Interview with David Rosenboom

Larry Polansky; David Rosenboom

Computer Music Journal is currently published by The MIT Press.

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Introduction

David Rosenboom, currently Coordinator of the
Center for Contemporary Music at Mills College in
Oakland, has long been an innovator in American
experimental music. He has done significant work
in composition, performance (as a pianist, violist,
violinist, tablist, and electronic instrumentalist),
theory, and instrument design. Among other things,
Rosenboom pioneered the use of computers in live
performance and the integration of biofeedback
techniques in compositional environments. I took
this opportunity to interview him not about his
past, but about current and future trends in his
work. I have supplied a brief discography at the end
for those interested in listening to Rosenboom's
work.

Mental Models of Evolution

Polansky: The theme of evolution—of the artist
and of the artist and society together—seems to be
consistent in your work, for instance, in *On Being
Invisible* and in the "In the Beginning" series [8
pieces for various media, including instruments,
electronics, film, and text]. Is this a conscious
development?
Rosenboom: Interesting point. It's very much re-
lated to what I'm doing right now. I seem to have
this cycle of about four years where I come to a
place in which I have to evaluate myself, or the
idea I've been interested in, and start over. I feel
that I'm at that stage right now. Consequently, I'm
standing back and looking at a lot of my work from
over the years, and one reason that I do distance
myself is that I see consistencies that I didn't know
were there. And now, I'm especially looking at some
pieces from quite far back, some pieces from the

[University of] Illinois days, some early electronic
pieces, and a lot of percussion pieces. I can identify
themes and consistencies that I hadn't before. One
of these is a kind of cosmological point of view;
that is, my music is very much derived from think-
ing about nature and about modeling the universe.
I'm one of those people who likes to try and de-
velop a coherent mental model of the universe.
Polansky: What Jim Tenney calls amateur
cosmology.
Rosenboom: Right. But I do think that one can be a
cosmologist no matter what one's discipline. One
can come to visions of the universe that are quite
strong, that one then begins to articulate. I'm sure
that Einstein had a vision of the universe which he
found a way to express mathematically, but I'm
sure that the vision was there long before the ex-
pression of it. For me this is true in music. To that
extent, evolution plays an important part, because
I'm interested in how the universe evolves, how we
evolve, and how cultures evolve. So you're right, a
lot of my music has more or less consciously dealt
with the process of evolution. In the recent series,
"In the Beginning," there has been a kind of con-
cern with modeling. Since the proportional model-
ing is very abstract, I reached a point in one piece,
#5 (subtitled "The Story"), where I decided to talk
about the whole idea of modeling in itself. For me,
the personification of the model was the concept of
the double. When Bob Hughes asked me for a piece
for the Arch Ensemble, I also had the idea that I
wanted to use a film, and that I wanted the film to
contain images, very abstract scenes that depicted
this strange preoccupation with the idea of model-
ing. Then, in order to make the scenes more mean-
ingful, I wrote the text, and then I decided to just
do them all at the same time—play the piece, show
the film, and talk.
Polansky: Did you make the film?
Rosenboom: I made it with George Manupelli—
whom I asked because he's such a great filmmaker,
and the kinds of scenes I wanted were well suited
to his camera technique. The text depicts a scene in

which there are three characters talking, two of them are the spirit characters, which represent the polar opposites of humanity—maleness/femaleness, hard/soft, etcetera. These characters further represent the polar aspects of a single consciousness to which humans have evolved after some cataclysmic event—be it natural or unnatural, we don't know—but a sort of cusp in catastrophe theory terms. These creatures are waking up, the first waking forms of this new evolutionary form. At first they're discussing the phenomenon of their own survival, and then they discover the double, and by this I mean all the forms of the double—the idea of humanity copying itself, the robotic forms (mechanistic synthetic copies), religious copies in the forms of inventions of gods that look like humans, the Don Juan (spirit) form—because I saw in the double a fundamental basis for the idea of modeling. They talk to the double, and the big question to them is, How in the world did *it* survive? For in *their* minds they created it. Did it have enough motivation to prepare for its own survival? The conversation goes on, the film happens, and the music, which is the model that I made, is underneath.

