

COMBINING PERFORMERS WITH SOUNDTRACKS: SOME PERSONAL EXPERIENCES

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Abstract

The author describes his creative experiences over the past 45 years in combining live performers with fixed electroacoustic soundtracks, and discusses the problems inherent in such mixed works, as well as the compositional approaches that create new relationships between the performer and the pre-recorded material. The article concludes with advice on practical considerations that are typically involved in such works, for both the composer and performer, within an evolving technological and artistic context.

1. Introduction

I have been intrigued by the possibilities afforded by combining a live performer with an electroacoustic soundtrack ever since I became a composer as a graduate student in 1969. In fact, my first electroacoustic work, *Children* (1969), was a setting of poems by e. e. cummings for soprano and electronic tape. Since then, much has happened in the field of electroacoustic and computer music, particularly with regard to live performance practice (Emmerson, 2009), but the "mixed" combination of live performer(s) with some form of "fixed media" has often been met with strong prejudices. One bias comes from acousmatic music practitioners who tend to avoid mixed works, presumably because their basic concept of acousmatic sounds coming from unseen sources would seem to preclude the aesthetic viability of including a visible performer (even though the tension that could result might be theatrically suggestive). The more serious critique is that the fixed quality of a pre-recorded soundtrack (or "tape" in earlier years) precludes interactivity which seems to be valued above all else. This objection takes different forms, depending on whether it comes from the perspective of the performer (for instance, feeling "trapped" by the fixed timing imposed by the soundtrack), the composer (whose aesthetic goals may require more fluidity or "freedom," up to the point where the performed result may be completely different every time), or the audience listener. I once had a reviewer say she was "depressed" to

experience the setting of a love poem for a live performer and soundtrack; I wondered what her reaction would have been if I had stated that the performer (who clearly was intimately interacting with the soundtrack) was actually triggering those sounds, not just reacting to them? If the listener perceives an interaction between a performer and the musical accompaniment, does it really matter whether the latter is fixed or live?

2. Why Combine Live and Pre-Recorded?

Here I will only speak about my own preferences and from my own experiences, while acknowledging that other composers and performers will adopt different positions and practices. My strongest impetus for creating mixed works is that skilled live performers provide a level of musicality and impressive virtuosity that is entirely different from what is possible with electroacoustic means, and therefore their contribution can be regarded as complementary. By definition, electroacoustic music is created with sounds coming from loudspeakers (and therefore only re-embodied in those speakers), whereas the live performer's sounds are always correlated with observable and highly embodied physical gestures (the only exception being perhaps the organist hidden away in an organ loft). In fact, one of the biggest challenges in creating electroacoustic sounds is to establish a language in which gesture can be perceived. According to Trevor Wishart (1996), gesture is an imposed morphology that arises from a continuous input of energy, such as breath, voice, bowing, rubbing, etc., as distinct from an intrinsic morphology created by impact energy that releases the resonant properties of an object, as with percussion or plucked instruments. Listeners are familiar with that range of energy-gesture relationships in the acoustic world, and may feel confused at how to interpret an abstract world of sound created, for instance, by a synthesis and/or compositional algorithm.

Whatever the sonic repertoire, it is clear that the live performer provides not merely a visual focus for the audience, but can also act as a "persona" in their interaction with the soundtrack, with varying relationships I will discuss in the next section. This can lead to a sense of theatricality and drama, even though some performers, trained to perform only with musical skills, may be less comfortable taking on an acting role, whereas others may embrace it. However, since the performer inevitably draws visual focus, I tend to keep the accompanying soundtrack very strong and present, not ambient. My personal criterion is to create a soundtrack that is interesting to listen to on its own, yet leaves enough "space" for the live performer.

An interesting timbral dialogue can be established between the performer and the soundtracks, particularly if the sound sources used for the soundtrack are derived from the performer, or other related sounds. In the early days with electronic sound synthesis, it was very difficult to match the richness of the live performer's acoustic sound with the available electronic synthesis techniques (which were then not based on sampled sound from the acoustic world). Personally I found frequency modulation synthesis (FM) to be an improvement in this regard as it facilitated the creation of dynamically changing spectra similar to those in the instrumental world, even if they remained identifiably synthetic. My work *Aerial* (1979) for horn and four computer-synthesized soundtracks is arguably my best effort in that direction. However, during the same period, it was also possible to create a tape part based on the analog recordings of an instrument that were subsequently processed to accompany a live performer playing the same instrument, such as my *East Wind* (1981), for amplified recorder and four soundtracks, and *Nightwatch* (1982) for solo marimba and four soundtracks. The emergence of digitally sampled sound in the 1980s opened up much more sophisticated timbral control in the soundtrack which could easily match that of the live performer, and this combination is still one that I rely on. However, I have not departed from use of the fixed soundtrack in favour of live interaction; what was painfully true in the early days – the limited timbres that could be produced in real-time compared to the richness of studio mixes – still does not resolve the paradox that the more that we can do in real-time today (and it is indeed impressive), the more we can do with studio processing and multi-track mixing in terms of timbral complexity.

