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Computers Add New Dimension To Music

By ANN AMIOKA

Take a sound, any sound. Multiply it a dozen or more times to create a choral effect. Make the sound "fly" around the room in a dozen different directions and in as many speeds.

A computer at the Stanford Artificial Intelligence Center has been programmed to do these things and more as part of a computer music project being worked on by five University musicians (all either play an instrument or compose music).

The researchers are John M. Chowning, former assistant professor of music here, now composer in residence for Berlin, Germany; Music Prof. Leland Smith; Loren Rush, a composer who received his doctor of music arts degree here in 1969; Andy Moorer, a computer science doctoral candidate; and John M. Grey, a psychology doctoral candidate.

Although the computer can reproduce exactly the sounds of real instruments, its greatest potential lies in creating new sounds, according to Moorer and Grey.

Creating new sounds from old ones has been "a musical tradition ever since the tape recorder," observed Grey.

Spatial Choreography

One of the new sounds involves what Morer and Grey call "spatial choreography" — creating the illusion of moving sounds. In a sample recording, the listener can almost "see" a sound whiz across the room. A more elaborate recording sends 13 gongs of varying pitches whirling around the listener's head.

In another piece, a single note sung by a soprano is multiplied to produce a choral effect, flung around the room like angels' voices and finally blended with notes from a trombone.

"We haven't gone as far with the voice as we'd like to," Moorer commented.

Moorer and Grey emphasized that the computer will not take over the roles of performers or composers. The computer is "more of an extension that will aid both performers and composers," Grey said.

Computer Composers?

Other computer music projects have concerned programming computers to compose music. But Grey added that "we have no feeling that the computer will be capable of composing."

Computer music is "a reflection of whoever the composer is," Moorer remarked.

The composer chooses both the sounds and the instruments of his orchestra by typing the appropriate information into the computer. The computer then becomes "a medium for the expression of the composer's ideas in sound," said Grey.

Fears that computer music will be "highly academic" are "clearly silly," Moorer stated. He pointed out that another electronic instrument, the synthesizer, is being used by many pop rock groups and that the Grateful Dead already use a computer onstage.

'Laboratory Thing'

Computer music may be a "laboratory thing" now but in five to 10 years, Moorer predicted, it will be a suitcase-size "performing stage popular instrument." The computer as a musical instrument could eventually "find its way into everyone's home," Grey added.

Outside of music, the computer can be used in sound analyzing experiments, psycho-acoustic experiments, and electrical engineering experiments, said Moorer and Grey.

On a "very, very far out and tentative level," Grey said, sleep researcher Prof. William Dement may use the computer to produce sounds that might help people go to sleep (the sound of the sea, for example).

The group tries to keep in touch with some of the other major computer music project sites. These include Bell Laboratories, Colgate University, Massachusetts Institute of Technology (MIT), the University of Illinois, and Michigan State University.

International Center

The researchers are trying to raise funds to establish a $600,000 international computer music center here. According to Moorer, the group must raise $120,000 in outside donations in order to receive an equal grant from the National Endowment for the Arts (NEA). The National Science Foundation will supply the remainder once the NEA matches the $120,000.

The University approves the project, but provides no financial support, Moorer said. The General Secretary's Office is helping the group look for outside donors, Moorer added.

Popular rock groups don't have enough money to provide any funding, but bands like the Grateful Dead do have a "tremendous interest" in the activities of the computer music project, noted Moorer.

"They are eager to reap the fruits of our research," he said.

Establishing a separate system for the computer music project is important, according to Grey and Moorer, because it is a heavy burden on an already overworked system. The computer music project shares a system with 110 others at the Artificial Intelligence Center.

If a computer music center is established here, it will probably work closely with an institute for research in music and acoustics scheduled to be set up in Paris in 1976.

The researchers are also planning to give some public concerts this spring.