

The Interface as an Extension of Composition in Mixed Music

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Abstract. This article attempts to see the links between the different elements of a mixed music composition (score, electronics, performance) as different types of interfaces. The article focuses on different aspects of poiesis and aesthesis within the use of interfaces in mixed music. The final section also goes through my own compositional process and ideas as a counterweight to some of the earlier given examples.

Keywords: mixed music, composition, contemporary classical, interface, electroacoustic

Introduction

Many conferences and publications that use the term “interface” in the context of art focus on the aspect of technological poiesis, while aspects related to aesthesis have a minor role. A balance between poiesis and aesthesis is often the most conducive to research, as well as understanding a piece of music. We should think of what the word interface means. The Merriam Webster Dictionary has the following definitions. Firstly, a surface forming a common boundary of two bodies, spaces or phases. Secondly, the place at which independent and often unrelated systems meet and act on or communicate with each other. Thirdly, the means by which interaction or communication is achieved in an interface.

Although the use of technology in music is a clear interface, there are many other possibilities that are not necessarily technology dictated or so heavy on the technicalities. These definitions reinforce how we can see interface as being all the different technological, musical and practical elements that bind the different elements of a mixed music piece together. In Lacroix (2018), I had separated these elements as score, electronics and performance, which can serve as a base here as well. The interfaces in this article are the different links and glue between these aspects of composition. It is important to note that these are not only physical or digital “things” but relationships between different actors (digital, human, physical and conceptual).

In this article, I will focus on the musical, pragmatic and conceptual interfaces connected to mixed music. Firstly, we will look at a definition of mixed music to make it clear which repertoire we are talking about. Secondly, we will go through the use of interfaces when composing mixed music. Thirdly, we will look at different interface possibilities when it comes to performance practice. Finally, we will look a bit into my own compositional process to look at a few examples of interfaces within compositions.

Mixed Music

Before being able to discuss any meaningful repertoire and its musical, philosophical and technological paradigms, one must first define its limits. Generally, one refers to mixed music as a type of music in which one finds electroacoustic and

acoustic sound sources. However, as Teruggi (2016) notes, this includes almost all types of modern popular musics which is not what is meant. Mixed music is a type of music in which one finds both sound sources, but also that the classical music concert is at its heart (Tiffon 2005). This definition also excludes the large repertoire of more improvised musics that use technology which often has more in common with experimental jazz and popular musics than classical music. Tiffon (2013) explains that mixed music is only truly mixed when the composer succeeds at combining both electroacoustic and acoustic writing. Mixed music is about the dialogue between both (Ibid). The strict limitation of the terminology is not meant as an aesthetical judgement on different types of music, but only to delimit a specific repertoire for this article.

Écriture's Interface

The challenges and pitfalls of mixed music have been written about for decades both from composers and performers. The whole concept of the genre is the hybridization of the note-based musics and sound-based musics (Landy 2007). How does one compose in such a hybrid sense? The difficulties of the notation of electroacoustic music have also been a challenge for many years (see Roy 2003 ; Thoresen and Hedman 2006 ; etc). Combining both worlds seems like a daunting task to say the least and it has both conceptual and notational problems which is where the concept of the interface becomes important. How does one write meaningfully between two different traditions, and nonetheless modes of working? How does this interface function? Although notation is already mentioned, I will not be discussing it at length. It's an issue all of us composers face and that has no easy solution. I will concentrate specifically on the interface between the acoustic and electroacoustic in the compositional phases.

How does one write a new piece that also uses elements of technology? Does one start with the notated score? Does one start with the electronics? The literature on the compositional process in mixed music is difficult to follow and completely trust since it is dominated by a handful of institutions. Acosta (2016) for example, raises the question of the amount of literature from places where the figure of the computer sound designer (often called RIM in the literature for *réalisateur en informatique musicale*, a decidedly French term) does not exist. It is much easier to find information on the act of *écriture* for composers with a large institutional backing such as Philippe Manoury and Kaija Saariaho than a composer like Einar Kandrung or Natasha Barrett that have had to mainly do everything themselves.¹ The *modus operandi* and the creation of IRCAM are directly linked to these possibilities. Boulez' idea was to combine the work of scientists and artists to be able to create interesting art (Jameux 1991). Although Born (1995) has shown the inherent inequalities of this model, it is still essentially practiced to this day in many of these institutions.

