

# “Comprovisation”: The Various Facets of Composed Improvisation within Interactive Performance Systems

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**A**fter performing on a laptop in a recent “free music” concert together with Korean pianist and improviser Changsoo Park, I began to realize that, in spite of having always considered myself to be a composer of through-composed music, I have often flirted with and incorporated improvisation into my music when playing the role of electronic musician. This has taken the form of instrumental improvisations to be played over pre-recorded “tape” music, “generated sequences” for both computer and performer, tinkering with Max patches during an interactive performance and interactive musical instrument design. In all cases, there is a very important “composed” element on the technological side, even when there is a large degree of spontaneity and freedom on the musical side. Nonetheless, this moment of reflection has served as a springboard for refining my musical thoughts and ideas regarding the role of improvisation in electronic and computer music and to try to discover the balance between composition and improvisation when technology is involved.

It is strange that the concept of improvisation—in spite of its being a core element of much traditional music around the world, common in art music from the Middle Ages through the baroque all the way to jazz and having been present in the realm of electronic music as early as the late 1950s—has been a much-maligned notion in contemporary western art music. Part of the problem may be our own viewpoints in this age of recorded media; making music had long involved an improvisational aspect until the advent of recorded sound. Our relatively newfound ability to record and listen again to a particular performance has undoubtedly changed the way we think about musical performance and performance practice in general. It has also heavily influenced our individual reactions to live music and concert-going in general. Nonetheless, it was precisely this ability to record and replay sound that gave birth to electroacoustic music and has perhaps reinforced our idea that electronic and computer music is equivalent to music on fixed media. “The freezing of sound as recordings is central to [the] electroacoustic music that dominates the computer music community” [1]. However, for many years the notion of interactive composition and interactive performance has relied on combinations of recorded and pre-composed material on the technical side in conjunction with live and improvisational elements on the performance side.

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## **LISTENING, REACTING, AUGMENTING, CREATING**

Although Thom Holmes rightly points out in his book on electronic and experimental music that “improvisation defies clear definition,” he does proceed to formulate a rough definition, stating that it has to do with a process of listening, reacting, augmenting and creating. This process could be equally applied, as a “plan of action,” to the domains of composition and performance as well as improvisation [2].

In the early 1990s I was involved with the Atelier d’Improvisation Expérimentale (AIE) while studying electroacoustic music at the Centre International de Recherche Musicale (CIRM) in Nice. The “atelier” was a variable-sized group of young musicians under the guidance of Michel Pascal, performing on electronic instruments and electronically processed acoustic instruments. In performance, creating a convincing musical structure by listening to one another, reacting to one another, augmenting musical material and creating new musical material were our primary goals, regardless of whether or not we were working with a pre-determined form.

Although we were truly improvising music and sounds together freely without any pre-composed or previously notated material, we certainly pre-composed the kinds of electronic processing we were doing. At the time it was either a pre-composed sequence of presets on an effects box or pre-designed patches on a synthesizer. Today, a mere decade and a half later, we would have achieved the sound with pre-programmed software on a computer. But just how close to being completely improvised can interactive electronic music become when we are by nature dealing with the finite limits inherent in our hardware and computational tools?

The kind of pre-composition we were doing in the AIE was not musical or compositional construction, but rather composing an “instrument” in the form of a pre-designed and pre-defined interactive musical system. This is one of the two basic species of composition-improvisation relationships intrinsic in working with electronic and computer music: (1) composing an “instrument” that can be improvised upon in performance, and (2) improvising with tools in order to create pre-compositional material. Whereas the former relationship related to luthierie and instrument design, the latter relationship has always been an important technique for studio work. The im-

## **ABSTRACT**

This article discusses the balance between composition and improvisation with respect to interactive performance using electronic and computer-based music systems. The author uses his own experience in this domain in the roles of both collaborator and composer as a point of reference to look at general trends in “composed improvisation” within the electronic and computer music community. Specifically, the intention is to uncover the limits and limitations of improvisation and its relationship to both composition and “composed instruments” within the world of interactive electronic musical performance.

provisational aspect in both of these scenarios is nonetheless still constrained by the limits and limitations imposed by the hardware and software tools used.

### IMPROVISING IN THE (HOME) STUDIO

Trevor Wishart, a multifaceted composer, performer, improviser and computer music programmer, mentions that working in the studio is akin to “slow improvisation”—improvisation as a material-generating device or a means of transforming existing musical material, rather than as a performance device. As such, Wishart does not consider there to be an “unbridgeable gulf between improvisers and composers (especially studio composers) that some musicians seem to want to erect” [3]. One can perceive this “slow improvisation” while listening to many classic early tape pieces, such as Luciano Berio’s “Thema,” or “Visage,” for example—it is not difficult to imagine Berio together with Cathy Berberian in the studio recording and re-recording vocal material in an improvisatory fashion during a recording session, nor to imagine Berio subsequently trying out myriad sound-processing techniques in the studio. If the equipment in an electronic music studio can be considered the electronic musician’s instrument, we can imagine the composer as a studio improviser.