3. Some Possible Relationships between the Live Performer(s) and the Soundtrack

What was described in the previous paragraphs is central to creating a relationship between the live and pre-recorded that can be termed "timbral extension." For instance, I often use the digital process that I have developed for granular time-stretching (Truax, 1990, 1992, 1994) whereby a sampled sound is stretched in time, anywhere from a doubling or less of its duration to a seemingly unending extension, with no change of pitch. In fact, extending the duration of a sampled sound, albeit with an added texture, allows the listener (and performer) to focus on the spectral content of those sounds, with harmonics or inharmonics often becoming identifiable as pitches. In the resulting work, the live vocal or instrumental pitches and timbres extend and complement the similar sounds on the soundtrack that have been stretched

and perhaps resonated as well. Sometimes the source sounds are entirely different from the live component and the performer blends with the soundtracks, or at other times emerges as a foreground voice. For instance, my works *Dominion* (1991) for chamber ensemble and two digital soundtracks, and *Steam* (2001), for alto flute and two digital soundtracks, are based on environmental sounds heard and often stretched on the soundtrack. In the case of *Steam*, all of the pitches of the stretched Canadian steam whistles and compressed air horns on the soundtrack are complemented by the live part that consists of melodic variations of those pitches, complemented by the breathy sound of the alto flute that can be made to resemble the characteristic sound signals heard on the soundtrack (see Figure 1).

Steam
amplified alto flute and CD

Note: Accidentals apply only to the notes they precede

Barry Truax

Fig. 1. *Steam* (2001)

The approach I am describing leads towards a contemporary musical technique called spectralism, except that instead of basing the live instrumental score on the spectral analysis of a particular sound, the source sounds are actually heard on the soundtrack and when time-stretched and/or resonated, their spectra become the electroacoustic environment or soundscape within which the live performer is heard. Another technique that facilitates this approach, and the one I currently use the most, is convolution. In particular I am using it to create auto-convolutions of the source sound whereby the sound is convolved with itself, resulting in its most prominent spectral frequencies being augmented, the lower energy components (such as noise elements) being strongly attenuated, and the overall duration doubled. A byproduct of the technique is that

percussive attacks are smoothed out and blurred, rather like what happens in a highly reverberant space. In my recent work, *From The Unseen World* (2012), for piano and six soundtracks, the only source material is a series of piano arpeggios comprised of six pitches, heard in different registers. A single auto-convolution, complemented by multiple iterations of those auto-convolutions, results in a complex spectral texture of ethereal, floating harmonics swirling around the live piano part, with nearly all of the piano's percussive attacks removed. The solo live piano part (which I perform myself) attempts to blend with this continuous texture using various techniques, such as holding the damper pedal down throughout, using very fast iterated melodic and arpeggiated patterns and clusters using the same six pitches, plus a gentle stroking of the specific high piano strings at the beginning and end of the piece. For dramatic contrast, the other six pitches not included in the soundtrack are played as bell-like chords, as if to bring us back to the real world.

Another possible relationship between the live performer and accompanying soundtrack is the creation of what might be called the "figure in a landscape," or "soundscape" if you prefer, particularly when the soundtrack provides an enhanced sonic environment based on processed versions of the live vocal or instrumental sounds. In today's practice, the processing of the live sound could happen in real-time whereby short samples are recorded "on the fly," but as I have already remarked, my own preference is to design a more complex soundscape from those sounds in the studio beforehand. I have already mentioned analog examples of this approach in my early works *East Wind* and *Nightwatch*. Over the years I have been fortunate to have composed many works for specific, highly virtuosic performers (leading to the issue as to whether other performers can later step into the solo role). One such case is oboeist Lawrence Cherney for whom I have composed several pieces, *Tongues of Angels* (1988), and *Song of Songs* (1992) both

for oboe d'amore and English horn and soundtracks; and *Inside* (1995), for bass oboe and two digital soundtracks, taking advantage of the unusual instruments he plays. A second case is Randy Raine-Reusch, a specialist in improvisation on Asian musical instruments which he has collected and studied. The arrangement with him was that I would compose the soundtrack based on processed recordings of some of his many instruments, and he would improvisationally compose the live part, as in *Bamboo, Silk and Stone* (1994) and *The Way of the Spirit* (2005-2006); we are identified as co-composers of both pieces. The scores for Cherney are entirely written out, and those with Raine-Reusch entirely improvised, but in each case the live performer is pitted against the enhanced instrumental sounds on the soundtracks: the virtuoso meets an extended version of his own performed materials, thereby creating a situation where the two are integrated and mutually interactive.