How do composers work with the interface of composition between both sound worlds? It seems to vary especially on whether the composer exactly has institutional support. The compositional process is personal, rhizomic², and far from straightforward (Delalande 2007) but recently there have been more critical studies about it. Jean-Luc Hervé proposed a model for the compositional process which is mainly separated into two lines: the material and the sonic image in the composer's head (recreated in Donin 2013, 1646). These lines eventually cross into the formal plan/sketches of the composition before being synthesized into an actual realization of a single section and eventually the whole piece. However, this model is aimed at explaining the compositional process of acoustic music. When we bring into it the work with electronics, it becomes fuzzier and blurry. However, I would argue that the composition of mixed music is closer to the development of software and would look more like this:³

¹ It should be mentioned that having to do everything yourself is both a blessing and a curse.

² I would argue that the compositional process has all the rhizome characteristics that Deleuze and Guattari outline (1987).

³ This outline is also inspired by Servièrè (2010)

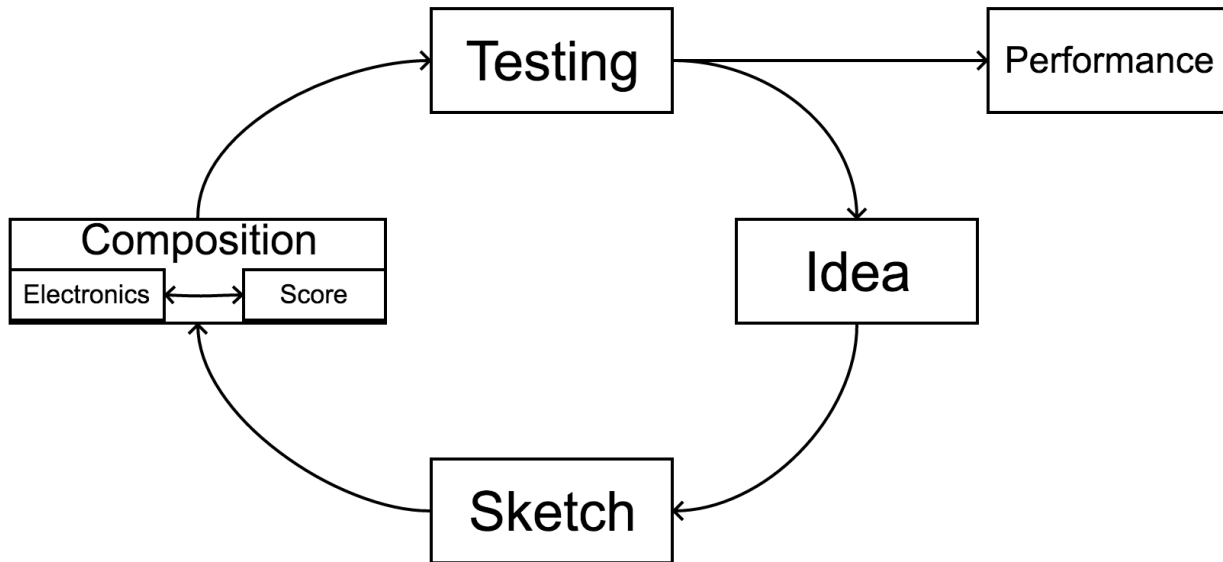


Figure 1. Compositional process

If we consider the literature on mixed music, there is a large variety of how composers interact with the compositional process and the development of the electronic ecosystems that they need. Many institutionally supported composers mention writing the electronics at the same time as the score. Saariaho mentions that this is part of musical language (Cohen-Lévinas, 1999). Manoury (2012) explains that it is a crucial aspect of his process, and that both highly influence each other. Harvey (Donin and Theureux 2008) and Murail (Cohen-Lévinas 1999) have also expressed similar attitudes. However, one does have to ask the question if this is completely correct. I am convinced that the use of electroacoustics is vital to these composers, but the practice of the RIM and other assistants, when documented, shows a slightly different story.