Certainly, improvising on an instrument while in the process of composing is not foreign to most composers. Even Stravinsky in his “Poetics of Music” mentions that composers often forage aimlessly like animals in order to seek out new musical territory [4], not to mention his over-cited quote about composition being frozen improvisation—certainly a notion from the age of recorded music! In fact, although improvisation is a word “heavy with connotations and implications,” it is in fact precisely what transpires during the act of composition [5]. It is this kind of musical play and experimentation with technology that has accompanied us from the studio into the home studio of today’s electronic musicians, and this relationship of improvisation as a material-generator for composition is still an important aspect of much electronic and computer music today.

### COMPOSING A MUSICAL INSTRUMENT

Our other improvisation-composition relationship deals with instrument design.

Very often when working with technology, it is the instrument that must first be composed in order to have performance, and consequently, improvisation. A musical instrument, whether acoustic or electronic, can be defined as “a self-contained and autonomous sound-producing object that enables a musician to perform in a live situation” [6]. It is therefore the job of the electronic/computer musician to design and “compose” a rich computer music performance system. Such a system should not be designed to perform one lone task, as with a tool, but should be designed to evolve or metamorphose in the hands of a competent performer, in the way that a performer of an acoustic instrument can coax a multitude of seemingly different sounds out of their instrument.

One of my earliest attempts to design or otherwise compose a live computer music performance system was in the context of some improvisational performance with Atau Tanaka. For the performance I designed a computer-based processing system for my viola, using the then-new software SuperCollider, which offered real-time audio processing on a Macintosh PowerPC computer [7]. The processing was limited to recording fragments of the live viola sound and processing them via granular playback, with optional resonant filtering. It was a very simple system and seemed only just barely, with the aid of a foot controller and a pedal, capable of evolving from its limited processing palette.

According to Tanaka, a computer music performance system generally contains an input device to acquire data, mapping algorithms to translate data into musical information, a sound synthesis engine to be played by the live input, a compositional structure to define the musical progression of the work and an output system to diffuse/perform the resulting sounds in the performance space [8]. It is of note that this definition of what is ostensibly an “instrument” also includes a compositional structure at its core, even if the instrument is going to be used for improvisation, and not a fixed composition. (Imagine if Amati had deemed it necessary to engrave and inlay a specific composition on the wood of his violins, in lieu of the fleur-de-lis motif of the French court!)

### LIMITATIONS

Tanaka elaborates that in the context of a composition, the software “is at once the score of the piece as it is part of the instrument definition,” and that in the

context of an improvisation, the software (and hence the “score”) should be “programmed in such a way to give the widest possible range of expression in each sound without changing settings” [9]. Although the widest range of expression was very limited in my first attempt at composing an interactive music performance system due to the technology available at the time, the technological and computational limitations are reduced year by year, as newer, faster computing becomes available.

One possible solution for enriching a simple interactive instrument would be to incorporate composed electronic material within an improvisational setting. While purists may view this as a deception of the audience, a mix of composed and improvised material has been a solution for many composers, performers and improvisers in the electronic music world. Indeed, George Lewis, an equally multifaceted computer musician with a longtime involvement in the domain of improvisation using interactive systems, finds the supposed “problem” of composed and improvised elements coexisting in a composition one of the most exciting elements of including technology in an improvisational setting [10].

Although in the early days of real-time audio on home computers in the 1990s there were severe limitations on processing power, these limitations nonetheless provided “a healthy constraint imposed on a nauseating infinity of possibilities” for many composers [11]. In a performance situation this translates to carefully calculated pre-composed electronics. Although the constraints on real-time processing lessen with each subsequent, and faster, computer model, a performance environment or instrument must nonetheless be composed carefully within the processing power available.

### CONCLUSION

Although improvisation can be used as a precursor to composition, and composed instruments can be used in an improvisational setting, there is a wide spectrum determining just how composed the technological part of an interactive performance system can be. This spectrum is growing wider with technological progress. In fact, the trends in laptop ensembles and the use of “live coding” as a means of electronic performance are removing our conceptions about the limitations inherent in electronic musical performance [12]. Above all, composers and electronic musicians are beginning to shed their misconceptions

about the role of improvisation and its balance with compositional elements in electronic music.

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