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# Pragmatic Considerations in Mixed Music: a Case Study of *La Rage*

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## Abstract

*With access to powerful real-time DSP languages now easier than ever, the new generation of mixed music composers are able to manage both sides of the coin: they have the programming skills and the compositional concerns that were traditionally the responsibility of two different persons. This brings more and more sophisticated integration of technical resources and compositional gestures. A good example of such integration is the author's piece La Rage. In the light of general comments on the seamless integration of technology in this piece, the author, by discussing how compositional and technical concerns interact in his process of creation, tries to pinpoint key considerations that help him achieve this. He proposes two major categories, portability and adaptability, and explains how they were addressed in this specific work.*

## 1 Introduction

Technology is now everywhere; so much so that it is no longer a feature, but an extension of everything, from bread making to music composition, from general public advertising to personal communications. In computer music, I therefore hope that we shall soon reassess where it stands: as a tool, a means to an end.

One great step toward this reassessment is the fact that music students are introduced to computer composition at an increasingly early stage; moreover, most higher education courses now include an introduction to DSP. In consequence, most of the new generation of composers have the programmer's skills to a certain degree, as opposed to the exceptional few that historically had access to high-end research centres. For those of us who are interested in the live integration of acoustic sources and electronic sounds, this means that we no longer have to rely on a musical assistant to program our ideas; we can subvert our algorithms to mould our artistic goal as we compose. I would compare this change of procedure to the mature use of orchestration by Berlioz and Ravel, who were using it no longer as a decorative feature, but as an intrinsic part of the compositional gesture. But such a rich universe of possibilities for the composer comes with its own set of

questions, responsibilities and challenges. The most important for me is the seamless integration of the different musical parts, both vertically (timbre domain) and horizontally (gesture domain). Since this was the main concern of this project, I was pleased that the overall comment after the performances was about the seamless usage of technology at the service of the work's poetry. Using this project as a case study, I will attempt in this paper to pinpoint how pragmatic programming concerns and poetic aims interact and enrich each other in the compositional process.

## 2 A Case Study: *La Rage*

When I started to compose *La Rage* for my Ph.D. in electroacoustic composition at the university of Birmingham (UK), it was by far the most ambitious work I had ever done, both in terms of its length and its aim of using the technology to serve a poetic intention. It is a musical setting of my favourite novel by Québécois author Louis Hamelin entitled *La rage* (1989). The novel features a young, intellectual dropout who retreats progressively into a destructive state of wrath. The story is punctuated with illusive hopes, series of increasingly misanthropic observations, and rage that starts as a muted sentiment to swell up like an abscess that can only explode.

When the time came to begin the project, I reread the novel a few times over, first as a reader, then to analyse it and single out the defining moments. I did not wish to systematically reproduce the programme, but wanted to translate into music the character's state of mind. To do so, I had to define my esthetic process as a reader of the novel and transpose it to music.

Choosing such a narrative model brought a form that was rich in contrast, with a development over a substantial period of time. I first intended the piece to be half-an-hour long, and the final rendering is between forty-five and fifty minutes long. I therefore needed something to help the listener follow the narrative plot and identify with the protagonist in his awkward relationships with the rest of the world. I decided that a free-jazz drummer, opposed to an eight-channel electronic part, was a combination rich

enough to sustain the interest, and powerful enough to create the intended poetic effect.

When producing a work of that scale, the composer can easily fall into the trap of doing too much... as I gracefully did! Its thirty different sections represented an alarming number of potential problems, so a solid pre-production discipline was needed to avoid most of them. Before any such ambitious undertaking, a number of decisions must be made and then followed through to the end. As with the choice of the instrument, I had to determine which setup would offer the most possibilities at the lowest technical cost without compromising the music. I propose to classify the pragmatic technical concerns that arose during this process under two categories: portability and adaptability.

### 3 Portability Concerns

Portability could be defined as a quality by which a piece is not bound to a specific performer, venue or technical setup. The reasons why one would work toward portability are straightforward: (1) the piece needs to be rehearsed, often not in the concert venue where it will ultimately be performed, and (2) it would be preferable if the piece could be played more than once, in more than one place, moreover that one performer could be tempted to tour with it.

