STUDIOS FOR SOUND, TECHNOLOGY & RESEARCH, UNIVERSITY OF MINNESOTA

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ABSTRACT

Since September 2002, the Studios for Sound, Technology and Research at the University of Minnesota (STRUM) have been fundamentally redesigned under the leadership of new faculty and administration. The facilities are still under development, and faculty are preparing (after the arrival of our new senior faculty composer, not yet announced as of this writing) to engage in a redesign of curriculum leading to introduction of a graduate degree in computer music.

1. INTRODUCTION

The STRUM studios are housed within Ferguson Hall, home to the School of Music on the Minneapolis campus of the University of Minnesota (USA), a research institution and one of the largest universities in the United States. The School of Music serves over 650 undergraduate and graduate students, fifty full-time and forty part-time faculty. The School of Music has a fine tradition as a center of performance and composition, but has only recently become a center of electroacoustic composition.

2. PERSONNEL

With the hire of Douglas Geers in 2002 as a new assistant professor of composition and Director of the STRUM studios, the University of Minnesota School of Music embarked in a new direction. Before this hire, the School's electroacoustic music hardware, software, and course offerings were minimal. Upon his arrival, Geers began to upgrade facilities, build a curriculum, and present events featuring internationally known composers (see below under "Events"). The School has subsequently hired electroacoustic composer and researcher Noel Zahler as Director of the School and Professor of composition, and is currently (as of this writing) in the final stages of a search for a third new faculty composer, a full professor who is also a specialist in computer music. Moreover, it is possible that one or more other computer musicians will join the School of Music faculty during the next year as part of cluster hire of interdisciplinary artists by the College of Liberal Arts.

The faculty are assisted by School of music technical and administrative staff, including the College of Liberal Arts (CLA) IT staff, two audio engineers, two CLA IT fellows, as well as a number of graduate student assistants. Faculty are also pursuing collaborations with other departments, including Art, Dance, Theater, Engineering, Psychology, and Computer Science.

Students from across the university participate in STRUM activities and classes. Of these, the core constituency is the population of graduate student composition majors, currently numbering twenty-two. The composition major at our institution is only offered at the graduate level, and thus all classes can confidently reach to high conceptual and technical levels.

3. CREATIVE/RESEARCH/PEDAGOGICAL VISION

The intent of the new STRUM configuration and plans for future growth are to develop an environment where both faculty and students have the tools and a community of colleagues that promote composition and research in the electroacoustic medium. Our goal is to foster bold but informed creativity. As such, we are in the process of redesigning the curriculum of our graduate degrees, and are interested to add a computer music degree to the program in upcoming years. One particular area of our interest is to bring together composers/artists and scientists to work on joint projects, so that artistic and scientific ideas can inform and benefit one another. Another focus will be to encourage multimedia collaborations, especially between composers and artists working in the "Time and Interactivity" area of the nearby Art department, as well as others across the "Arts Quarter" (see 5.3 below).
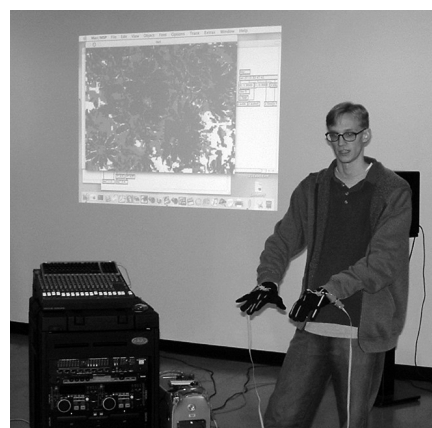

Fig. 1: Demonstration of custom controller gloves.

Current and upcoming course offerings include: Introduction to Computer Music, Advanced Computer Music, Digital Sound Synthesis and Processing, Algorithmic Composition, History and Literature of Electronic and Computer Music, Interactive Systems, Electroacoustic Performance, Music Technology and Culture, Music Notation via Computer, MIDI Music

Systems, and Interdisciplinary Collaborations. In addition, related courses on topics ranging from computer science to psychoacoustics to cultural studies are available through other departments within the university. As mentioned above, our curriculum is slated for revision and expansion once new faculty is in place (fall 2005). In addition, faculty are pursuing programmatic connections with other prominent computer music centers, including IRCAM.

4. EVENTS

4.1. Livewire Concert Series

Fig. 2: Concert performance, 2004.

STRUM presents a number of events both on- and off-campus each academic year, including the Livewire concert series. These concerts feature works by faculty, students, and guest artists, and happen either in Lloyd Ultan Recital Hall or the Coffman Whole (see "Facilities" below). Guest composers for these concerts generally spend a multi-day residency at the School of Music, presenting lectures and master classes in addition to the concert. Recent guests include Philippe Manoury, Paul Lansky, Jøran Rudi, Judith Shatin, Jon Christopher Nelson, and Brad Garton.

