Østfold University College

Norwegian Theatre Academy

MIND, THE GAP
SYNAESTHESIA AND CONTEMPORARY LIVE ART PRACTICE

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- A reflection of the art research and development project *Mind, the gap* to meet the requirements of the National Programme for Research Fellowships in the Arts, Norway.

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Preface

Synaesthesia is a fascinating phenomenon. The few who are born with it, the 'Syns', experience very real and strange sensations - such as the colour of sound or the taste of shapes, without any help other than their own sensory perceptions and the stimulus of the world around and within them. Most of them consider it to be as a gift, though at times it can disrupt their lives. Since the first recorded use of the term 'synaesthesia' in 1678 it has also caused disruptions in the fields of science, philosophy and the arts, igniting heated debates about whether it really exists as a clinical condition, or just functions on a metaphorical level. Though modern brain imaging devices have been used to show that Syn-brains work differently than others do, and new tests have been devised to attempt to diagnose it, it remains to be a somewhat mysterious and unmeasurable phenomenon with no universally accepted diagnosis.

For a period spanning over three centuries many artists have been inspired by the notion, devising ways of simulating it by (re)creating one media out of another, and attempting to communicate their work to the public as joined sensations. People such as Arthur Rimbaud, Wasilly Kandinsky, Alexander Scriabin and Vladimir Nabokov are thought to have actually had the condition themselves. This is a debatable issue and one that is impossible to prove, especially when considering that Rimbaud (just one example) explored the 'derangement of the senses' by taking psychoactive substances to achieve a heightened awareness of his world. When Rimbaud wrote “I rouge, U vert, O bleu” in *Les Voyelles* (1897) it is difficult to know if it was his syn-side speaking, or whether it was drugs, metaphor or a combination of all three. While Kandinsky is often cited as the champion of the modernist art movement, Marcel Duchamp, referred to as the originator of postmodern art, also dabbled with synaesthetics in his *Rotoreliefs* of 1935. Could just the very idea of synaesthesia be the revolutionary ingredient that has changed and fused the shape of arts by testing the limits of normal perceptions? It is at least an interesting thought.

Interest in synaesthesia has risen to the surface of western consciousness during periods of rapid technological development and social and cultural change. At other times it has been forgotten. During the late 19th, early 20th century travelers brought home with them their experiences of *The Orient* – religions and philosophies, science, drugs, spices, perfumes, fabrics, music, dance, theatre and painting. At the same time artists form Russia to America were dabbling in pseudo-religious and -scientific dreams enthused with the prospects of a new synthetic, fusionary experience of art where the divide between material world, image, word and sound would dissolve into a sensuous, spiritual ecstasy. They exploited technological developments to invent new devices for experimenting with

their ideas. Similar combinations are evident in the intermedial and psychedelic '60s, the underground acid/techno/house club scene of the late '80s early '90s, and on the cyberstage of the mid '90s, though in the latter cases synaesthesia was hardly mentioned.

Since the year 2000 a number of retrospective exhibitions thematically curated around synaesthesia have occurred in Europe and the United States. Several of them have also included the work of current day artists who mainly use the 'syn' word as a theoretic reference - as being detached, yet 'connected' to it, rather than as an origin or inspiration. Today the interest in sensorial art is rife, but it is more down to earth and integrated into contemporary art practices - more accepting of interrelated experiences than concerned with heightened awareness. Could this be because our world is becoming more connected and we, and our digital media and devices more synaesthetic?

Of course, this is all speculation on my part, which is just what my project is about. Speculating over ways to apply synaesthetic ideas to my work, putting these ideas into practice, collaborating, and creating artworks to share with others. But at the heart of my project lies a paradox. While a 'sender' may infuse their work with real or simulated synaesthetic experiences, there is no guarantee, nor any substantial way of proving that it is being received as synaesthetic. It is this paradox that has led me to the question: is it possible to evoke, even for a moment, an experience comparable to 'true' synaesthesia through art - without resorting to psychedelic drugs? - and to undertake the reckless task of attempting to do it.

Explanation of contents and source materials

This document constitutes the reflection of my practice-based research project *Mind, the Gap. Synaesthesia and contemporary live art practice.* It is divided into four main sections. Part 1 is about the organisation of my project, Parts 2 and 3 are related to my theoretical work, and Part 4 my artistic results.

Prologue

Greenland is intended to set the scene for my project by describing my local environment.

1: Introduction

Part 1 gives a brief introduction into the theme and issues of the project and a short description of my background. It describes how I have organised my project, the main tools and methods I have used in my artistic work, the networked resources I have used during the process, and some comments about documentation.

2: Synaesthesia

Part 2 introduces my theme in more detail. First it introduces the use of the word 'synaesthesia' both as a perceptual phenomenon, and as a notion that has inspired artists. The section, **S*canning history***, gives an account of the origins of the term 'synaesthesia' and its appearance throughout history in various contexts. ***A mysterious phenomenon*** describes, in simple terms, a clinical diagnosis of synaesthesia as proposed by neurologist and author Richard Cyotwic. In the section ***The Syns (are you one too?)***, I describe what it is like to be a synesthete, and draw some links between the condition and its relationship to emotions, hallucinations, metaphor and creativity. In ***Common forms*** I describe the most proliferate forms of synaesthesia, grapheme-colour synaesthesia and coloured hearing - the latter resembling the most dominant form of synaesthetic art. ***Synaesthesia and culture*** points out that contrary to the Western world, in other cultures synaesthesia is hardly known as perceptual phenomenon, but can be said to exists in cultures where interrelated experiences are commonly accepted. Here I draw on Japanese incense ceremonies as an example. ***Synthetic Synaesthesia*** draws a boundary between a 'true' synaesthetic experience and artificially created synaesthesia. It describes how, by using cross-modal devices that transfer real information of one sense on to another, something comparable to synaesthesia can be artificially created.

