STUDIO REPORT for
THE CENTER FOR COMPUTER MUSIC at BROOKLYN COLLEGE

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ABSTRACT

The central goal of this Center is to provide access for a wide variety of composers seeking to process and synthesize sound using a high quality computer facility. One of the most important areas of achievement at the Center in recent years has been in the success of the compositions produced by composers working at the facility.

INTRODUCTION

The Center for Computer Music was established in 1977 by Charles Dodge. It is set in the context of the Conservatory of Music at Brooklyn College. As there is no engineering school at the College the Center cannot support technical research as is found in many large computer music facilities. Rather we provide an environment that has a uniquely musical focus. It is our hope to make available a high quality direct digital synthesis environment to composition students and visiting professionals for the development and realization of their musical ideas.

The presence of this facility in the context of New York's environment of intense new music activity has the effect of drawing together a highly accomplished and very diverse group of composers to work on computer music. The Campus of Brooklyn College, located about one hour's ride by subway from midtown Manhattan, provides a quiet setting for the Center. The facilities, including a main studio, terminal room and machine room are located in the Gershwin music building. Other facilities of the Conservatory of Music include the new Levinson Recital Hall and Whitman Hall for formal concerts.

CURRENT FACILITIES

Hardware

The facilities for direct digital synthesis at bc-cem are based on a Sun 3/160 workstation with 16 MBytes RAM and a floating point accelerator. This services a Sun 3/50 diskless workstation with floating point co-processor and up to ten student terminals. For on-line 16-bit sound conversion we are using the Digisound-16 by Micro Technology Unlimited. For external disk storage we have two CDC Sanyo/850 SMD drives and a Micropolis SCSI drive totaling nearly 2 GBytes of space for sound and text files. Other external devices include a laser printer, 1/4" SCSI and streaming
tape drives.

For sound recording and playback the Studio is equipped with a Soundcraft 600 series 16x8 mixer, Otari MX 5050 1/4" tape recorder, Sony PCM-701 with a Sony Betamax video recorder, Sony WR-11 and TC-D5 cassette recorders and UREI 839 monitor speakers.

Software for Digital Synthesis and Composition

The bulk of sound design at the Center is performed through the Casound audio processing package created at M.I.T. by Barry Vercoe. We also use Cnix by Paul Lansky at Princeton University and portions of the Carl software package from U.C.S.D. Some of these packages have been altered slightly for our system to make them read and write in the same soundfile format and make the same assumptions about our user’s environments.

In the course of our computer music curriculum we use the Score-11 program by Alexander Brinkman and our own "Promp" fractal composition environment designed by Curtis Bahn and David Aronovitch with the help of Dr. James Pritchett. Students also develop their own compositional algorithms, primarily in the C language.

ACTIVITIES

Musical Activities 1988 - 1989

The primary focus of our center is to provide composers the facilities for refining their musical ideas through computer music. Each year we serve a community of approximately 10 undergraduate students, 5 graduate students, 3 visiting composers and 10 summer visiting composers. In-house activities this year have included the beginning of a new work by Charles Dodge and the completion of a number of new works by graduate students and staff. One of the most important areas of achievement at the Center in recent years has been in the success of the compositions produced by composers working at the facility.

Charles Dodge is working on a large-scale new work through a Meet the Composer, Readers Digest grant. The work entitled, "Hoy, (In His Memory)," is a narrative symphony in the form of a radio play. This year he also prepared recordings of his works, "Roundelay" and "Any Resemblance is Purely Coincidental," for release on the Wergo "Digital Music Digital" CD series sponsored by Stanford University and the Systems Development Foundation.

Curtis Bahn completed a work for tape alone entitled "Cold Mountain." This piece uses a computer analysis of the pitches and durations of a recited Mandarin Chinese text to generate the musical material for the entire piece. The work received one of the 1989 ASCAP Awards to Young Composers.

