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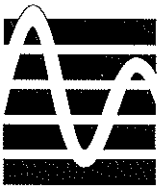

HYPERIMPROVISATION:

COMPUTER-INTERACTIVE SOUND IMPROVISATION

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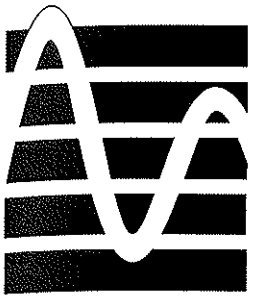


ONE

Computers as Cultural Forces

> If there comes into being a medium in which a composer writes a program, in which one or perhaps many performer-listeners execute the program on a computer synthesizer, in which the performer-listeners can interact with the program in complex ways to influence the course of the sound, in which there may be no audience, either by choice of the performers or because the potential audience prefers to do its "own thing," should the medium be called music?
>
> —*M. V. Mathews, F. R. Moore, and J. C. Risset, "Computers and Future Music" (1974)*

> The composer's freedom to explore the data world should not be limited by the audience's level of musical/aural perception.
>
> —*R. Povall, "Compositional Methods in Interactive Performance Environments" (1995)*

Since this is a book about the use of computers in sound and musical improvisation, it does not deal with computers alone. However, the broader impact of computers necessarily influences their use, and the perception of their use in the arts in general and improvisation in particular. Computers are now orders of magnitude smaller, faster, and cheaper per unit processing power than ever before. They are also distributed throughout the community more and more widely, and there are many public access points, particularly to their use as nodes on the Internet. Thus, unlike many nonelectronic commodities, computers are increasingly accessible economically and practically. For most people, a computer is primarily a vehicle for recording, analyzing, and processing practical and business data efficiently. This functional aspect desensitizes users to the creative uses of computers and may even polarize them against computer art and computer performance.

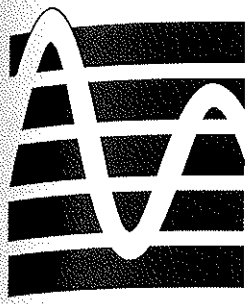
Katherine Hayles argues (Lunenfeld 1999, 69ff.) that "virtuality is the condition millions of people now inhabit. . . . Virtuality is the cultural perception that material objects are interpenetrated by information patterns." The virtual subject is "formed through dynamical interfaces with computers" (p. 93). Body boundaries are "extended or disrupted through proprioceptive coherence formed in conjunction with computer interfaces" such that ultimately they constitute a cyborg, a body that is partly or wholly dependent on computers. "What this interpenetration means and how it is to be understood will be our collective invention. The choices we make are consequential, for it is in the complex, doubly figured, and intensely ambiguous conditions of virtuality that our futures lie" (p. 94).

Using computers across the Internet affords many people access to a myriad of information and contacts that would formerly have been inaccessible, or at least not available on demand without great effort. The contrast between the externally imposed choices of television, on the one hand, and the user-responsive, user-created choices of the Internet, on the other, is substantial. Optimists can view the Internet as a force both toward equalization (most people can enter the same vast terrain at little cost) and decommodification (material formerly only available commercially, and in an elitist market, becomes more generally available and often free).

On the other hand, there is plenty of evidence that computers do not (at present at least) sustain a utopia, in spite of the optimism for the future ("an inexorable emergence") embodied in Ray Kurzweil's 1999 book *The Age of Spiritual Machines*. For example, computer use by women lags behind that by men, in spite of the universality of computers in business environments. Cultural association with male dominance and/or "geekiness" remains. This is reflected statistically in the subjects of this book: as Mary Simoni has argued, a male coterie has, whatever its motivation, tended to exclude women from computer music at large. In computer-interactive sound performance, Laurie Anderson is preeminent, but in its improvisatory counterpart, relatively few women are evident (cf. the discussion of Kaffe Mathews in a later chapter of this book).