Faia (2014) covers in-depth his work with Harvey, which mainly shows a composer that struggles with technology. Nuno's (Nouno et al 2009) also shows this side of Harvey as a very open composer that is highly influenced by his assistants. This is not to say that Harvey's pieces are actually made by his assistants⁴ but that their influence is markedly felt and heard within the produced music although filtered through Harvey's aesthetics and ideas. This also seems to be the case in Baschet's music. She had clear ideas of what she wanted but the means of doing it were quite complicated and the compositional process often had to be interrupted by more scientific endeavors of working with the sensors on the bows (Bevilacqua et al 2012).⁵ Saariaho is well known for her work in the 80's and early 90's. However, for many years her MaxMSP patches do not reflect what is supposed to happen according to the score and explanations. In her piece *NoaNoa* (1992) the amplitude of the flute is supposed to modulate the amount of reverb. However, this has not been the case for many versions of the MaxMSP patches.⁶ These examples paint a picture that although these

⁴ And it should be mentioned that Harvey's action of giving royalties to Faia was the first time a composer had forfeited any royalties to give them to his/her assistant.

⁵ It should also be mentioned that this has recently been changed as Serge Lemouton has created a new version of the piece which exclusively uses audio descriptors (Baschet et al 2019).

⁶ I am indebted to Simone Conforti to have brought this to our attention in class on electroacoustic performance at IRCAM as part of Manifeste 2019.

composers mentioned the importance of the interface between acoustic and electronic, it is not truly maintained and that the relationship is more frayed than most would think. The issue of conservation also looms strongly here, and it is luckily being brought up more and more in for example Bonardi (2013). Often a patch needs to be edited and partly re-made even if it's only from a few years ago. New updates in either MaxMSP or on the operating system can also mean severe problems that need to be addressed. Often, one can also see solutions that were done quickly within a rehearsal be saved as the main patch, with little to no documentation on why that was done. Recordings can also be edited afterwards or have completely new electronic tracks made only for said recorded offline, therefore removing a certain immediacy and liveness that is integral to mixed music. These are only some of the many issues in conservation of mixed music.

For many composers outside of institutional support, the situation is quite different. Berweck (2012) mentions how he often had to directly contact composers to get the electronics. Additionally, the composers often had to modify the electronics (or sometimes, Berweck himself had to do this) to be able to get the pieces performed once again. This also shows a much closer possible relationship between the *écriture* and the electronics, but one that is also fraught with many dangers. Acosta (2016) for example, seems to mainly have made her electronic ecosystems before the scores are written or even worked on. For other composers such as Di Scipio (2018) the creation of the electronic ecosystem is in itself the main act of composition.

It becomes clear that there is truly no cut and paste method to work between the interfaces of acoustic and electroacoustic writing. Herein lies the challenges of mixed music: one should master both types of writing and find his/her own way of combining both. This is what makes the genre exciting and interesting. Ungeheuer (2013) mentions that the duality of human and machine is gone from the genre, which I respectfully disagree. This is in many ways the essence of the genre since we have no clear-cut methodology and it is still used in many pieces exactly as an (artistic) interface between both worlds such as in Jodlowski's *60 Loops* (2006). It is where the tension lies both compositionally and when thinking in terms of the interfaces of mixed music.

Performance Interface

Another interface to address in the context of mixed music is how to connect the performer to the composition and its ecosystem. There are many aspects here that are worthy of discussion ranging from different synchronization strategies to how the musician interacts with the electronics. Performers have a tradition of writing about the challenges of mixed music such as Berweck (2012), Ding (2006), McNutt (2003), Kimura (1995, 2003) and Pestova (2008) among others. These texts give the reader a clear picture of many of the challenges that face performers of this music: electronics not working, lack of training in the use of electronics, prohibitive interpretations, lack of information and obsolescence among others. In the context of this article we will mainly be looking at prohibitive interpretations and the design of the electronics to give a clear musical meaning for the musician and audience.

A typical complaint from musicians is to be forced to use a click track. Although certain musicians have lauded the use of click tracks in its possibilities for improvisation (Ding, 2006), most seem to be against the practice such as Kimura (1995, 2003) and McNutt (2003). In my own experience, giving classical musicians a click track can cause them to stop listening to each other. For example, string players' intonation can become an issue. I would also argue that temporal flexibility is often an important element in a lot of art music ranging from classicism to contemporary music. Listening to older recordings shows us this, and it is also argued in several historical documents (Day, 2002 ; Howat, 2009).

