THE ELECTRO-ACOUSTIC MUSIC CENTER AT THE UNIVERSITY OF WISCONSIN-MILWAUKEE

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ABSTRACT

This studio report introduces the Electro-Acoustic Music Center (EAMC) at the University of Wisconsin-Milwaukee (UWM). Recent developments at the EAMC include new faculty and staff, new studio facilities at Kenilworth Square East, support of the new Unruly Music concert series at UWM, and participation in a new undergraduate interdisciplinary arts technology program.

1. OVERVIEW

The Electro-Acoustic Music Center, founded by Jon Welstead in 1982, serves as a resource for research, education, and creative work in music technology in the Peck School of the Arts at the University of Wisconsin-Milwaukee (UWM). The EAMC facilitates a broad range of activities involving electroacoustic music, and works in cooperation with technology-minded practitioners in the Art, Dance, Film, and Theater departments in the Peck School. As part of a rich and diverse artistic environment, the EAMC has always emphasized interdisciplinarity, collaboration, and multimedia work.

2. PEOPLE

Jon Welstead is the head of the Music Composition & Technology area at UWM, the chair of the Music Department, and the founder of the EAMC. His creative and research interests include sensor and interface design (especially for the realtime control of multichannel sound diffusion), and the transformation and abstraction of recorded sound. His teaching portfolio includes courses involving audio editing and manipulation, analog and digital synthesis techniques, and multichannel audio spatialization.

Christopher Burns serves as the director of the EAMC. His research interests include algorithmic composition, the development of software environments for laptop improvisation, idiosyncratic synthesis techniques (especially involving feedback networks), and the reconstruction of classic live electroacoustic music. His teaching portfolio includes synthesis techniques, algorithmic composition, and programming for interactive applications. Recent works include the Kepler's Monsters, Periodic Table, and Pipe Dream laptop improvisation environments, algorithmic instrumental compositions Windwork and Tangle, a sound installation titled Quartet, and interactive music for Luc Vanier's Somewhere choreography.

EAMC technical director Kevin Schlei's creative and research interests include multimedia, instrument and interaction design, and collaborative projects with film, theater, and dance. His teaching portfolio includes introductory work with MIDI and audio composition, and synthesis applications. Recent compositions include Four Pillars - Fractal Construction no. 2, an algorithmic composition for orchestra, an electroacoustic multimedia performance titled Drop, and a multimedia work titled Irradiance.

Figure 1. Rehearsal for Kevin Schlei's Irradiance.

Other composition faculty at UWM affiliated with the center include Keith Carpenter, Bill Heinrichs, Jonathan Monhardt, Steve Nelson-Raney, and Steve Schlei. Composition graduate students working extensively at the EAMC include Jeff Klatt, Adam Murphy, and Jerod Sommerfeldt. The EAMC also welcomes graduate students from outside of the Composition and Technology area; recently affiliated graduate students from other areas of the Peck School of the Arts include Jay Mollerov (MM, Guitar performance) and Brent Coughenour, Lilly Czarnecki, and David Dinnell (MFA, Film). Recent large-scale student projects include Brent Coughenour's multimedia improvisation environments, Dale Kaminiski's Speed of Light interactive multimedia performance, Adam Murphy's GRAINSPACE granular synthesis performance environment, and Greg Surges' Gates no. 1 feedback improvisation software.

3. FACILITIES

3.1. On-Campus Facilities

The EAMC maintains studios in two locations. Our teaching/undergraduate studios are located on-campus, in the Music Building. Our research/graduate studios are
part of the new off-campus Kenilworth Square East arts building, adjacent to labs and facilities staffed by other technology-minded artists from other disciplines at the Peck School of the Arts.

Our flagship Music Building spaces are a pair of surround production studios. Studio B40 features a reconfigurable surround setup with 8 Genelec 1032 monitors and 2 Genelec 1092A subwoofers; Studio B50 offers a 5.1 cinema surround setup with Genelec 1031A monitors and a Genelec 1092A subwoofer. Studio B50A is our analog synthesis studio, with an ARP 2500 modular synth (with a full array of components) and two Korg MS-20s. Studio B60 is the largest of these four spaces, suitable for teaching, rehearsals, and small performances, with a 5.1 surround sound system based on classic Klipsch cabinet speakers. All four rooms feature recent-model Macintosh workstations with a full complement of audio and video production software.