In *La Rage*, a first step toward simplification was the elimination of sound reinforcement for the drum part. The intimate subject of the music calls for a chamber music setting, and the drums are unquestionably capable of filling a room of such dimensions on their own. Furthermore, not amplifying the instrument lets the sounds fully unfold, as no sound reinforcement can rival its acoustic source. In this manner, there is also a greater dichotomy between the instrument and the electronics than if both were to come out of the same speakers; hence, once again, this decision serves my poetic argument. And by eliminating the sound reinforcement, we also eliminate the need for a sound engineer who knows the piece throughout.

To exaggerate this dichotomy, I wanted to create a distance between the fixed source – the drums – and the room space, at its best in a multi-channel diffusion so dear to the electroacoustic tradition. Again for reasons of portability and efficiency, I wanted to avoid adding to the score a sound projection part to be performed by a technical assistant, but wanted to make full use of the room. To me, there was only one logical solution: multi-channel composition. I opted for eight channels configured *à la française* in stereophonic pairs because they best served my purpose. This quite standard setup was as follows: a front-narrow pair, behind the drums, in symbiosis with the acoustic source; a front-wide pair, to draw out the tape; a rear-wide pair, for lateral effects, since most of the audience will not be in the central listening sweet-spot; and finally, a rear-narrow pair, to counterbalance with the frontal source (Figure 1). Another great portability advantage in using four

stereo pairs in the composition process is that, in the very frequently non-ideal world of touring, when eight matched loudspeakers are not easily available, there would be the simpler alternative to find four matched pairs.

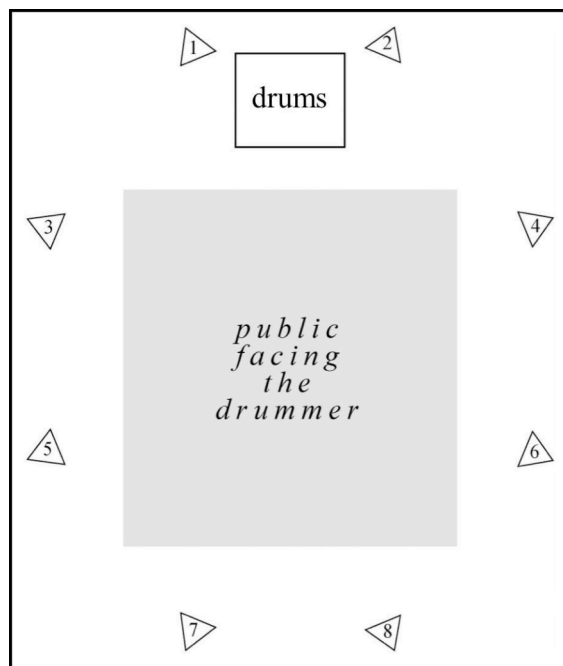


Figure 1. *La Rage* stage plot

Another example of technical compromise for the sake of portability, which like sound reinforcement does not result in major artistic concessions, resides in the choice and planning of audio inputs to the computer. Since most components of the drum kit are processed individually at some point during the piece, six microphones were used as follows: bass drum, snare drum, high tom, floor tom, hi-hat and ride. A seventh audio input is the cue trigger, which I decided to put in the audio realm for set up simplification, avoiding control-rate sensors like MIDI drum pads etc. Doing so has another great advantage: by using a piezo capsule on a soft foam piece, and by adjusting the threshold properly, silent triggering is possible, which is not obvious with the typical hard plastic electronic drum pads. Since most audio interfaces that have the required eight audio outputs also have eight audio inputs, I decided to restrain my input count to eight. This decision, for the sake of portability, brings a problem for a strolling movement in the piece, where microphones are needed in two remote places, namely behind loudspeakers 3 and 5 in Figure 1. The use of a passive audio input merger for these two special effects microphones is a minor compromise, especially because they are never used at the same time, and is a great solution to the potential problem of finding a nine input audio interface.

