DIEM
The Danish Institute of Electroacoustic Music

Studio Report
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Abstract
DIEM, The Danish Institute of Electroacoustic Music, is Denmark’s national center of electroacoustic music. DIEM is an independent, non-profit organization whose purpose it is to assist in the production, teaching, research and performance of all styles and forms of electroacoustic music in Denmark. The institution is funded by the Danish Ministry of Culture. The staff includes an artistic and administrative director, two audio technicians, a software coordinator and a secretary. This report is a description of the facilities and recent activities that have taken place at DIEM.

1 Location
The institution is housed in the concert center of Denmark’s second largest city, Aarhus. The decision to place the studio in Aarhus rather than Copenhagen was made for two reasons: 1) the concert center had already installed a complete 24-track recording studio which had unused capacity and 2) Aarhus is a culturally active city with a strong contemporary music tradition. The concert center, consisting of a symphony hall as well as a chamber music hall, is owned and operated by the city of Aarhus. DIEM, which is a national institution, is leasing space from the concert hall. The center also houses the Aarhus Symphony Orchestra and the Danish National Opera. The studio itself consists of two rooms, 60 square meters each, which were designed and constructed as a recording studio and control room when the concert hall was built in 1982.

2 Equipment
In July, 1993 the main recording studio was redesigned and most of the equipment replaced to provide fully automated and completely digital mixing and recording facilties. The new mixer is a Yamaha DMC 1000 digital mixing console with 22 inputs, 8 digital outputs and complete automation. Connected to the console are two multitrack hard disk recording systems, an Audio Frame workstation with 8 channels of hard disk recording as well as 32 additional channels of automated mixing and a Digidesign ProTools 8 track hard disk recording system. This system is integrated with a number of stereo DAT mastering tape recordings and can be controlled from a central computer, a Macintosh II fx with 20 Mb RAM and two 1.2 Gb hard disks. A NoXt cube with a wide variety of software for synthesis, analysis and processing as well as numerous MIDI synthesizers and effects units are also available. Studio II consists of a 16 channel mixer, a Macintosh computer with Sound Tools and Sampler cells and a number of synthesizers. There are direct audio links with both concert halls for live recording and playback. In addition DIEM has a powerful four channel Delphi F-2 sound system with subswoofers used for indoor and outdoor concerts with electroacoustic music.

3 Tape Music Productions
Studio time is made available to composers of all types of electroacoustic music regardless of their artistic background or stylistic orientation and there is no charge for working in the studio. For most projects an audio technician is also provided. The digital recording studio is of course attractive for work in the tape medium, and many tape pieces have been produced in the past two years. A short description of a few works produced at DIEM follows.
Robert Scott Thompson: Scissors of the Mind
A work for tape by a visiting American composer released on CD.

Erik Mikael Karlsson / Jens Hedman: Scar
A work for harpsichord and tape written by two Swedish composers for the Canadian harpsichordist Vivienne Spiteri. The piece has been performed in Stockholm, Bourges and at the 1992 NEMO Festival in Aarhus.

Anders Brandsgaard: - am Klariv
A work for tape commissioned for performance at a Copenhagen art gallery.

Bruno Cuignat: Atopies
A text/sound composition by a French composer and graphic artist living in Copenhagen.

Sven Erik Werner: Images of Transformation
A radio composition commissioned by the Danish Radio in cooperation with DIEM.

Nils Holger Pedersen: Ingeborg and Lars
A radio-composition commissioned by the Danish Radio in cooperation with DIEM.

John Frandsen: Askelfuglen
A radio composition commissioned by the Danish Radio in cooperation with DIEM. A version for tape and choir was also completed and premiered at the 1992 NEMO Festival by the Cantelina Choir.

Vivienne Spiteri: CD recording
Studio recording of 4 works for harpsichord and electronics by a Canadian harpsichordist.

Brian Revelander: New work
A work for chamber orchestra, piano and tape.

Gunnar Møller Pedersen: Glass Music
A 75-minute installation for four channel tape.

Ray Pits: Afgørelsen
Work for radio commissioned by the Danish Radio in cooperation with DIEM.

Sergio Schmilovich: A Man
Tape composition by a visiting Israeli composer.

Timme Øvsted: Overture to the Steel Mill
Work for tape.

Halfdan Nielsen: Dan and Halfdan
Tape music production for CD release in cooperation with Danish poet Dan Turell.

4 Interactive Works
The studio is by no means used exclusively for tape music productions. There has also been a great amount of interest in live electronics and DIEM has provided studio time and technical and financial assistance to several projects involving live electronics and interactive computer systems.

Lars Graugaard: Reflections
A work for guitar and computer composed for the Danish guitarist, Lars Hansbøll.

Wayne Siegel: Music for Wind
An installation that reacts to wind speed and wind direction. Hardware and software was developed at DIEM to allow a standard anemometer to be connected to a Macintosh computer for real time control of an algorithmic composition program developed in MAX by the composer. The work has been presented at the Lerceborg Music Days (1991), ISCM 1992 in Warsaw, Day of Music 1992 in Oslo, The 1991 ICIMC in San Jose and The 1993 Takefu International Music Festival in Japan.