Another relationship that I have frequently explored might be termed "text enhancement" where there is significant text material on the soundtrack with which an instrumental performer interacts. Examples are another work for Lawrence Cherney, *Beauty and the Beast* (1989), where the soloist acts as a kind of narrator while the story is told on computer graphic projections by Theo Goldberg, and a pair of works, *Wings of Fire* (1996), for female cellist and two soundtracks, and *Androgyne, Mon Amour* (1996-97), for male double bassist, two soundtracks and video accompaniment. The former is based on a poem by Joy Kirstin, and the latter on a set of poems by Tennessee Williams. Both pieces add a theatrical component based on the premise that the performer addresses the love poetry to her/his instrument as the lover. The text is often processed with resonators that simulate the open strings of the instruments involved so that the connection of text to instrument is supported. An advantage of composing for a specific virtuoso performer

who can be relied on to perform the work on many occasions and potentially develop an intimate relationship with it, is that a very tight and expressive relationship can develop with the fixed soundtracks. Such is the case with *Androgyne, Mon Amour*, composed for the American virtuoso bassist, Robert Black, where I was able to take advantage, not only of his theatrical expertise, but also his ability to memorize the work and perform it with a tight phrase by phrase interaction with the text, as seen in Figure 2. I am pleased to report that a younger Canadian performer, Peter Pavlovsky, has been able to take up the piece with the same intensity and accuracy, in the long tradition of new generations of performers being inspired by the virtuosity of their predecessors. Similarly, Iracema de Andrade has expertly performed and recorded *Wings of Fire*, which was originally recorded with Frances-Marie Uitti.

ANDROGYNE, MON AMOUR
for Robert Black

music by Barry Truax text by Tennessee Williams*

Fig. 2. *Androgyne, Mon Amour* (1996-97)

An equally tight relationship between text, soundtrack and performer can be found in the other work composed for Cherney, *Song of Songs* (1992), with computer graphic images by Theo Goldberg. In this case, time-stretching of the text and various environmental sounds (e.g. birdsong, cicadas, crickets and a monastery bell and monk singing) takes on symbolic significance. The sensual text of the Song of Solomon plays on an extended metaphor of the beauties of the lover being compared with the beauties of nature, and vice versa, with everything and everyone singing the praises of love. Slight stretching of the spoken text from the Old Testament, read by both Thecla Schiphorst and Norbert Ruebsaat with no changes of pronouns, renders the spoken pitch inflections into a song-like utterance, which is imitated and extended by the live oboe d'amore and English horn (see Figure 3). When the spoken text is given an extremely long stretch, it becomes closer to an environmental ambience, and when the rapid fluctuations of the sounds of the birds, cicadas and crickets are stretched and harmonized, they begin to approach the human time-scale, and these moments are synchronized with the live parts. This continual blurring of boundaries, between humans and nature, male and female, Christian and Jewish traditions, and even heterosexual and homosexual attraction, is a metaphor for love itself.

SONG OF SONGS

for Lawrence Cherney

I. MORNING

BARRY TRUAX

Oboe d'amore in A

Six bells and monk's song
Tape 0:00 etc. 0:34
Return, Return, O Shulamite,
Return that we may look upon thee.

* | over text indicates key words that establish tempo for the next segment.
Text under instrumental line is used to guide phrasing, etc.

Dancelike
Oboe 0:44 ritard
Re - turn re - turn O Shu - la - mite re - turn that we may look u - pon thee

Slower *A tempo*
u - pon thee 1:08 ritard (may look)

Slower, more expressively

Slow, deliberate
Oboe 1:28 1:43
Who is she that looketh forth as the morning,
Tape fair as the moon, clear as the sun,
and terrible as an army carrying banners. er ble

Slow, lyrical (*Ornamentation ad lib on notes falling on the beat*)
Oboe 2:08
Tape Look not upon me because I am black,
because the sun hath looked upon me. Look not u - pon me look not u - pon me be - cause I am black

Fig. 3. *Song of Songs* (1992)

When the performer is a vocalist, then a spectrally based approach is particularly useful in that their vocal pitches can be derived from, for instance, the resonated and stretched sounds on the soundtrack, giving them a pitch reference, as in my opera *Powers of Two* (1995-99), its derivatives *Twin Souls* (1997), *Thou and I* (2003), and *Orpheus Ascending* (2006), as well as my Alan Turing tribute work *Enigma* (2012). In most cases, I have found that a unique musical pitch mode emerges from the soundtrack, presumably related to the harmonics that have become prominent via processing. For instance, see a sample page from *Beyond* (1997), for baritone and tape, based on a section of *Powers of Two*, where the resonated E-flat and B-flat on the soundtrack provide a stabilizing drone and pitch reference (Figure 4).