Frances White who last year completed her Masters degree in composition in the Conservatory completed a new work involving speech analysis/synthesis techniques and complex filtering. The piece is entitled "Valbardia" and is based on a section from the Italian text of Italo Calvino’s "Invisible Cities."
Her piece "Ogni Peniero Vola," completed at the center in 1986 will also be included on the Wergo "Digital Music Digital" cd series.

Visiting Composer Project

Each year we offer our facilities free of charge to a few visiting composers. This has resulted in the creation of a group of most diverse computer music compositions which have been performed, literally, throughout the world. The system has been found by a number of very different composers to be well-suited for realizing their musical ideas. We accept applications for projects at the beginning of each academic year. Past visiting composers have included John Cage, Sten Hanson, Reynold Weidenaar, Judy Klein, Larry Austin, David Olan, Richard Kostelanetz, and others. Some activities by our visitors this year are as follows:

Andrea Szigtavari from the Institute of Musicology of the Academy of Sciences in Budapest visited us for several months this year to study computer music in order to take that expertise back to Hungary where she teaches computer music and is helping to establish the first computer music facility in that country. While she was working at our facility she completed a composition employing LPC speech analysis/synthesis techniques entitled "What's Wrong if Lilacs Love Moonlight."

Visiting composer David Arzoumian has completed a new work for tape alone entitled "One." Named for a painting by Jackson Pollack, the composition was generated by the composer's own computer-aided composition software and based on concepts of fractal geometry. The overall structure of the composition embodies a continuum from individually distinguishable foreground events to the creation of a single complex timbre.

Visiting Composer Harris Skibell newly arrived in New York from Austin, Texas, created a composition through a grant by New American Radio for live violin and sounds of the stock exchange. The piece entitled "Exchange" will be recorded by violinist Rolf Schulte and presented on National Public Radio this season.

ACADEMIC ACTIVITIES

Classes in Computer Music

The Conservatory of Music at Brooklyn College offers a two semester course in computer music taught by Charles Dodge. The course follows his book, "Computer Music, Synthesis Composition and Performance," coauthored with Thomas A. Jerse. Topics include:
• Digital Audio and Direct Digital Synthesis
• Musical Acoustics and Psycho Acoustics
• Additive and Subtractive Synthesis
• FM Synthesis
• Speech Synthesis and Cross Synthesis
• Linear Predictive Coding and Phase Voicing
• Reverberation and Sound Localization
• Computer-Aided Composition and Musical Fractals

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A number of advanced students study composition privately with Charles Dodge. This year and in the past we have had grants to involve graduate students in research topics such as the development of software for computer aided composition or other applications. Graduate degrees in music composition and performance are available through the Conservatory and the Graduate Center of the City University of New York (CUNY).

Summer Course in Computer Music

Each summer an intensive computer music course is held at the Center. It is taught by Charles Dodge with close personal assistance by staff and graduate students. The summer workshop participants cover the same ground as that covered during the yearly course. Guest lectures are a feature of the summer workshop and have included presentations by Max Matthews, Jean-Claude Risset, Johan Sundberg, John Crowning, Barry Vercoe, Paul Lansky, Jon Appleton, Tom Jerse, among others. The Workshop is attended by professional composers, college faculty, graduate and undergraduate composition students.

SUMMARY

Future Plans

This year we hope to expand our local network for direct digital synthesis with several Next machines. We also will be augmenting a Macintosh-based real-time system with several pieces of hardware donated by the Yamaha corporation. Professor Gary Nelson of Oberlin College among others will be in residence this year.

Conclusion

The Center for Computer Music is living proof that a computer music center can survive and thrive on a relatively modest budget outside an engineering environment. Recently, the availability of powerful robust computer systems like the SUN, and NEXT in combination with either “built-in” or “off the shelf” hardware for conversion have made this task much easier. The new generation of programs for synthesis and sound processing written in C have made the task of debugging code and modifying it to our local site much easier than in the days of Music11 and pdp11 assembly code. Thanks to these recent advances we look forward to spending a good deal more time at the Center focusing on musical issues than was ever possible in the past.