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

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Abstract

Throughout its history, the art and 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 author's Master of Arts research project.

It is not within the scope of this paper and its accompanying presentation to document the extensive research and arts practice conducted in this field.

It should be noted that this paper was written as a guide to support presentation materials consisting of images, quotes, sounds and videos.

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1. Introduction

Slide 1: Ideal City, Galleria Nazionale at Urbino, Francesca, Piero della (Approx. 1420-1492)

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.

Slide 2: Stockhausen prefers that the listener should be "constantly unable to see everything that is coming". "Process does not exist if you deterministically forsee the end right from the beginning so that everything is really simultaneously present." (Stockhausen, n.d.)

There has also been an emergent tradition amongst artists from the avantgarde to explore the use of computers in development of *chance* driven art works.

Slide 3: "I too think it's possible that our grandchildren will look at us in wonder and say, ' You mean you used to listen to exactly the same thing over and over again?'" (Brian Eno 1996)

With the advent of computers, much exploration has been done towards the infinite, towards regeneration, within in the fields of digital imaging and sound.

Slide 4: Graffiti - London, New York, Amsterdam, Prague, Berlin, Atlanta, San Francisco, Los Angeles, Poland, Oslo... an ever changing world wide wall! (Art Crimes, *http://www.graffiti.org*)

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.

Slide 5: "The artist [is] an evolutionary guide, exploring new trajectories... " (Stelarc, 1984)

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.

Slide 6: Hologramophone Research. Dynamic, Non-repeating Art - "...a computerised method for parametrically distorting and transforming electronic images to continuously generate derivative images."

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 colour and graphics interpreter and multimedia engine", and DNA, a "computerised 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.

Slide 7: "*Lexikon-Sonate* is an infinite composition for MIDI-controlled piano which composes and performs itself in realtime." (Essle 1994)

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 utilises … interactive facilities…"

Essl used a Bösendorfer SE Grand Piano and radio listeners as players. Listeners could interact with a computer program by dialling a telephone number. "Whenever a call came through, *Lexikon-Sonate* would change its compositional behaviour 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."

Slide 8: Koan Generative Music

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.

Slide 9: *Ausländer und Staatenlose*

The author's Master of Arts research project, *Ausländer und Staatenlose,* an interactive online opera, uses strategies developed in generative musical composition, and applying them in analagous ways towards the manipulation of visual material. It is proposed that it would 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.

Slide 10: Psy Vision, A new computer animated experience produced by Troy Innocent featuring the music of the Psy-Harmonics label. (Psy Harmonics 1997)

4. Literature

Dynamic Non-Repeating Art
[online] http://www.hologramophone.com/DNA.htm [Accessed December 1996].

Essl , K. An Interactive Real-time Composition for Computer-Controlled Piano, II Brazilian Symposium on Computer Music (Canela), 1995.

Hologramophone Research
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Stelarc 1984, *Strategies and Trajectories, Obsolete Body / Suspensions,* Calif.: JP Publications.

5. Postscript

Since this paper was presented Pixound and Hologramophone Research have removed their Web sites. The sites referenced for these companies in this paper are no longer valid.

Further information is available in the *Report on the Fifth International Conference in Central Europe…*, the accompanying presentation, *Master's Research Tour, Central Europe* and the *Summary of Masters Research,* April 1997.