4.2. Spark Festival of Electronic Music and Art

Founded in 2003 by Douglas Geers, the Spark Festival of Electronic Music and Art is an annual event showcasing excellent digital music and art from around the world. The intent of Spark is to present a panorama of activity, including works in genres traditionally considered "academic" as well as not. For example, Spark events have included chamber music recitals, big band concerts, video screenings, electronic improvisations in clubs and bars, and dance performances (including a fire dancer in 2004, as seen in Figure 3 below).

To give an impression of the breadth of activity, here is a summary of Spark 2005, which happened from February 16-20. These five days featured guest composer Philippe Manoury, who presented his music in concert, lectured on his work, and held a master class. Another special guest of Spark 2005 was writer-musician-artist DJ Spooky (a.k.a. That Submliminal Kid), who gave a multimedia presentation entitled "Rhythm Science" to hundreds of students and community members in the Coffman Union Theater.

Beyond these two featured guests, Spark 2005 also included interactive installations and two video performances in the Frederic Weisman Art Museum, an installation in the School of Music lobby, four electroacoustic concerts in the Ted Mann Concert Hall and Lloyd Ultan Recital Hall, two 8.1 electroaoustic concerts in the Regis Art Center's Influx Auditorium, one concert in the Coffman Whole club, three nights of multiple performance sets in the Town Hall, a brew pub adjacent to campus, and twenty scholarly papers given on topics of electroacoustic music and interactive digital art. Artists, musicians and scholars who participated hailed from around the globe, including Sweden, Germany, France, Italy, the Netherlands, Ireland, England, Croatia, China, Japan, Taiwan, Brazil, Canada, and the USA.

Performers at Spark 2005 included the NeXT Ens, clarinetist Esther Lamneck, cellist Urich Maiss, flutist Elizabeth McNutt, clarinetist Patrick O'Keefe, pianist Shannon Wettstein, pianist Shiau-uen Ding, saxophonist C.R. Kasprzyk, flutist Elizabeth Marshall, and others, including numerous composer-performers.

The complete published program for Spark 2005, including a PDF containing the complete texts of all of the papers delivered, is available online at http://spark.cla.umn.edu. This site also includes information and the call for works and papers for Spark 2006, which will happen February 22-26.

Fig. 3: Performance at Spark 2004.

4.3. Arts Quarter Events

Over recent years, the University of Minnesota has organized its departments of music, art, theatre, and dance into a pan-departmental entity known as the Arts Quarter. Aided by the geographic location of these departments adjacent to each other, the Arts Quarter encourages cross-disciplinary creation of all kinds. Several Arts Quarter events happen every year, including an Arts Quarter Weekend each autumn and others scattered through the academic year; and

electroacoustic music has become a primary component of many works presented at them.

The Arts Quarter will also soon host degree programs in Interdisciplinary Arts, and searches are currently open for six new tenured or tenure track faculty (open rank search) in collaborative and interdisciplinary arts, with hires to be completed in Spring 2006. The program seeks artists and researchers whose work is inherently interdisciplinary or highly collaborative, and artists and scholars working in all media, including technology-centric genres, are invited to apply. Please see www.umn.edu for more information.

5. RESEARCH ACTIVITIES

In addition to the activities mentioned above, STRUM denizens have also pursued varied research projects: Professor Noel Zahler has developed synthetic performers, including an eight-channel spatialization instrument used in his 2003 clarinet concerto. Assistant Professor Doug Geers has studied electroacoustic performance (including both instrument creation and cultural issues of contemporary electronic music), therapeutic use of auditory display, and algorithmic composition. Ph.D. student J. Anthony Allen has created a number of interactive instruments and has studied the formalized development timbre in electroacoustic works. M.F.A. student Christopher Baker has studied visual tracking of dance and the use of data acquired from wireless networks within installations and performances. M.A. student Michael Berkowski has created haptic instruments and investigated composition with genetic algorithms. M.A. student Joshua Clausen has created software instruments and studied the motivic use of rhythm in the music of Aphex Twin. Ph.D. student Zachary Crockett has studied visual tracking of dance and composition with genetic algorithms. M.A. student Noah Keesecker has designed haptic interfaces for acoustic instruments and algorithmic performance software. In addition, a number of other students have created interactive instruments, installations, and multimedia performance pieces.

6. FACILITIES

STRUM's physical space currently consists of nine facilities: Studio A, B, and C; the recording room; the music technology lab; the faculty media workroom; Lloyd Ultan Recital Hall; Ted Mann Concert Hall; and the Coffman Whole. STRUM faculty and students also have access to a number of installation and performance spaces in the new Regis Art Center and a number of TV/video studios in the Rarig building, across the street and adjacent to the School of Music building, respectively.

