitate the manner in which artistic works are composed and performed. The implementation of these concepts occurs primarily through the design of the application, which extends the natural characteristics of vocal performance. According to Seifert and Kim (2008), “…mediality emphasizes the relevance of external representations and processes mediated by a ‘medium’, which not only serves as a passive means of conveying the message, information or intention, but also participates in [its] shaping” (p.178). In this environment, the media tool can function not only as a means of conveying a musical message, but may also influence the shaping of that message. The use of the agency and dynamic mapping strategies according to the needs or structure of the piece may allow the application to become more interactive, instead of being purely functionally based.

Keywords
Embodied Music Interaction, Music Mediation Technology, Music Performance, Music Communication

References