Feedback

Polansky: By reading your book, *Biofeedback and the Arts* [1976. Vancouver: A.R.C. Press], which is several years old, I had the feeling that in that period you had some concept of the artist as an evolutionary model for humanity.
Rosenboom: I saw the arts as a kind of science of intuitive thought. Artists can conceive of these radical approaches to evolutionary processes, and they are a certain natural and necessary part of evolution—artists are products of natural forces.
Polansky: It's not our fault we're here.
Rosenboom: Right. It's built in. I was very involved in the idea of the feedback model, and the notion that we could enhance our naturally self-organizing qualities by creating even more feedback paths than we already have, and this could lead to possibilities for global feedback.

I saw the idea of monitoring the brain state of an individual, and making that audible, and making

that something that organizes musical form, as a model for the notion that humanity must evolve in order to survive itself and what it's doing to Earth. [Humanity] must evolve to a state of consciousness in which it conceives of itself as a single organism that lives on the Earth. Of course, it's politically naive and can be criticized on the same basis that everybody tore down Buckminster Fuller, but at the same time these things are worth pursuing, worth educating people to think about.

On Being Invisible, which is perhaps the most elaborate of all the feedback pieces that I did, deals with the evolution of a system, of which the person is a part, that goes through its own tendencies toward and away from order. It begins from either precomposed order or from a stochastic, randomly generated beginning. Because the natural shifts of attention that the person goes through, or volitionally manipulates, sensed by the computer measurement of brain signals, organize the musical form. Other pieces were generated collaboratively, like some of the pieces of the Maple Sugar group in Toronto that we were a part of, which were really involved with the view of artists in their surroundings—artists as creatures of social context, and how a group can work as a group.

Virtuosity

Polansky: It seems that a common thread in your work is the use of a very interesting idea of virtuosity, whether it's in the use of high-speed machines capable of complex decisions to restructure your own thought processes, or other performers who can make almost unhumanly quick and complex decisions. People like [pianist and composer] J. B. Floyd, or [master mridangam player] Trichy Sankaran, people who can do things almost on the order of machines, stretching motor and physiological limits.
Rosenboom: The reason is that these people tend to assume consciousness of a number of higher levels of the organization of the music they create. The ability to give the "go" signal to a generative system that's in your brain that goes to your arm that makes something happen almost without

thinking, is somehow correlated with the ability to think in real time on rather high levels of musical information. Sankaran is particularly amazing in this. He's kind of like a high-speed correlation computer, in that he can sense the tiniest rhythmic suggestion and build a huge rhythmic composition on it immediately with his drumming technique. That's something that Richard Teitelbaum exploited in one of his brainwave pieces with Sankaran and Barbara Mayfield (who did Tai Chi). Sankaran would hear patterns in Barbara's brainwaves, and he would instantly mushroom them into fantastic rhythmic ideas.

Computer Instruments

Polansky: Since a lot of your work has been in either practical or conceptual instrument design, you've been interested in the development of unusually complex interactions between yourself and the machine. The newest of these experiments is the Touché keyboard instrument, and your computer language Foil [Far Out Instrument Language]. Would you talk about these a little?

Rosenboom: The Touché is an instrument created in collaboration with Don Buchla. It was conceived as a keyboard-performance tool that would eventually allow for the implementation of real-time algorithmic composition, and which would also contain some of the more interesting advances of computer synthesis in a portable package that could be taken on stage. It consists of three special-purpose processors: one for digitally generating waveforms, one for controlling the slower-moving musical parameters in an analog manner, and one for making the stimulus/response mapping of the system between the inputs and the outputs. The software is Foil. Foil is based on the notion of *instrument definition*, a package of data that at any one time completely describes the stimulus/response characteristics of the instrument and all of its time-varying functions. One can have a library of these, available for instant access, and also edit and load them. I'm currently working on some enhancements of this as well—to make it run faster, and also to make possible the real-time al-

gorithmic composition in which the performance execution routines will be linked to a "metacompiler." One can then experiment with language structures by entering syntactically based descriptions of languages, and then use these languages to make music. (This will be written with the aid of a compiler called Meta 3.)