Wayne Siegel: Eclipse
A work for four voices and computer commissioned by The British vocal ensemble Singcircle. The piece was premiered at the 1992 NEMO Festival and since recorded by BBC in London.

Lars Graugaard: Concerto
Interactive work for 4 percussionists, bass trombone and computer.

Anders Brandsgaard: Ghost Orchestra
Interactive work for flute, clarinet, trvsnpt, violin, viola, harp, piano and computer commissioned by the Louisiana Computer Music Festival for premiere in August, 1993.

Anker Fjeld Simonsen: Samurai
Interactive work for piano and computer commissioned by the Louisiana Computer Music Festival for premiere in August, 1993.

5 Teaching
Although DIEM is a non-affiliated independent organization, it works in close cooperation with other Danish institutions, and studio time has been made available to The Royal Academy of Music in Aarhus and The University of Aarhus for research projects and classes in electroacoustic music. DIEM has also organized many seminars for composers, including a NoT seminar in June 1991, a MAX seminar in March, 1992, and a NoT seminar in July, 1992 with Paul Lansky and David MacIff. In August 1993 DIEM presented an IRCAM ISFW seminar in conjunction with the Louisiana Computer Music Festival.
6 Research

DIEM has initiated the development of new sound processing hardware for real time DSP. The project was initiated to respond to a request by Danish composer Lars Graugaard, who wanted to have his music react in real time to digitized instrumental input, and avoid working in the sample domain. The hardware consists of an extremely powerful number crunching device (1500+ MFLOPS), converting the instrumental sounds into many frequency domain representations, thereby facilitating an intuitive approach to musically derived signal processing algorithms.

A variety of transformation algorithms are currently being investigated, and there are plans to implement many of them on the new hardware. User interface building is underway, and an operating system is in the works.

7 Concerts

In July/August 1992 DIEM hosted the 2nd NEMO Festival under the direction of Wayne Siegel. Among guest composers were Poul Lansky, Stephen Montague, David Jaffe, Andrew Schloss, Kaija Saariaho and Åke Parmerud while guest ensembles included Singcircle (UK), Cikada (Norway), Athelas (Denmark) and the Aarhus Symphony Orchestra. A wide variety of concerts, lectures and instalations were presented, and the festival was an organizational and artistic success. In July, 1992 DIEM hosted the International Rostrum for Electroacoustic Music in cooperation with the Danish Radio and the International Music Council of UNESCO. Radio producers from all over the world met in the Concert Hall Aarhus to select the best electroacoustic works to be broadcast internationally. In August, 1993 DIEM helped organize a new computer music festival at the Louisiana Museum of Contemporary Art north of Copenhagen in cooperation with the Danish Radio and the Danish section of ISCM. The festival, which is planned as a biannual event, included guest performances by the Smith Quartet (London) and soprano Frances Lynch.

8 ICMC 1994

DIEM has been selected to host the 1994 ICMC. The conference will be held in the Concert Hall Aarhus September 12-17, 1994 and the theme will be "The Human Touch". The 1994 conference will focus on the many aspects of human-machine interaction by highlighting live performance and presenting new developments in the area of user interface and instrument design. The 1994 ICMC will feature many outstanding soloists, ensembles and orchestras performing with computers. Michel Waisvisz, from Holland will give a solo performance using "The Hands". The Cikada ensemble from Oslo and the Athelas Sinfonietta from Copenhagen will both perform concerts with acoustic instruments combined with computers. The Aarhus-based dance company, Marie Brolin-Tani Dance Theater, will present an evening of computer music and ballet. And the closing concert will feature the Aarhus Symphony Orchestra. The call for music submissions includes a description of these performance groups and encourages composers to send works involving computers with instruments and dance. In addition to the performances of submitted works selected by an international jury, the 1994 ICMC will premiere two ICMA commissions as well as five new works by leading Nordic composers commissioned by DIEM. There will be a total of 11 concerts including an outdoor performance with fireworks and computer music.

Prior to the conference itself, four workshops will be held. The topics are: The Aesthetics of Computer Music, KYMA, Interactive Improvisation, and MAX Programming for the IRCAM Workstation. Emphasis has been placed on convenience for delegates, high standards of musical performance and comfortable conference facilities.

9 Conclusion

Since it was founded in 1987, DIEM has established itself as an important cultural institution in Denmark. The institution is comparatively small, giving it the advantage of flexibility and enabling it to change and grow with the needs and demands of Danish composers. The fully digital recording studio, NeXT and Macintosh computers and wide range of MIDI equipment and software have supplied composers with useful musical tools, which have been used in many different types of computer music productions. The success of the 1992 NEMO festival has provided inspiration for composers and audiences interested in computer music, while the planning of the 1994 ICMC has brought DIEM into focus within the international computer music community.