So then, what does one do in musical passages that are highly striated or amorphous time to invoke Boulez' (1963) temporal terminology? There are many different solutions which serve different musical and performance aesthetics. In a piece like Nunes' *Einspielung I* (1979-2011), it would be unrealistic to ask the musician to trigger all the events. Therefore it was traditionally done with the RIM manually activating the different events although recently a new version using score following has had success (Daubresse 2015 ; Pages 2013). In other pieces the effort of the musician can be part of its aesthetics, which reflects ideas that Ferneyhough (2006) has written about. For example, Tzortzis' piece *Incompatible(s) IV* (2010) is physically very demanding for the bass clarinetist, and the action of having to press the pedal is part of this. However, as a compromise when I played this piece with the composer present at IRCAM in June 2019, I had to press the pedal a few times from my FOH position to help the performer.

In a more amorphous context, using score following would often also cause trouble for the musician, not being able to trust the computer as his/her trusted accompaniment.⁷ In this context using different synchronization strategies such as tape or triggering through a MIDI pedal might give a more musical result that is easier for the performer. There is also, always the possibility that returning to the stage of writing the piece and working on the arrangement to make it work for all parties involved. In the same way that we expect a good classical composer to be able to properly arrange for a string section, we (as a community) should also expect composers to be able to arrange their electronics both sonically and performance-wise into something playable.

Personal Approach & Conclusion

These issues and concepts have been on my mind as I have written mixed music. Additionally, the idea of processes which are not necessarily completely determinate beforehand, or not completely calculated before performance have also become an interest. This is similar to Manoury's concept of virtual partitions (Manoury 1998). The question then arises, why would anyone want "unfinished" processes within a type of music that is mainly through-composed? How does this interface function?

Firstly, these processes can sometimes help the musicians and make them sound better. An example of this is from my solo flute piece *North Star* (2018). At several points the computer will analyze the pitch of the flutist before creating a musical process that is based on that pitch. In a tape version of the piece, if the musician played the wrong note, the section would sound wrong. In a live electronics version, if the musician would play the wrong note, the electronics would help him/her cover that up. This principle could even be used to change an electronic event in case of different tunings of instruments. While playing in different cities at different venues it can quickly happen that one piano is in A=440, while another is A=442, yet both can sound right. In this example, a pitch tracker is used and then the notes after the Bb are based on tracked pitch by semitones. This makes the music be slightly more process-based (+2, -1, etc) but it still retains a through-composed sensibility. In the score the part is written as it should be optimally played by player and computer.

⁷ Slow tempi and repeated notes have been one of the problems for score following for many years.

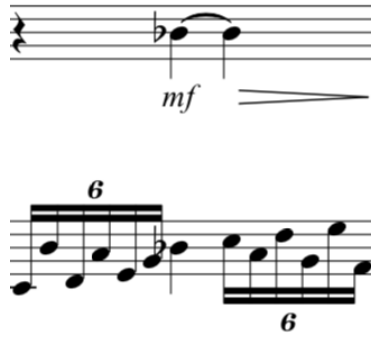


Figure 2. An interface example in the electronics of North Star (2018)

Secondly, this permits a greatly flexibility in the interfaces between the musician, the electronics and the composition which allows more interpretation as well. One of the great joys of the classical repertoire is exactly how flexible it is. A Beethoven sonata played by András Schiff is completely different from the same sonata played by Paul Lewis. Rigid interfaces and synchronization can often lead to less flexibility stylistically. In the case of contemporary mixed music, it is often difficult to say if it's the interpretation or the interfaces which are too rigid as there are rarely several recordings of a single piece, and most of them have little rehearsal times. In this sense, little has changed since the post-war avant-garde of Boulez and how his Domaines musicales to fight these problems, specifically with too few rehearsals (Jameux 1991). By having more open processes in a composed piece, it is possible for the musician(s) to play with a bit more flexibility. Loose synchronization strategies in pieces that are well written can let both the performer and electronics breathe in a way similar to the classical repertoire. These processes can also open interesting compositional doors that would not be available otherwise. Some of the processes in Hans Tutschku's music, especially *Zellen-Linien* (2007) is an example of this.

Another example from my own music is the piece *Facing Gaia* (2019). The music is written in an almost Romantic idiom that needs to contract and expand as the musician plays. Rigidity in composition and electronics would completely hamper the pianist in being able to make the music meaningful. When the piece was being written, this was a concern for the pianist Ana Claudia Assis when tape was mentioned to do a quick work in progress in August 2019, in Belgium.⁸ The example shown below, shows that this rather elastic *écriture* can make it difficult to put things to a grid. The solution that was used at this work in progress concert was that I would trigger tape parts myself, slowly mixing them together. Each tape part was essentially longer than what one would calculate from the metronome, and generally had little that was in striated time.

