

Multimedia Imaging and Sound: Towards collaborative environments for the development of interactive sound and image

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Abstract

Throughout its history, the science of digital imaging has seen several successful collaborations with the aural sciences, in particular that of interactive sound and music. This paper identifies specific projects where the development of multimedia imaging is occurring in concert with state-of-the-art interactive music technologies - collaborative environments where computer scientists, engineers and sound artists are meeting. It offers a brief insight into the contribution being made to multimedia research by these artistic endeavors within the context of the authors Masters research project.

1. Introduction

Artists have long played an important role in perceiving and ultimately developing new applications for computers. The most significant and obvious of these are evident within the realms of multimedia, virtual reality, the film and music industries. But there has been a long desire amongst many artists to produce work that utilizes the elements of randomness, of chance. With the advent of computers, much exploration has been done towards the infinite, towards regeneration, within in the fields of digital imaging and sound.

It is within the traditions of research where science and art often co-exist. Artists such as Stelarc work with medical practitioners, robotics engineers and more recently, specialists in distributed networking, multimedia and sound artists. He has created a series of installation and performance pieces that are interactive, that engage the use of both state-of-the-art muscle and sensory stimulation devices and remote user interaction. The collaboration, in the case of Stelarc, is an ongoing research environment between a number of specialist science and arts practitioners.

2. A Brief Introduction to Interactive, Generative Sound and Music

The concept of interactive sound and music is not a new one. Improvised music is perhaps the most popular and well known form of interactive music, reliant on musicians processing and communicating musical ideas as fast as they possibly can. Computers are being employed as processors of many more musical ideas, linking and bridging people and technologies to create new ideas and experiences.

In 1981, a US based company, Hologramophone Research began exploring possibilities for computer music based on holistic or fractal tonality. In 1987 it

developed technologies for Dynamic, Non-repeating Art (DNA) and systems for interactive printing. More recently, Hologramophone Research released Pixound, a “musical color and graphics interpreter and multimedia engine”, and DNA, a “computerized method for parametrically distorting and transforming electronic images to continuously generate derivative images.” Both Pixound and DNA are quickly being developed for use within multimedia environments, an example of technical prowess and artistic sensibility.

On February 2, 1994, the contemporary Austrian composer, Karlheinz Essl, performed *Lexikon-Sonate* as a live broadcast during the radio program *Kunstradio - Radiokunst*. Essl was exploring the performance aspects of “interactive real-time composition”. Essl’s *Lexikon-Sonate* never repeated itself, providing “...a challenge to invent a particular performance situation that utilizes ... interactive facilities...”.

Essl used a Bösendorfer SE Grand Piano and radio listeners as players. Listeners could interact with a computer program by dialing a telephone number. “Whenever a call came through, *Lexikon-Sonate* would change its compositional behavior by adding a new and randomly selected module into its combination chain. In this way the totality of radio listeners would *govern* the form of the music, even though nobody could know the exact effect of their contribution.”

1996 was the year of generative music, music that is programmed to never be heard the same twice. Largely pioneered by the UK company, SSEYO, generative music authoring software relies on algorithms that mutate preset instructions over a given period of time, rendering unique arrangements of sounds, rhythms and textures. It has been adopted by Web site developers, much like Pixound, but its use within multimedia, in concert with such tools as DNA, has barely been explored.

3. An Experiment in Generative Art

Generative art adds to the creation of more holistic environments and experiences for people; whether it be a shopping mall or restaurant. Could generative art be integrated into the production of an opera, multimedia and virtual domains? No doubt it can, but it will require more opportunities for collaboration between the various arts and multimedia research disciplines.

The author’s Master’s research project, *Ausländer und Staatenlose*, an interactive online opera, is creating a bridge between interactive music, generative sound design and digital imagery. It will be accessed both via the Web and within public installations. It is one of many artist driven research projects where creative people in the arts and technical sciences are driving the development of interactive sound and image.

4. Literature

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