Concept Spaces

Polansky: Two things you have talked about a lot lately are the development of formal languages and the idea of concept spaces.

Rosenboom: *Concept spaces* result from another consistency in my compositions. I'm always making representations of multidimensional spaces in which I consider the elements of a given universe (piece) to be related. They're related by their closeness in that space in some way. There's a piece that I wrote for percussionists Alan O'Connor and William Youhass in 1966, when I was very involved in proportional relationships in music, that involved relating everything to long time units. I would, for instance, take the length of a piece as a fundamental and then, by dividing it up "ad absurdum," derive everything else in the piece—including the color of the lights in the hall. Not that I thought that this relationship would be necessarily organic or perceivable, but I used it to build a unifying model. In that space, I worked with spatial mappings of rhythmic ratios, and I worked out a set of compositional invariants, in the serial sense, that appeared in the form of sets of simple ratios and additive sequences.

Polansky: What was the name of that piece?

Rosenboom: It was taken from a distortion of a line from an e. e. cummings poem, "The Thud, Thud, Thud of Suffocating Blackness." It was a very bombastic piece, was dedicated to Ornette Coleman, and I thought I was making a political statement about racism. I think I may change the title. Another piece that I did in Buffalo [1967] for Lucas Foss's group was one where I made a circular mapping of parametric opposites, and the musicians had to relate to each other through that. The score was composed of a set of symbols that had a dictionary

of specific performance actions. That was actually influenced by the semantic differential.

Polansky: The Osgood thing?

Rosenboom: Right, which I had studied in psychology classes at Illinois, because he was at Illinois. I got exposed to it through Kenneth Gaburo's class in systems theory there, which was a wonderful class.

Osgood's book [*The Measurement of Meaning*] is a good example of a concept space model, and I've been thinking about that ever since. As it's developed, it's proved to be such a useful tool that I think it can be built into formal languages, and of course appears in neurological modeling. I think of perception as a hierarchical system, but it's important to understand that it's fully parallel. That is, information on one level is available to all other levels, not just the next level up, which is a fundamentally different approach than the straightforward tree structure. But given that, the sensory mechanisms create some segmentation of the perceptual space, and those become elements. These are mapped into a higher-level space, which has a different set of axes. Once those are mapped, changes from one to another are contours in that space. Contours become recognized as features, and shapes in a space on that given level become points in the next-higher-level space. So the transformation from one shape to another becomes represented as a contour of points in a higher-level space. This continues to go up the feature-extraction ladder in the neurological mechanism.

These ideas have been useful to me compositionally. I'm interested in embedding such a structure in a compositional or an analytical language that has flexibility for users of the language, who can parameterize that space any way they want. This structure is fundamental to our perception and is therefore not stylistically based.

Recordings

Polansky: What about your latest record?

Rosenboom: I made a 45-RPM single, which was an electronic version of the University of Michigan fight song.

Polansky: Did they like it?

Rosenboom: They liked it! Talk about cultural discontinuity! Some producer had this idea to make this record when Michigan was going to play football in the Rose Bowl against UCLA. Somehow he heard my record [*Future Travel*], and he went to Jose Cruz (the producer of *Future Travel*) and asked him. At first I didn't want to do it, but then as a favor to Jose, who had been so generous in making *Future Travel*, I did it. It was a busy time for me, but I had a four-track and my instruments, so one Saturday afternoon I just made the piece. And they loved it. It came out on a 45 single and sold really well right away, and then they lost to UCLA! It's on the shelf now, but they'll probably bring it out again next year.

Polansky: Can you talk a little about *Future Travel* [reviewed in *Computer Music Journal* 7(1): 76–77]?