There has also been a somewhat uncritical acceptance of computer technologies in the arts by those active in their exploitation. Tim Perkis, cofounder of the Hub, has analyzed this:

> [A]rtists who embrace complex technologies have largely abandoned their critical function and have been co-opted, becoming unwitting (or witting) servants of other social and commercial projects that have little to do with art. As a result in music, there has been a shift in emphasis



SEVEN

Speaking Locally

> Playing a harpsichord with a shovel or an angel conducting the Crystal Orchestra of the Spheres with the twinkling tip of a fine finger . . .
>
> —*M. Waisvisz (Wanderley and Battier 2000)*

Can the software and hardware just discussed be put to use in improvisation and in improvising ensembles? In this chapter I will first discuss this conceptually, and in the solo work of certain contributors, and then consider in more detail the work of a selection of groups that have been active in the field. The approach is primarily thematic rather than chronological, and so a very brief chronological survey and a discussion of future possibilities are provided as a coda to the chapter.

A CONCEPTUAL SYNOPSIS OF POSSIBILITIES IN SOLO AND NETWORKED COMPUTER INTERACTIVE SOUND IMPROVISATION

The idea of hyperinstruments, in which the signaling capabilities of conventional instruments are extended through the detection of specialized features intrinsic to their being played, has already been discussed. Analogous instruments have been devised, for both general and professional use, that are not based on traditional ones, most extensively in the Brain Opera project of Tod Machover and colleagues (Paradiso 1999). There is little distinction between the professional instruments among these and the "meta-instrument" of Laubier and colleagues (Laubier 1998), except that the latter has more complicated interfaces than do most of the Brain Opera instruments, so that the range of possibilities is huge. The meta-instrument can readily be used for large-scale performance works

singly or in pairs (by one or two performers). Laubier considers it "more interesting to move a sound around in space if this movement is connected to its spectral evolution." While this is an arbitrary position, the 32 continuous variables (7-bit quantized) of his instrument certainly permit it: the interface comprises foot pedals and a symmetrical array of pressure-sensitive keys and has been used for both sound and parallel image synthesis and for automated light projection.

It is a logical step from a hyperinstrument to a meta-orchestra, and Laubier's instrument can achieve this. By meta-orchestra I mean not only a software-driven simulacrum of a conventional instrumental orchestra, but also, more broadly, a large ensemble of timbrally diverse instruments that can be performed efficiently by one or a small group of players (or silent conductor(s)). The Eminent African-American trombonist and composer George Lewis, with his Voyager software and its antecedents, is one of the earliest practitioners of such an approach. Commonly, his performance set-up has involved one or a small number of desktop (more recently, portable) computers that fulfill two functions: (1) the software processing of incoming musical information as MIDI and the generation of an output event stream, and (2) the playing of orchestral sound samples, usually by means of computer-based samplers, in which sound samples are played usually from an E-mu Proteus 12 or similar internal computer card, allowing up to 12 independent voices to be played by the computer. This method is analogous to one in which a computer performs the first functions, while the second is provided by a sophisticated external hardware sampler such as a Kurzweil, though Lewis's method is physically more compact. Such meta-orchestras can be driven either by a player of an instrument, such as Lewis's trombone, or directly from the computer.

Lewis describes his *Rainbow Family,* an interactive composition for computer with pitch sensor, synthesizer, and an acoustic player. The computer had a listener function, and the piece was done in part at IRCAM and premiered there in 1984 (see IRCAM Web site):

> I'm trying to help my machines understand musical context. Since good improvisors can't listen to everything, they have to keep track of the context in which they place the sounds they're making and hearing. You have to find structure in what you've just played and heard or, if necessary, posit it or another structure as a point of departure. Improvisors often work in terms of rather loosely defined 'shapes', . . . such as volume direction, pitch direction, duration, rhythm regularity, pitch or duration transposition, time between major changes in output or input, pattern-finding, and frequency of silence. You don't need or want an exhaustive transcription, but instead a fast, general analysis of what's happening at any given