The greatest step toward portability in this early twenty-first century is the exponential development of the computing-power of portable computers. But even with

increasing computational power available, I still keep in mind the KISS rule that was forged by my early years of Max programming. KISS is the famous acronym for the humorous phrase ‘Keep it Straight and Simple’. Perhaps this idea can be more graciously expressed as the search for an elegant solution that is both simple and efficient. For example, why do live what can be done in a studio? Each real-time component takes ten times longer to create than its fixed counterpart. In regards of simplicity, I decided to find out what the interactivity bottleneck was and to concentrate on this part only. For me, sound processing is merely a compositional technique: it is a means, rather than an end, of rendering the electronic part of mixed music more fluid, of intensifying the gesture, once again at the service of the music and its poetic argument.

The KISS mantra was a continuous source of inspiration when selecting compositional techniques during the creative process. For example, during one movement, where a blurred polyphonic bass part contrasts with a high-pitched part triggered by the snare drum, why should it be synthesised in real-time? This would take processing resources unnecessarily, moreover psychoacoustics explain that the ear can only discern a certain number of simultaneous events. It is sufficient to create one multi-channel mix of a single high pitched hit and a muddle of bass attacks, and then to ask the computer to simply play back the buffered sound object on each snare drum attack. This example shows that the musical idea is clearly defined, that its important gestures are identified, and that the rest is subservient. All of this is done in the interest of economy and simplicity, especially in a piece that incorporates improvisation, thereby necessitating a degree of performance flexibility. A musical gesture is defined, its elements isolated and their technical rendering optimised. Because the computer does not work at its maximal capacity and the sound-processing setup is simple, stable and easily understandable, the performer may more comfortably play with its various parameters and limits. In consequence, the listener is presented the best music possible.

## 4 Adaptability Concerns

Now that the music is made portable, we need to make it work everywhere. Adaptation to a performer’s vision of the score, but also to his actual performance in a specific venue is often a missing feature of mixed music setups. Most performers of mixed music in my surroundings, including myself, will agree with Esler’s statement (2004, p 631):

“I am a percussionist that performs regularly with technology. I often find this a frustrating process, because technology has many limitations when combined with music. A tape has no means of knowing the intentions of a performer, as usually neither does a live electronic interface. This is quite a restraining way to perform. Computers are not humans and seldom are their tools within live electro-acoustic environments

that allow adjustments for interpretation, the acoustic of a hall and even account for flexibility in tempo, dynamics, and timbre.”

“When learning an electro-acoustic piece, performers need this type of freedom. It would be satisfying to play Saariaho’s *Six Japanese Gardens* with the ability to augment certain sounds in the audio files to better match the percussion instruments chosen, or for a clarinetist to be able to push and pull certain sections of Smalley’s *Clarinet Threads* to account for the reverberation of the hall and the quality of the speakers.”

Adaptability is therefore a concern to avoid the performer’s frustration in front of a system that is rigid and unresponsive to what Esler calls performance variability.

In *La Rage*, this problem was multiplied by several factors. For instance, drums are very variable in the timbral dimension: a snare drum can have a wooden shell of 14” x 6”, or a metal one of 12” x 4.5, skins can be tuned high or low. Cymbals are even more variable: most drummers own more of them than they actually choose to perform with on a specific gig, according to their inspiration of the moment.

One might think that this timbral variability brings another good reason for real-time processing, allowing variable timbres to blend in a specific performance setup. But again, with the KISS motto in mind, I tend to process as little as needed by the gesture to make it as fluent, adaptative and transparent as possible for the performer, and as light and elegant as possible for the computer. In other words, both the human and electronic performers are more comfortable.

Another moment where adaptability is needed is when improvisation parts are included in a piece. In *La Rage*, all sections rely on a certain degree of freedom given to the performer. Therefore, a rough score following algorithm is what I used most of the time, analysing a musical idea into its key components in order to make its performance gesture more fluid.