BEYOND

for baritone and tape

Barry Truax

Baritone *fearful*, *mf* *I do not see,*

Tape *long exhale* *inhale*

0:00 0:13 0:21 0:32

Bari. *I cannot breathe. Nothing is there for my eyes to grasp, and I no*

Tape 0:45

Bari. *longer e-xist. no eye, I do not see, not I, I cannot breathe*

Tape 0:50

Bari. *a little faster* *It is strange to no longer live on the earth, to a-bandon one's habits,*

Tape 1:08

Fig. 4. *Beyond* (1997)

Prior to this spectrally based approach of relating performer and soundtrack, I used the same algorithmic processes to create the score for the live part as I did for the synthesized tape part, namely those based on the stochastic Poisson distribution of events within a designed tendency mask, as in *Nautilus* (1976) for percussion and tape, *Aerial* (1979) for horn and tape, and *Sonic Landscape No. 4* (1977) for organ and tape. In the case of *East Wind* and *Nightwatch* mentioned earlier, most of the live part was created algorithmically during a period when digital synthesis was unavailable to me; see an example page from *Nightwatch* starting at 5:20 (Figure 5). There are currently experiments to generate scores algorithmically in real-time (Eigenfeldt, 2014), but this approach will clearly be challenging for performers.

The more spectrally based works I've created since the 1980s may be understood as extending my compositional practice to the micro-level of the timbral domain in order to integrate the live with the pre-recorded elements.

Fig. 5. Excerpt of *Nightwatch* (1982), for solo marimba and soundtracks

4. Some Practical Considerations

After over 45 years of working with performers and soundtracks, it's not surprising that I've developed many preferences and habits for how to accomplish the best results. Despite the rapid advances of technology during this period, many of the inherent problems (and I would suggest, solutions) remain the same.

For instance, I always insist on the live performer(s) being miked, which allows the person at the mixing desk situated ideally in the middle of the concert hall to balance the levels interactively between the live and the

soundtrack. In addition, this setup allows the performer's sounds to be fed to the same loudspeakers as the soundtrack, thereby integrating and enhancing them spatially (usually only the front and side speakers, not the rear ones).

Many recent technological advances have involved spatialization, to the point where I now regard an 8-channel setup as a basic unit, ideally with added speakers, or other rings of 8 in other locations, such as in the vertical plane. The results produce a convincing three-dimensional sound field, particularly suited for soundscape composition which is a personal specialization. However, most performers contemplating performing an electroacoustic piece only have access to stereo playback, certainly for rehearsal, and sometimes for performance as well. Ideally both stereo and multi-channel versions of a soundtrack are made available by the composer, but in performance, even if multi-channel playback

is not available, second best is to double or triple the stereo speakers around the audience, controlled from a centrally placed mixing board. This configuration allows the composer or technical assistant at the mixing console to use classical stereo diffusion techniques by dynamically mixing the stereo soundtrack to various combinations of speakers to create the illusion of an enveloping sound space around the audience; that is, a soundtrack may be fixed on its support medium, but it can be performed dynamically and interactively to suit the acoustic space where it is heard. A single performer flanked by two speakers where a technician merely pushes the play button is far from ideal unless the basic concept is some kind of music theatre piece where speakers are treated as disembodied sound sources or "characters," for instance.

Synchronization of the live performer with the soundtrack poses a number of issues and concerns, particularly for the performer. The score can include ideal timing marks for key moments of synchronization, with a fair degree of freedom in between. At the beginning, performers always worry about “getting behind” the fixed soundtrack (and they do). They can use a stopwatch for security, but with greater familiarity with the soundtrack (often getting ahead of it for a time), they usually end up just treating the soundtrack as a dependable accompaniment, knowing aurally what’s coming next and even anticipating it. Still, I find it best to leave a bit of “flex” in the live score and the timing of the soundtrack. In some cases I even leave the exact rhythm to the performer, using only proportional notation or the like, as in the example from *Wings of Fire* (Figure 6). I seldom resort to bar lines, and never to time signatures, which only seem needed for conducted works such as my choral piece *Thou and I*. I find vocal works the hardest to predict in terms of timing, mainly because of the breathing time performers need. As already described, works for a dedicated soloist can afford to have a tighter synchronization, right down to the phrase level, but in general I only synchronize larger sections of a minute or two in length, with intermediate timings in the score to let the performer know where they should approximately be, before reaching a major structural point in the piece. Giving the performer extra material to repeat, for instance, or allowing them to omit some material at these junctures may also be reassuring (an example may be seen in Figure 5 in the third system).