6.1. Studio A
This studio functions as classroom, composition studio, and recording studio control room, and contains three Macintosh workstations. Each of these is fitted with a MIDI keyboard, a number of other MIDI controllers (footpedal boards, fader boxes, dial boxes, Wacom tablets, and custom-built flex sensor gloves), and a variety of professional-level software for electroacoustic music composition, including *Max/MSP/Jitter*, *Digital Performer*, IRCAM Forum software, *Peak*, *Csound*, *Soundhack*, *Supercollider*, *Pluggo*, *Metasynth*, *Waves* plug-ins, and others. The main workstation is also equipped to simultaneously run Linux (Red Hat 9) and Windows XP operating systems from within Virtual PC on Mac OS X.

Fig. 4: Main workstation in STRUM Studio A.

Studio A contains a number of hardware devices including an ADAT, several audio processors, MIDI synthesizers, an HRI CD recorder, a 16x8x8 analog mixer, multiple Teleo systems, and, for inspiration and nostalgia, a Theremin, ARP 2600, and Electrocomp synthesizer. Audio projection is realized via an 8.1 speaker system and a pair of near-field monitors at the main station.

6.2. Studio B
Studio B is a single-user multimedia workstation, with both hardware and software for professional-level visual and audio media recording, composition/editing, and production (dual-processor Macintosh with software listed for Studio A plus VHS and mini-DV video decks, video montitor, mini-DV cameras, scanner, *Final Cut Pro*, *DVD Studio Pro*, Adobe *Photosuite*, etc.). This room has a 16x4 mixer and stereo sound.

6.3. Recording Room
This room, approximately 3.5x3.5 meters in size, serves as a live recording studio. It is fitted with acoustic reinforcement, a number of high quality microphones (Neumann, AKG, Earthworks, Blue, Shure), and a headphone monitoring system. The front wall of this room contains a large window, allowing a line of sight to the main workstation of Studio A, which serves as the recording workstation. This room is also connected via audio and Ethernet lines to both Studio A and Studio B.

6.4. Studio C

Studio C is a multi-use room designed for advanced users, post production, and interactive performance. It contains three Macintosh G5s (running the same software as in Studio A), a Linux PC (running Csound, Planet CCRMA software, and other shareware), and an 8.1 audio system. This room also has flexible table space for users with laptops and/or physical computing projects, a color laser printer, a CD/DVD printer, and a multiple CD/DVD burner.

6.5. Technology Lab

This classroom/lab contains twenty-seven newly purchased G5 iMac workstations, each fitted with a MIDI keyboard, synthesizer module, *Sibelius, Finale*, *Peak*, *Logic Express*, assorted pedagogical music theory software, Internet software, the Apple's *iLife* suite, and *Microsoft Office*. Ten of these stations are also loaded with SPSS statistical software, and others have *Max/MSP/Jitter* and *Digital Performer*. One workstation serves as a digitization station, with an attached VCR, cassette machine, and scanner for input of analog media and software to edit and process these. All workstations are networked and controllable from a faculty station at the front of the room.

6.6. Faculty Media Workroom

This room provides faculty with a variety of media services, from laser printing and photocopying to computer-based media creation. It features a photocopier, four HP laser printers (three black/white and one color), several formats of media playback for duplicating purposes (tape decks, VCRs, etc.), and an iMac workstation. The workstation has software for music notation and composition, a CD burner and *Toast* CD burning software, a scanner and *Photoshop* software, a VCR and cassette machine for digitization of analog audio and video, the Apple's *iLife*, *Peak* audio editing software, *Final Cut Pro* video editing software, *Logic Express* software, a MIDI keyboard and synthesizer.

Fig. 5: Performance in Lloyd Ultan Recital Hall, 2003.

6.7. Lloyd Ultan Recital Hall

Lloyd Ultan Recital Hall is a steep-raked performance space with seating for 160, located inside the School of Music. STRUM presents several concerts per semester in this hall and owns an 8.2 performance system for use there. This hall also features a back-of-hall recording booth with a line of sight to the stage that is able to record all events there to both video and audio (DAT and CD). Audio recording happens via a pair of hanging Neumann microphones.

6.8. Ted Mann Concert Hall

Ted Mann concert Hall is adjacent and connected to the School of Music. Built in 1993, this world-class concert auditorium seats 1250 and programs both School of Music events and outside artists (the St. Paul Chamber Orchestra is a regular tenant). This facility has a number of full-time technical and management staff, and a flexible, fully professional sound system that has been used for concerts by artists such as the Lincoln Center Jazz Orchestra, Bobby McFerrin, the Martha Graham Dance Company, and others. STRUM uses this space for special events, including some concerts of the annual Spark Festival (see "Events" above).

6.9. Coffman Whole

The Coffman Whole is a club-type performance space located in the Coffman Student Union. It features a small stage with theatrical lighting, stereo sound, a number of microphones, cabaret style seating, and a snack bar serving food and drinks. Several STRUM events have happened in the Whole since it opened after extensive remodeling in the spring of 2004, including concerts of the Livewire concert series and the Spark Festival.

7. FUNDING

8. ACKNOWLEDGEMENTS