A convincing example of this is the opening phrase of the piece: three snare drum strokes involving counterpoint from the real-time processing, making a crescendo between the second and third stroke (Figure 2).



Figure 2. *La Rage*, excerpt of 1<sup>st</sup> movement’s Score (Tremblay 2005)

Since the tempo is determined, it would be tempting to use a fixed tape part. But this triggers a lot of problems: firstly, the timbre of snare drums varies significantly from

one to another, to the extent that it is difficult to create an impression of continuity between the snare and its electronic crescendo. Therefore, the live snare drum signal had to be picked up. Secondly, for the length of time of the crescendo, it is tempting to impose a fixed lapse of time with the help of a metronome. But since the number of attacks already had to be counted to trigger the following movement, it was simpler to measure the time between the two attacks, then deduce the tempo and the necessary time before the third attack, so that the performer is free to interpret this phrase as he wishes.

This, however, raises another problem: should the envelope attain its peak before the third attack, it would most likely stop the sound processing at the moment of the so-called attack that it would have calculated; this would leave a very uncomfortable silence if the drummer was behind. The third snare drum attack must shut off everything: the lights, the music, and the artificial upholding of the crescendo. The solution was to divide the processing envelope in two: the length of the crescendo is calculated as a function of the deduced tempo, but the sound processing stays at full blast until the attack that opens the following section is played.

In this way, the entire piece was cut out into triggering and interrupting gestures, called main cues, and interaction gestures, called secondary cues. All are marked on the score to allow the performer to understand the setup, its limits and its constraints. Just as a duet rehearsing a piece together must understand both parts to create a coherent ensemble, the drummer has to master the electronics in order to make the music happen.

If the performer must memorize his part and his impact on the setup, while letting himself be free with his interpretation of the more or less written or improvised sections, it is another reason to make the technical part as simple as possible.

But the piece is also adaptative in all its volume levels and trigger thresholds. Each movement, which consists of a sub-routine, has a list of specific volumes to set; often even tape parts are divided in sub-mixes to allow a better adaptation to a performer's vision of the piece. The score is provided with a list of those performance variables, and for each of them an intention is given. For instance, in the movement with a muddy bass part presented earlier, there are two thresholds and two volumes to set. Figure 3a shows the technical indication given, while Figure 3b shows the related score indications:

tp1\_vol : it should blend with the snare hits  
 tp2\_vol : it should fill the space under tp1  
 proc\_vol: it should expand the space  
 sn\_thresh: adjust to a comfortable *mf* threshold  
 tr\_thresh: adjust to avoid false movement transition

Figure 3a. *La Rage*, excerpt of 4th movement's Parameter List and Mixing Intentions (Tremblay 2005)

- at first, play only the snare on a chaotic rhythm pattern and explore the triggered tape part; be rhythmically inspired by the bass part of the tape (mimic a bouncing pinball), and never let the tape come to an end.
- play more and more frequently, allowing yourself to progressively play on the whole kit. [...]

Figure 3b. *La Rage*, excerpt of 4<sup>th</sup> movement's Score (Tremblay 2005)

Such great control deferred to the performer multiplies the adaptability factor of the piece, but all thirty movements being explicitly customisable means a longer setup time in the actual venue. But I believe this trade off pays back with an enhanced performing and listening experience. Because, as Esler (2004, p.634) stated: "An audience is not aware when one is using a unique form of granular synthesis but rather hears the acoustic sum. If a performer is not able to relate and adapt to this environment than the whole effort is meaningless."

## 5 Potential Improvement and Further Development

The portability and adaptability of the piece could be improved by a simpler caption setup, and a grouping of thresholds of the same level and effect in similar sounding sections. But any compromise on flexibility might result in a more confined experience of performing the piece, which is why several more inputs from several performers will be needed to decide which enhanced control form was useful to the performer, and which was in the realm of overkill.

For me, the next real issue to explore in mixed music is to improve the acoustic blend of instrumental and electronic sources, again to enhance both performer and listener experiences of this amazing genre of music.

## 6 Acknowledgments

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