In the finished version of the piece, the electronics are launched directly by the pianist using a MIDI pedal, but most aspects of the sound are taken from analyzing the sound the pianist is making in real-time with the use of audio descriptors and score following. These different forms of information from the real world helping to glue everything together and forming an interface between the music, the musician and the performance.

Thirdly, this extra level of interpretation and flexibility can make the piece of music easier to learn for the musician(s). Bullock (2013) as well as many of the previously mentioned articles in the last section mention how daunting a task this type of music can be. Shouldn't we be working on making it playable? I do not mean to write easy music or making artistic concession, but to make music in a meaningful way that can connect with the musician and from there, to the

⁸ It should be mentioned that the piece was never intended to be for tape, only for live electronics but had to be "converted" to tape for a work in progress showcase as part of the Musiques et recherches composition workshop in August 2019.

audience. In essence, the audience could not care less if a piece is with tape, live or anything in between, it is meaningless. However, to the musician(s) that took the time to learn the piece, it can be very meaningful if whatever synchronization strategy was used was meaningful and made sense for that piece of music.

Fourthly, these changes and increased flexibility can be heard by the audience. However, this is not always possible in the case of rigid electronics. With more flexible temporality, electronics and interfaces, the musician can relax much more and play within her/his normal idiom and comfort zone as a classical musician. I am convinced that this can also be heard by the audience, not necessarily that they can hear if the electronics are live or not, but mainly that the feel and flow of the music is more relaxed and fluid. It's an important step in creating a better performance practice which can heavily influence the final result.

I feel it is relevant to mention a maxim my first music teacher often told me many years ago: "You are playing for all the audience, not the three people at the back who have a clue about how you orchestrated your paradiddle". This concept of interfaces permits us to review how we address musical issues from the score to the electronics to the performer(s) to make a good artistic statement. After all, isn't music just an interface between people?

References

- Acosta, Sabina C. 2016. *Pour une écriture multimédia dans la composition musicale*. Université Paris VIII, France.
- Baschet, Florence, Lemouton, Serge & Marillier, Léo. March 18th 2019. *Décryptage de BogenLied* (lecture). IRCAM, Paris, France. Retrieved from : <https://medias.ircam.fr/x281999>
- Bevilacqua, Frédéric, Baschet, Florence, & Lemouton, Serge. 2012. "The Augmented String Quartet: Experiments and Gesture Following," *Journal of New Music Research*, 41(1), 103–119. <https://doi.org/10.1080/09298215.2011.647823>
- Berweck, Sebastian. 2012. *It worked yesterday: On (re-) performing electroacoustic music* (University of Huddersfield). Retrieved from <http://eprints.hud.ac.uk/17540/>
- Bonardi, Alain. 2013. "Pérenniser pour transmettre, transmettre pour pérenniser—Destins de l'œuvre mixte interactive," In Évelyne Gayou (Ed.), *Musique et Technologie—Préserver, archiver, re-produire* (pp. 105–126). Paris, France: Institut National de l'audiovisuel.
- Born, Georgina. 1995. *Rationalizing Culture: IRCAM, Boulez, and the Institutionalization of the Musical Avant-Garde*. California, USA: University of California Press.
- Boulez, Pierre. 1963. *Penser la musique aujourd'hui*. Genève, Switzerland : Gonthier.
- Bullock, Jamie, Coccioli, Lamberto, Dooley, James, & Michailidis, Tychonas. 2013. "Live Electronics in Practice: Approaches to training professional performers," *Organised Sound*, 18(02), 170–177. <https://doi.org/10.1017/S1355771813000083>
- Cohen-Levinas, Danielle. 1999. *Causeries sur la musique: Entretiens avec des compositeurs*. France: L'Harmattan.
- Delalande, François. 2007. "Towards an Analysis of Compositional Strategies," *Circuit: Musiques contemporaines*, 17(1), 11. <https://doi.org/10.7202/016771ar>
- Deleuze, Gilles & Guattari, Félix. 1987. *A thousand plateaus* (trans. Massumi, B.). Great Britain, Oxford : Bloomsbury Academic Press.