Additional Music Building spaces include Room B31, our fabrication and maintenance shop, Room B40A, which provides several individual workstations for student projects, and Room 270, which features a cluster of twenty keyboard-equipped workstations for classroom and individual use. Our Recital Hall is newly equipped with a permanently-installed eight-channel surround system (with Bag End loudspeakers) for rehearsals and concerts requiring amplification. A matching portable eight-channel PA system allows us to set up sixteen-channel configurations, BEAST-style acousmatic configurations, or other idiosyncratic layouts in the Recital Hall. We also use the portable system for diffusion setups in other venues on- and off-campus; we’ve set up this system in our orchestra-sized Helen Bader Concert Hall with good results.

### 3.2. Kenilworth Square East Facilities

In November 2006, we inaugurated new studio spaces at Kenilworth Square East, a Peck School of the Arts research facility emphasizing arts technology projects and programs. The Composition & Technology Lab (KSE592) provides a flexible, multipurpose space for recording, rehearsal, installation, and teaching. In the past few months it has been used to set up and test sound and multimedia installation pieces, for music rehearsals, for informal performances, and for the recording of both spoken-word and musical performances. The Lab is a highly functional recording environment, with cable passthroughs and an insulated window to the adjacent Recording Control Room. It also allows us to set up and test complex configurations of equipment (with any noise-emitting gear isolated in the adjacent Fabrication Lab). A ceiling-mounted pipe grid also enables us to design and hang unusual loudspeaker configurations, microphones, and other equipment as desired.

The Recording Control Room (KSE 595) is one of two critical listening spaces, with excellent acoustic isolation as well as visual and cable connections to both the Composition & Technology Lab and the Guitar program’s Ensemble Room. Recording performances from both of these spaces is a major application for Control Room, with other kinds of audiovisual production, editing, and mastering work also supported. Our second premier critical listening environment is the Audio Mastering Room (KSE 581), which features a 5.1 monitoring system using Mackie HR824s. Students and faculty develop, consider, and critique composition, multimedia, and sound art projects in this space.

The Fabrication Lab (KSE 592A) is our workspace for hardware hacking, circuit bending, cable manufacture, and electronics repair. If it involves getting our hands dirty, this is where we do it! The Fabrication Lab also serves as storage and organization for equipment and cables which are not permanently installed, and in the future will function as a server room for networked file storage and Internet-facing projects. Cable passthroughs to all of the studio spaces (KSE 581, KSE 592, KSE 595) will allow us to remote all of our computer workstations and other noise-producing equipment to the Fabrication Lab for acoustic purposes.

The Kenilworth building also provides faculty studios and shared graduate student workspaces for the EAMC, all located in close proximity to the studios so as to encourage communication, foster collaboration, and build community. The 802.11g wireless network assures that any UWM artist with a laptop can immediately be connected to the campus network and its resources. In addition to the lab and studio spaces designated for use by the EAMC, there are a number of shared facilities at Kenilworth, including a blackbox theater, a film screening room, gallery and exhibition areas, and dance and theater rehearsal spaces. Composition students also have access to a 5.1 surround audio/video production environment maintained by the Art department, and a motion capture studio maintained by the Dance department. UWM choreographer Luc Vanier’s recent *e’s of water* site-specific multimedia dance performance, encompassing spaces throughout the six floors of the Kenilworth building, suggests the breadth and depth of the artistic possibilities facilitated by this new space.

### 4. TEACHING

The twenty undergraduate Music Composition and Technology majors at UWM are expected to complete a four-semester sequence of courses offered by the EAMC, which gradually build from MIDI and sequencing applications to analog and digital synthesis, audio editing and manipulation, signal processing, and spatialization. Undergraduate applicants to the Composition and Technology program are expected to demonstrate some compositional work on entrance to the program, but are not required to have experience in electroacoustic music prior to their study at UWM.

