"Humanizing the machine: Finding a balance between interaction and interpretation in live electroacoustic music"

Abstract:

Composition and improvisation often present themselves as two contradictory forces in the creation of live electroacoustic music. Most such works will however incorporate both elements to varying degrees, and it is the aim of this research to firstly investigate why and how they oppose each other, and secondly develop an "interaction-interpretation spectrum" via historical research to examine the presence and significance of either in any given work. Following that, an artistic research will be conducted to put those findings into a practice-based format, allowing a qualitative indication of the musical merit of original works when their compositional and improvisational content are known. Ultimately the research aims to provide both a resource and an objective for the creation of new electroacoustic music, for the benefit of the researcher and other electroacoustic musicians.

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Liveness in Music
The first regularly recurring theme in the currently available literature is the incentive to providing a live performance platform for electroacoustic music. We know that music technology originated as a means of recording live performance for future re-listening, which inevitably explains how the earliest purely electronic compositions (e.g. Schaeffer, Varèse et al.) were exclusively in a fixed-media format, i.e. they existed purely in a non-acoustic format that could not be performed live. To deny electronic or electroacoustic music the opportunity for live performance however is to deny it the sonic gesture (Emmerson, 1998) and the "visceral dramaturgy" (J. Clancy, personal communication, 27 August 2019) that simply cannot be replicated on tape, analogue or digital. In other words, we know that the real-time experience of sound in space, with all its accompanying sonic intricacies, is unique to the live performance of music. We may then postulate that attempting to bring electronics into a live performance platform, something which is very much enabled in the 21st-century by the digitization and miniaturization of music technology, is in the desire of enhancing such music through the live experience – some modern-day examples include the work of Peter Knight, Seth Thorn, Gordon Mumma, Angélica Négron etc. What is unknown at this point is the (non-)existence of any particular "standard practice" of doing so, with the particular techniques and methods employed by practitioners varying to great degrees. Of particular interest to this research is where along the improvisation-composition spectrum such works lie, i.e. to what extent is the artist interacting with sound in real-time, or interpreting from a prescribed composition?

The Issue of Notation and Repertoire
One unique challenge in the live performance of electronic music is how there is rarely a direct and perceivable relationship between physical action and sonic result, which has been described as a "removal of source from cause" (Frengel, 2010), much unlike the case of acoustic instruments. For example, a performer's single physical action on an electronic instrument can easily result in an entire array of unrelated sounds – immediately it is clear to see how this can be troublesome to notate. Additionally, there is little rationale for such music to be notated anyways, since the objectives of such works rarely include the creation of new repertoire that can be repeatedly performed by others (Appleton, 1999). We know therefore that there is a lack of any standardized system of notation where live electronics are concerned, which in turn suggests that the performance of such music will always involve improvisation to some degree, more so than interpretation from a score – an obstacle for those more traditionally trained in a notated discipline, as well as those wishing for a more concrete, compositional approach to the creation of such works...

"Inadequacy" of True Improvisation
This desire for a more composition-based approach stems from the oft-repeated (and arguably Euro-centric view (Hamilton, 2020)) that true spontaneous improvisation will always have a poorer compositional quality than if the artist were given weeks and months to construct the music. Im-

provisers are simply more interested in experiencing the adrenaline of the live moment than the compositional quality of their output, with little intention of repeat performances (Appleton, 1999), implying the need for some kind of composition-based practice to improve the quality of such music. A corollary argument however is that there simply is no such thing as "true improvisation": even in unprepared situations, the improviser approaches the space armed with their training and prior experience – in this sense then improvisation is simply another compositional technique in the same vein as inversion, counterpoint, spectral analysis etc.; Vice versa, composition might be viewed as a form of atemporal improvisation (improvisation occurring outside of real-time) (Knight, 2011; Alperson, 1991). There is evidently no clear consensus, therefore, to whether an improvisation-based approach can be correctly seen as "inadequate" beyond the fact that such music is generally not designed to be performed more than once – we further discuss this issue in section 4 of this proposal.

Compositional Authority
If true improvisation is indeed inadequate, then a final recurring theme in the available literature discussing the "technical perfection" of non-improvised electronic music, specifically in the case of fixed-media, offers an answer of sorts. Since the days of *musique concrète* the great allure of machine-made music for composers has been the lack of technical limitations imposed by human physiology and its resulting imperfections, or deviations, from the prescribed score (Patteson, 2016). Simply put, if the performer is a machine, the composer can expect a definitive rendition from every single performance, meaning the composer and nobody else has absolute authority over the music. We can easily appropriate these sentiments to describe an entirely composition-based approach to today's live electroacoustic music: a hypothetical piece that is exhaustively pre-composed, has a score of some kind notating every event to the last detail, and is performed by humans operating a computer, could be expected to yield reasonably definitive, repeatable results (as compared to an improvisation-based piece). Note that the only real difference here from fixed-media works is the bare-minimum inclusion of a human performer to satisfy the aesthetic virtues of live music-making. In comparison then to improvisation, we are balancing the exchange of liveness and gestural dramaturgy for technicality and compositional quality (Aveyard & Wilkinson, 2018; Ashline, 2003); in other words, exerting more or less creative authority over the machine. It is in the ultimate interests of this research to explore the musical results of either extreme, and define several benchmarks along the interaction-interpretation spectrum that may become useful for other live electroacoustic musicians in their own music-making.

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