Rosenboom: *Future Travel* is made entirely on the Touché, with the exception of some percussion instruments here and there, and some violin and piano. The music is a result of the modeling process, once again from the "In the Beginning" series, and especially from a part of that process that deals with melody. A melody is represented there as simply a shape—a plot on a graph, which is applied to various pitch sets. These pitch sets come from that proportional idea I worked out. I made a program in which I could access different shapes and apply them to different pitch sets, causing them to be played in various proportional rhythmic relationships, in real time. That is, by touching a key, I would pick a fundamental, and all the pitch sets would be derived, in complex ways, from the undertone or overtone series of that. Then I would pick a shape by touching another key, and that would become a melody. I used rhythmic structures that consisted of cross rhythms based on irreducible ratios: 9/4, 7/6, etcetera, and I could stop and start these. I found that I could produce such a broad range of musics that had such a wide range of stylistic referents, that I was quite shocked. I could pick certain proportional sets that could produce a blues, or something I'd never heard before. I was so amazed that it worked that I decided that I would just go into the studio, and gamble that I could create bed tracks with this system that would suggest tunes to me, which I would then orchestrate

into pieces. It was a gamble, since the studio time was expensive, but I was pleased with the result. Kathy Morton, the recording engineer, was instrumental in making it work.

The Center for Contemporary Music

Polansky: The last thing I want to talk about is your current job as coordinator of the Mills College Center for Contemporary Music [CCM]. What kind of plans do you have there?

Rosenboom: The position is one of the most difficult jobs I've ever had, because there is such tremendous historical weight attached to the place. There have been so many incarnations (radically different aesthetics and styles) there. When you step into a situation like that, you have so many people to think about and so much to consider. I have basically tried to make the CCM a place where people could continue to experiment in as free a way as possible—with new aesthetics and new musical styles—and to try to substantiate the studios and enhance the facilities. There's always been experimentation with electronic media, and I've tried to find ways to continue that by keeping the CCM abreast of new developments and by finding ways that the Center could contribute in a unique way to the field. I wouldn't like it to become just another electronic or computer music studio. We've tried to figure out areas where we could do things that aren't being done other places.

Polansky: What are some of those areas?

Rosenboom: In particular, the development of an approach to languages for use in computer music systems, which you and I have both tried to think about, in a way that's quite distinct from what's happening in other computer music centers. That's well under way, moving the facilities in the direction of programmable media in general. We need to continue to substantiate the intense use that is made of advanced recording processes in the creation of pieces, and the CCM's relationships to other media, for example, video and film. Those are all more or less obvious. What's not so obvious are the things that one does to try and keep the Center alive by showing a variety of communities that it has value, to many different people and different ways of working. I think it's a free environment in

which people can keep experimenting. It's also a demanding environment, in that there's a certain expectation of quality, and of innovation. This we should continue to live up to. And there's an imperative that it continue to support the experimental music community. It's fundamental that it remain experimental, and I believe that it has, which makes it an exciting place to work—a place where people don't have to worry about whether their work will be accepted or not—that is, provided they're serious. So that's what we're trying to do, and in that respect we're trying to continue a performance program that presents both new names in music and experimental directions, and also some "landmarks" that we're interested in, including those that haven't been too well exposed on the West Coast.

Polansky: Like Xenakis, and Salvatore Martirano?

Rosenboom: Right, and also support young artists who aren't that well known yet.

Polansky: What do you see as the future of the CCM? Are there any major projects or changes you'd like to make?

Rosenboom: Well, I'd like to reorganize and update the studios and get the performance program to be a little more self-producing. I'd like to recruit even more students. We have a great group of students there now, but we can handle more. I'd like to continue to develop positive and productive interfaces with other parts of Mills College—the other arts departments, computer science, and other disciplines. I'd like to continue to see the Public Access program thrive as an important part of the community, and I'd like it to be a strong archival center for documentation and recordings about experimental music.

Discography

Brainwave Music. A.R.C. Records 1002.
Suitable for Framing, with J. B. Floyd and Trichy Sankaran. A.R.C. Records 1000.
On Being Invisible. Music Gallery Editions Records, Vol. 4.
My New Music. J. Jasmine (Jacqueline Humbert and David Rosenboom). A.R.C. Records.
And out come the night ears, with Don Buchla. 1750 Arch Street Records 1774.
Future Travel. Street Records SRA-002.