The six members of the MM degree program in Music Composition are also expected to devote some of their time electroacoustic composition, and to participate in Center coursework. Graduate instruction through the EAMC is based primarily on a series of rotating “special topic” courses (also open to advanced undergraduates). Recent titles in this series of courses include "Interactivity and Improvisation," "Electronics in Performance," "Programming for Sound Synthesis," and "Algorithmic Composition."

In addition to coursework, both undergraduate and graduate students can choose to make electroacoustic
work a significant part of their individual composition tutorials. Recent graduates from the Composition and Technology programs have continued with graduate study in composition at other institutions, or have found work in the audio recording, production, or music publishing industries.

The EAMC also participates in the DIVAS (Digital Imaging, Visualization, Animation, and Sound) BFA program, an multimedia arts technology curriculum shared between the Art, Film, and Music Departments. DIVAS students have access to the full range of EAMC course offerings, and their presence in the EAMC classes helps to foster a spirit of interdisciplinarity and a continuing attention to the relationships between sound and other media. Recent DIVAS graduates have found careers in fields ranging from video post-production and graphic design to fashion design.

5. CONCERT PRODUCTION

The EAMC actively supports concert life at UWM and in Milwaukee. In 2006-2007, Christopher Burns launched a new concert series titled Unruly Music, presenting four guest artist performances at UWM each season. The EAMC provides technical support for these events: electroacoustic highlights from the first season included composer/oboeist Kyle Bruckmann's *Gasp and Fissures*, plus works for oboe and electronics by Mary Jane Leach and Luciano Berio, and pianist Christopher Jones' performance of Luigi Nono's *...soferte onde serene*.... The Unruly Music series also includes an annual ensemble residency, with UWM graduate student composers invited to write for a visiting ensemble of contemporary music specialists. The 2006-2007 residency featured two concerts by San Diego quartet NOISE, plus a variety of masterclasses, lecture-demonstrations, and open rehearsals.

The EAMC also produces semi-annual concerts (under the Unruly Music umbrella) devoted to electroacoustic music. Recent programs include *Electric Minimalism* (featuring works by György Ligeti, Alvin Lucier, Pauline Oliveros, and Steve Reich), *Surroundings* (multichannel tape music by Christopher Bailey, Elizabeth Hoffman, Sun-Juk Kim, Elainie Lillios, and Rob Mackay), *Caged Electroacoustic Retrospective* (an evening of John Cage works featuring electronics), and *Time Still: Past and Future* (with music by Cliff Caruthers, Luigi Nono, Howard Sandroff, and Jon Welstead).

There are also substantial opportunities for the performance of student compositions at UWM; every semester features both an instrumental/vocal concert (with occasional pieces of electroacoustic music) and an Electroacoustic Salon devoted exclusively to electronic sound and multimedia projects by students. Additionally, the EAMC provides technical support for performances sponsored elsewhere in the Peck School of the Arts; recent collaborators include Art (the *Cartune Xpres* screening and performance) and Dance (the 2006 *Winterdances* concerts) departments.

The EAMC’s latest venture into concert and performance activity is the creation of MiLO, the Milwaukee Laptop Orchestra. MiLO emphasizes collective improvisation and multimedia collaboration; our first two performances (in March and April 2007) have featured everything from live processing of saxophone and mandolin to circuit-bending of electronic toys to VJ performance with environmental footage from around Milwaukee. MiLO’s concert activities will continue throughout the summer and fall of 2007, including an October performance which will feature improvised accompaniment to a screening of Walter Ruttmann’s classic silent film *Berlin: Symphony of a Great City* (1927).

![Figure 2. Members of MiLO in rehearsal. From left: Steve Nelson-Raney, David Collins, Dale Kaminski, Steve Schlei, Brent Coughenour, and Adam Murphy.](image)

6. CONCLUSIONS

As we celebrate our 25th anniversary, the EAMC is growing rapidly, with an increasing student population in Composition & Technology and a new undergraduate program in interdisciplinary arts technology. We look forward to the next twenty-five years of research, teaching, creative work, and collaboration.