3.

Slow, senza tempo legato, with pauses, ad lib between phrases, rubato

* Note ○ = medium long note (> 2"); ● = short note (< 1")

4:08 etc.

Repeat ad lib
gliss gliss

4:42 "Sapphire moon ... bone and body are beginnings" *f*

simile
IV gliss gliss

Slow harmonic gliss

5:00 "In the stillness ... quench our thirst. In the stillness ... quiet wells" 5:15

Slow, as before
f
Slow harmonic gliss

espressivo

6:00

ca. 5:45

as before
f
Harmonic gliss

Fig. 6. Excerpt of *Wings of Fire* (1996), for cello and soundtracks

Live performers may require foldback speakers either to hear themselves and/or the soundtrack better, particularly in a larger space. Most performers rehearse an electro-acoustic piece on headphones or small portable speakers, so the transition to a full-range audio system in a medium or large hall cannot be relied upon to be smooth, particularly for new works. When it (hopefully) comes to recording a mixed piece for demonstration or publication, I never use a live pickup recording. It cannot possibly be optimized for the balance between the live and the pre-recorded, and should only be used as simply a document of a given performance. As exciting as a live performance may be in an actual concert, a recording of it seldom reproduces the

same impression, not to mention making its shortcomings more apparent. Instead I arrange a recording in an actual recording studio, or where appropriate, a suitably reverberant space, particularly for vocal works. The performer needs to hear the soundtrack over headphones (sometimes they prefer to use just one ear for that), and then the mix is made later when all of the edited sections of the live part have been selected and arranged in the optimum synchronization. Unlike most audio engineers doing these mixes who treat the soundtrack as an ambient element, I tend to favour a strong level for the pre-recorded material in the final mix.

Given the obvious constraints of using pre-recorded material, as well as its advantages in terms of timbral control, precise spatialization, and overall structural tightness, many would still ask whether it might not be better to do it all live, particularly given the power of current audio technology for real-time processing. The choice is obviously personal and aesthetic, but from a practical point of view there are several obstacles and limitations to doing things live. First of all, the equipment has to work dependably in performance, and that usually means guided by the composer and/or technician. How many times does one hear, "Well, it worked fine in rehearsal"? If there is live processing going on, how is it going to be rehearsed by the performer – presumably, again, only with the composer's assistance. Secondly, there is a frustratingly short lifespan to most technology. Many live, interactive pieces that were once easy to perform cannot be reproduced today through obsolescence, either of the hardware, software or both. Only a very few works have been "transplanted" to current platforms after even 5 years, let alone a decade or two. The equivalent of an instrumentalist having to upgrade their instrument every few years, or exchange it for a new model, is quite unthinkable, and not in the best interests of the music. As a result, few live, interactive pieces stand the test of time and could be said to enter the repertoire. There is an inherent irony when the composer who celebrates the liveness and even non-repeatability of a new work has to make the decision about whether to record it for posterity or let it fade into memory if not oblivion. Fortunately, all of my live, mixed works can still be performed today. Fixed soundtracks also face format obsolescence because of the machines required to reproduce them, but so far, digital copying which generally introduces little or no degradation has been successful. True, older analog recordings on tape have sometimes deteriorated, but many such pieces have been adequately digitized.

5. Conclusion

There is no doubt that electroacoustic technology in general, and computer music systems in particular, have greatly extended musical thinking with respect to what can

be created and expressed. The situation where live instrumental and vocal performers are involved is similarly extended, even if only a minority of performers today regard themselves as specializing in mixed pieces. The norm, however, is that the performer just plays the score, and leaves matters of sound control to the technicians and the composer. A few courageous and dedicated (composer) performers seek to bring more of the process under their own control, and one hopes to see more of that with future generations. However, the venerable "mixed" tradition of combining live performance with fixed soundtracks may well continue to develop, even if more attention is given to doing everything live and interactively. No matter what path is chosen, what is important really isn't the technology that's involved, but the artistic content of the work. Newer, more experimental technology often takes over the creative process by requiring a lot of time to get everything to work. The musical refinement that comes from dedicated performers living with pieces for years and perfecting them, and composers honing their means of expression and simply having something to say, is still as elusive as ever, but ultimately it is the most satisfying goal.

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