University of Helsinki Music Research Laboratory and Electronic Music Studio – A Studio Report

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Abstract

In 2001, the University of Helsinki Electronic Music Studio celebrated its 40 years of existence. Thus, it is the oldest still operational electronic music studios in the Nordic countries. In 1960’s and 1970’s, the University studio was one of the central facilities for Finnish avant-garde composers. However, since the mid 1980’s, the focus of the activities has shifted from electronic music composition to computer-based music research. Hence, the studio is now also called University of Helsinki Music Research Laboratory.

A short history

University of Helsinki Electronic Music Studio was founded by Erkki Kurenniemi in 1961. In the early 1960’s, the equipment consisted of conventional analog recording and synthesis equipment. Kurenniemi also built analog synthesis equipment, for example, for the Finnish avant-garde artist M.A. Numminen. In the late 1960’s, Kurenniemi began experimenting with digital electronics. In 1970 he built the DIMI-A, a compact size, all-digital, programmable synthesizer.

DIMI-A had two square wave tone generators, two 7-band filter banks, a signal input and a 256-step programmable sequencer holding up to a total of 100 parameter settings including tonal parameters, tempo changes and sequencer jump instruction. Two DIMI-A’s were manufactured, one for the University studio and the other for the Swedish composer Ralf Lundsten. The first unit, still in operational condition, is currently on display in the Helsinki Museum of Contemporary Art, but will be returned to the University studio in 2004. Between 1970 and 1975 Kurenniemi built a range of digital music instruments including the microprocessor-based, machine code programmable, modular synthesizer DIMI 6000, the video-controlled DIMI-O and the digital mixer DIMIX.

In 1970’s, the studio was maintained by Jukka Ruohomäki, who composed music using both Kurenniemi’s instruments and traditional analog equipment. Ruohomäki’s interest in computer graphics also made him one of the early pioneers of Finnish digital computer animation. In the early 1980’s, the premises of the Department of Musicology were repaired and the studio was moved to a temporary location. The studio was reconstructed by Andrew Bentley and in 1984 the studio was moved to its current location at Vironkatu 1. After a short return of Jukka Ruohomäki in 1984, the studio maintenance was taken over jointly by Pauli Laine and Kai Lassfolk. The latter is the current maintainer. Laine and Lassfolk directed the main activity from electronic music to research.

In the 1980’s, the computer equipment consisted of Apple IIs and Macintoshes. At the end of the decade, program development shifted from Apple IIs to MSDOS and PC-based Unix systems. In the early 1990’s, a system of several NeXT workstations were purchased. Also at the same time, access to the university local area network and broadband Internet access were acquired. The NeXT-based system remained the computing backbone nearly throughout the 1990’s. At the end of the decade, Linux was chosen as the primary operating system.

The current facilities

The studio occupies one of the four floors at to the Department of Musicology. The rooms consist of a recording room, two control rooms, a separate tape music studio, a service room, and an office. The individual rooms a relatively small but their amount is adequate for several concurrent activities including lectures and studio work.

The control room is equipped with an Eela Audio mixing console and a small selection of outboard equipment. A PC workstation is available for multitrack recording. The PC is equipped with Steinberg/RME Audio digital sound card and an 8-channel 96kHz/24-bit ADDA converter. Steinberg Nuendo is used as the primary recording and editing program. The PC can be also used as a Linux workstation, e.g., for running Csound or JMax.

The tape music studio provides a historic perspective for electronic music composition and education. The equipment is nearly all-analog including a set of two-track tape recorders, a Putney VCS-3 and a Roland System 100M synthesizer.
The rest of the rooms are equipped with Linux
PC workstations. They act as clients to a Linux file and
print server. The old NeXT workstation/server system
is still in operation, but used only occasionally. In
addition, Macintosh workstations are used for special-
ized tasks.

From the 1960’s throughout the 1980’s the studio
was maintained mainly by part-time or voluntary per-
sonnel. In 1995, the first full-time teaching position
was received. Currently, the staff consist of one full-
time and one part-time employee. The studio main-
tains a WWW site at http://www.music.helsinki.fi. It
contains course material (mainly in Finnish) and
downloadable software.

Research activities

Kurenniemi’s research in digital synthesis was fol-
lowed by software development projects by Andrew
Bentley, Pauli Laine and Kai Lassfolk, among others.
Bentley developed software for hybrid sound synthe-
thesis. A joint research project was conducted with prof.
Teuvo Kohonen’s laboratory at Helsinki University of
Technology. The project involved a musical application
of Kohonen’s Dynamically Expanding Context
system [2].

Jukka-Pekka Kervinen, Pauli Laine and Kai Lass-
folk wrote a composition toolkit for Apple II and later
for MSDOS. The system, called HUMAC, was the
starting point of several software development
projects including Laine’s and Kalev Tiits’ AGO for
MSDOS and Kervinen’s and Lassfolk’s Helsinki
Music Tools for Unix [1].

In 1994, experiments with Object-oriented pro-
gramming led to the development of Sound Process-
ing Kit, a signal processing framework first written in
Objective-C for NeXT computers [4]. SPKit was
rewritten in C++ and ported to other Unix-compatible
operating systems. SPKit is distributed under the Gnu
Library General Public License. From 1999 to 2001 a
research project on musical feedback was carried out.
Other research areas include algorithmic composition
systems [3], computer-based music notation, and
qualitative analysis of musical instrument tones.

Educational and musical activities

From the early years to the mid 1980’s, the teaching
concentrated on basic studio technology computer
music composition techniques. In the late 1980’s,
musicalological computer applications, such as com-
puter-assisted music analysis, became part of the course
repertoire. In 1993, a Master of Arts program in com-
puter-assisted music research was established. The
studio also offers courses for musicology students.
Also, computer-assisted music research can be stud-
ied as a minor subject by students of other faculties
and universities. As a result, the student base is heter-
ogeneous including people from musicology, com-
puter science, acoustics, etc.

The M.A. program includes courses on musical
acoustics, recording techniques, electro-acoustic
music, musical application programming and sem-
nars on computer-based music research. The students
may specialize, for example, in computer-based music
analysis, algorithmic composition or audio signal
processing.

The studio has arranged occasional concerts pre-
senting the works of it’s composers. Also, works of
other composers have been performed. For example in
1999, Kaija Saariaho’s Lonh for soprano and electron-
cics was performed at the Helsinki Musica Nova festi-
val. The next concert, planned for fall 2002, will cele-
brate the first 40 years of the studio.

Recently, the studio has experienced a revival of
traditional analog tape music techniques as well as a
renewed interest in Kurenniemi’s work. However,
computer-based research will remain the principal
activity of the studio.

Conclusion

During its existence, The University of Helsinki Elec-
tronic Music Studio has experienced the shift from
analog to digital equipment but retained some of the
now historic devices in active use. The studio has also
played an active role in the development of electronic
music instruments and computer software. Although
the current emphasis of its activities is on education
and research, the studio still provides facilities for
electronic music composers.

References

Tools. Proceedings of the 1993 International
Computer Music Conference. The International
Computer Music Association, Tokyo, Japan, pp.

Nonheuristic Automatic Composition Method.
Music and Connectionism, P. Todd and G. Loy
(ed.). MIT Press, Cambridge, Massachusetts,

Motion Patterns. Ph.D. dissertation. The Finnish

Oriented Signal Processing Framework. Proceed-
ings of the 1999 International Computer Music
Conference. The International Computer Music
Association, Beijing, China, 1999.