- Daubresse, Éric. 2015. "Autour d'Einspielung I d'Emmanuel Nunes," *Dissonance / Dissonanz*, (130), 8.
- Day, Timothy. 2002. *A century of recorded music: Listening to musical history*. New Haven: Yale University Press.
- Ding, Shiao-Uen. 2006. "Developing a rhythmic performance practice in music for piano and tape," *Organised Sound*, 11(03), 255. <https://doi.org/10.1017/S1355771806001518>
- Donin, Nicolas, & Theureau, Jacques. 2008. L'atelier d'un réalisateur en informatique musicale: Entretien avec Gilbert Nouno. *Circuit: Musiques contemporaines*, 18(1), 31. <https://doi.org/10.7202/017906ar>
- Donin, Nicolas. 2013. "L'auto-analyse, une alternative à la théorisation?," Donin, N. & Feneyrou, L. (Eds.) *Théories de la composition musicale au XXe siècle* (pp. 1629-1664). Lyon, France : Symétrie.
- Faia, Carl. 2014. *Collaborative Computer Music Composition and the Emergence of the Computer Music Designer*. Brunel University, England.
- Ferneyhough, Brian. 2006. *Collected writings*. England: Routledge.
- Howat, Roy. 2009. *The art of french piano music: Debussy, Ravel, Faure, Chabrier*. New Haven: Yale University Press.
- Jameux, Dominique. 1991. *Pierre Boulez* (S. Bradshaw, Trans.). London, UK: Faber and Faber.
- Kimura, Mari. 1995. "Performance Practice in Computer Music," *Computer Music Journal*, 19(1), 64. <https://doi.org/10.2307/3681300>
- Kimura, Mari. 2003. "Creative process and performance practice of interactive computer music: A performer's tale," *Organised Sound*, 8(03). <https://doi.org/10.1017/S1355771803000268>
- Lacroix, Mathieu. 2018. *Deux Ex Machina : Methods, Processes and Analysis of Mixed Music*. Proceedings of the Electroacoustic Music Studies Network Conference, Florence, Italy, June 20-23 2018.
- Landy, Leigh. 2007. *Understanding the art of sound organization*. Cambridge, Mass: MIT Press.
- Manoury, Philippe. 1998. *La note et le son: Écrits et entretiens 1981-1998*. Paris, France: L'Harmattan.
- Manoury, Philippe. 2012. *La musique du temps réel: Entretiens avec Omer Corlaix et Jean-Guillaume Lebrun*. France: Édition MF.
- McNutt, Elizabeth. 2003. "Performing electroacoustic music: A wider view of interactivity," *Organised Sound*, 8(03). <https://doi.org/10.1017/S135577180300027X>
- Page, Sandrine. December 9th 2013. *La synchronisation dans les œuvres de musiques mixtes avec suivi de geste et de partition* (lecture). Séminaires Recherche & Création, IRCAM, Paris, France. Retrieved from : https://medias.ircam.fr/xf3bd1b_la-synchronisation-dans-les-uvres-de-musi
- Pestova, Xenia. 2008. *Models of Interaction in Works for Piano and Live Electronics*. McGill University, Montreal, Canada.
- Roy, Stéphane. 2003. *L'analyse des musique électroacoustiques: Modèles et propositions*. Paris, France: L'Harmattan.
- Servière, Antonin. 2010. "Processus de composition et artisanat : L'exemple de Trei II (1983) de Michael Jarrell," *Dissonance / Dissonanz* (120), 16.

Teruggi, Daniel. 2016. "Esquisse d'une taxonomie des musiques mixte," Battier, M. (Ed.) *Musique et technologie : Regards sur les musiques mixtes* (pp. 12-20). Paris, France : Institut national de l'audiovisuel.

Tiffon, Vincent. 2005. "Les musiques mixtes: Entre pérennité et obsolescence," *Musurgia*, 23–45.

Tiffon, Vincent. 2013. "Musique mixte," Donin, N. & Feneyrou, L. (Ed.), *Théories de la composition musicale au XXe siècle* (pp. 1297-1314). Lyon, France : Symétrie.

Thoresen, Lasse & Hedman, Andreas. 2006. "Spectromorphological analysis of sound objects: An adaptation of Pierre Scaheffer's typomorphology," *Organised Sound*, 12(2), 129-141.

Ungeheuer, Elena. 2013. "L'électronique live. Vers une topologie de l'interaction interprète-machine," Donin, N. & Feneyrou, L. (Eds.) *Théories de la composition musicale au XXe siècle* (pp. 1367-1386). Lyon, France : Symétrie.