Analysing Gesture in Audiovisual Performance

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ABSTRACT

This paper extends upon previous work (Pedersen, Burke & Alsop, 2020) examining gesture in audiovisual performance using motiongrams and spectrograms to identify aspects of gestural surrogacy. We focus on integrating the concept of gestural surrogacy from the spectromorphological tradition with concepts of multisensory feature binding. To support this investigation, we examine excerpts of two audiovisual pieces, comprised of improvised clarinet, guitar and post-processed video in contrasting styles.

INTRODUCTION

Visualisations of audio material are not unprecedented when analysing complex performances: Borgo (2005) uses fractal correlation as a means of examining the features of improvised musical performances by Evan Parker and others, while Jesenius (2010) and Francoise (2012) have developed systems for analysing physical gestures and sound together. In examining audiovisual performance, we use Jesenius’ AudioVisualAnalysis tool (Jesenius 2005) to extract aligned motiongrams and spectrograms from recorded performance footage, enabling us to compare the morphological qualities of both the audio and visual components, including the gestures of the performers themselves and the resulting audiovisual work itself. In effect, we are interested in looking at the ‘trace’ of each aspect of the performance.

By utilising analytical tools which draw directly on the qualities of both sound and motion, our goal is to examine abstraction and embodiment in visual music, drawing upon Dennis Smalley’s work on spectromorphology (Smalley 1986, 1997). Smalley identifies several levels of gestural surrogacy, in terms of degrees of abstraction away from both the source material the gestural archetype:

• primal gesture: basic proprioceptive gestural awareness, not linked to music making
• first order: recognisable audiovisual material subject to recognisable gestural play without instrumentalisation
• second order: traditional instrumental musical performance
• third order: where a gesture is inferred or imagined in the music, but both the source material and the specific gesture are uncertain
• remote: where “source and cause become unknown and unknowable as any human action behind the sound disappears”, but ... “some vestiges of gesture might still remain”, revealed by “those characteristics of effort and resistance perceived in the trajectory of gesture”.

ANALYSIS

Previously, we examined only the trace of the final artistic output: the video content and the audio content of the performance. For this analysis we also captured video of the performers themselves, in order to
compare motiongram features arising from the performers’ gestures with the features of the resulting audiovisual performance.

Two 30 second excerpts taken from two different audiovisual pieces by Burke and Alsop were analysed. Figures 1 and 2 show segments from the beginning and the middle of *Stoics and Epicureans*, a piece with improvised audio from both artists (clarinet and guitar, respectively) and visuals by Burke. Figures 3 and 4 show segments from the beginning and middle of *We’re Ready*, which again has improvised audio by both artists, but with visuals by Alsop. Burke’s approach to the visual element of the *Stoics and Epicureans* involved manually compositing additional visual elements over treated footage from the performance, introducing moments of audiovisual synchresis (Chion, 1994) through the manual editing process, while maintaining an overall aesthetic of visual counterpoint. Alsop’s approach focused on creating a visual aesthetic that was parametrically related to the audio of the performance.

Each figure consists of three separate motiongram analyses: raw footage of Burke’s performance, raw footage of Alsop’s performance, and the finished visual footage by the Burke in Figures 1 and 2, and Alsop in Figures 3 and 4. The common spectrogram is repeated with each motiongram layer for ease of examining the relationship between the audio and visual elements.

![Figure 1: Analysis of excerpt 1 from Stoics and Epicureans](image)

In the top two layers of Figure 1, we can see motiongrams of Burke and Alsop’s instrumental performance. Burke’s clarinet playing alternates between more expressive segments (e.g. the first 6 seconds) in which there is also a lot of upper body movement, and more intense, dense performance (e.g. the 6-12s segment) in which there is little upper body movement but significant finger movement. While the finger movement does not register in the motiongram, the density of the audio is evident in the spectrogram. Alsop’s guitar performance is based around sustained strumming throughout the piece, and this appears as a consistent band of movement in the motiongram. In the motiongram of the finished visual we can see some evidence of audiovisual synchresis, signified by the strong vertical lines representing visual cuts that align with events in the
spectrogram. Treated footage of the original performance is included in the finished visual material. Comparing the motiongrams of the individual performances, we can see this carried across in the motiongram of the finished work.

Figure 2: Analysis of excerpt 2 from Stoics and Epicureans

The second excerpt of this piece was selected from a segment that served as a visual counterpoint to the audio, featuring slow moving abstract visuals, with no use of the treated footage of the original performance. Comparing Figure 1 and Figure 2, the visual cuts are no longer present in the finished work, nor are the performance gestures evident. The abstract visuals appear in the motiongram as extended smears. This segment is noticeably different sonically, with sustained audio elements focused on the mid to low register around 2.6kHz and below, compared to Figure 1, which had a lot of activity around 7kHz.
Looking at Figures 3 and 4, we see the contrast in Alsop’s approach to the finished visuals. Once again, footage of the performance is used in the finished video work, but it is abstracted via a prismatic blurring effect, which is affected by the audio. Both performers are more physically expressive in this performance, as seen in their motiongrams in the top two layers. However, their physical gestures are obscured by the effect in the finished work, while their sonic gestures remain evident in the motiongram as vertical streaks which closely align with shifts in the spectrogram. This pattern is consistent across both excerpts. The tightness of the binding, suggests parametric mapping rather than manual or coincidental alignment, and in fact the linkage is more obvious in the motiongram than when watching the work.
CONCLUSION

By more clearly identifying those elements of the audiovisual performance which are tightly coupled to instrumental gestures, we are then able to begin looking more closely at those aspects which arise from third and fourth order gestural surrogacy. Alsop’s use of parametric mapping to control an abstraction of the original performance footage blurs the line between second and third order gestural surrogacy by keeping the mapping sufficiently subtle so that it is merely hinted at, and only becomes more stark under analysis. In contrast, Burke’s more painterly approach of compositing video elements inspired by and only sometimes directly aligned with audio elements takes parts of her work further into the territory of remote gestural surrogacy, particularly in the second excerpt where there are qualitative similarities between audio and video elements that are hard to define.

In looking at the traces from the performed audiovisual content compared to the gestures of the performers, we have been able to identify some features and patterns which point to the aesthetic choices made by the artists and gain insight into the role of gestural surrogacy in their finished audiovisual work. More investigation is needed to refine this approach and establish clearer guidelines for analysis, but the results so far are encouraging.
REFERENCES