3: Synaesthesia and art

Part 3 is divided into two main sections. The first section is an account of the exploratory journey I

have undertaken as a way of understanding my project and interest in synaesthesia in a broader artistic context. It describes ideas related to synaesthesia and art, rather than a progressive route through styles and movements that have come to define modern art. With a point of departure in the first recorded attempt to build an ocular organ in 1725, it ends in the mid-1990s. The topics I have pursued have sprung out of my artistic practice, rather than forming a basis for it. Special emphasis has been put on parts of this story that have particularly inspired me, such as the section called ***Mixed signals and media gods***, dedicated to Steina and Woody Vasulka.

In the second section, ***Mise en scène (1995-2006)*** I set the scene for my own artistic work with synaesthesia. It departs at the point where I started to incorporate digital and communications technologies in my work in 1995 and ends in 2006. In this section I expand on my own background for working with synaesthesia and describe works that I have a close connection to, either by direct participation, or by becoming familiar with them through conference, seminar and festival attendance. In the section called ***This synaesthesia in art- what is it good for?***, I reflect over the way the questions I posed in my original project description have changed as a result of this project, and describe what synaesthesia means to me today.

Sources include informants, printed and electronic texts related to synaesthesia, colour, music, design and performance theory, new media and media archaeology, artist websites, material gathered from conference/seminar particpation, as well as diverse catalogues and audio/visual media such as interviews and documentaries.

4: Artworks

In this section I present and reflect over the artistic results of my project.

Prologue "Greenland"

I am in my third floor studio in downtown Oslo. It's called Grønland – or Greenland, but it has more colours than green. It is a melting point for the multicultural population of Oslo. Right now it is undergoing a dramatic face lifting and reconstruction process, partly due to the new Opera House that is being built not far away.

Over the street from me huge cranes swing back and forth with their heavy loads, lit up in the darker hours with green white and red lights. Cement mixers and drills bump and bonk as my view of the Oslo fjord becomes hidden by buildings that seem to grow themselves as the days pass. It is as if the aliens have landed.

Cars swoosh past, police sirens whine, their red lights reflected on the window panes together with the flashing light-ornaments of Magic City, a shop across the street. It sells trinkets, clothes, cooking implements, curtains, carpets, cups, plates, shoes, lamps, gold and parabol antennas. I can hear a gabble of languages and cell phone tones from the street below. When the wind blows in my direction the pungency of horse manure reaches my nose from the horse show in the stadium down the road. It is mixed with the smell of kebabs and pizzas of the 24-hour fast food joint in the ground floor.

It is Ramadan. The small mosque on the second floor is full to the brim with men, women and children gathered to break their fast[1] *with their traditional ritual of food and prayer. Those who don't fit inside sit on the steps and stand in the corridor with the empty shoes of those able to enter. Wafts of spicy food, incense and sweaty shoes merge with the sound of the prayer chants, and become more intense as the evening progresses. From the sound of things, it is a very emotional sceanse.*

From the recording studio on the floor above comes the repetitive efforts of a guitarist who plays the same riff over and over again, in search of the perfect sound. Only the first floor, home to a family-run electrical firm, is silent.

At times the cacophony of lights, aromas, movement and sounds is invigorating, at others it feels like a sensory assault – this synaesthesia of the city.

1 The fast is intended to be an exacting act of deep personal worship in which Muslims seek a raised level of closeness to God. The act of fasting is said to redirect the heart away from worldly activities, its purpose being to cleanse the inner soul and free it from harm. Properly observing the fast is supposed to induce a comfortable feeling of peace and calm. It also allows Muslims to practice self-discipline, sacrifice, as well as sympathy for those who are less fortunate, intending to make Muslims more generous and charitable. (http://en.wikipedia.org/wiki/Ramadan)

PART 1

INTRODUCTION

This research looks at synaesthesia from various perspectives. The result of the research project *Mind, the gap*, is a compilation of various investigated aspects of my research about synaesthesia presented in an artistic form.

Synaesthesia is the name given to a clinical condition where sensations are joined resulting in unusual experiences such as the sound of colours, the taste of shapes or the feel of aromas. Despite considerable scientific research there is still little clarity as to what causes synaesthesia. Despite this uncertainty, for several centuries artists have been seduced by the notion, which suggests a zone where everything comes together - where each sense exists so closely to another, it seems to become the other.

Simply put, synaesthesia in art refers to the (re)creation of sensations through joined media such as sounds, scents, colours and shapes. At its most evocative, synaesthetic art aspires to transmit unusual cross-modal sensations as it is made (in) public. It is a live process. It is live art.[2]

In *Mind, the Gap* I have tuned myself in to the many mutinous suggestions that synaesthesia has made over the centuries, cycling between historical and contemporary perspectives to generate new tensions in my own art-making process. The main issues that I have raised in my project are speculative to the point of being absurd.

- How big is the gap between true synaesthesia (personal) and synaesthesia in art (created by artistic intention)?

- Is it really possible to evoke, even for a moment, an experience comparable to true synaesthesia through art - without using psychedelic drugs?

- What methods can I devise to find out?

These questions are designed to be answered, not through scientific means, but as a provocation to

2 While live art was once most often connected to performance art as a genre or offspring of the visual arts in the 1980s, a definition of live art as it is exists today could be: a term given to an intrinsically live practice that embraces a diversity of disciplines and discourses related to the body, space and time. It is "a research engine where the limits of art and ideas are tested and new possibilities imagined". (From: *Live Culture at Tate Modern. Fluid Landscapes*, Lois Keidan and Daniel Brine, Live Art Development Agency, UK, 2005 http://www.thisisliveart.co.uk/projects/live_culture/lada.html).

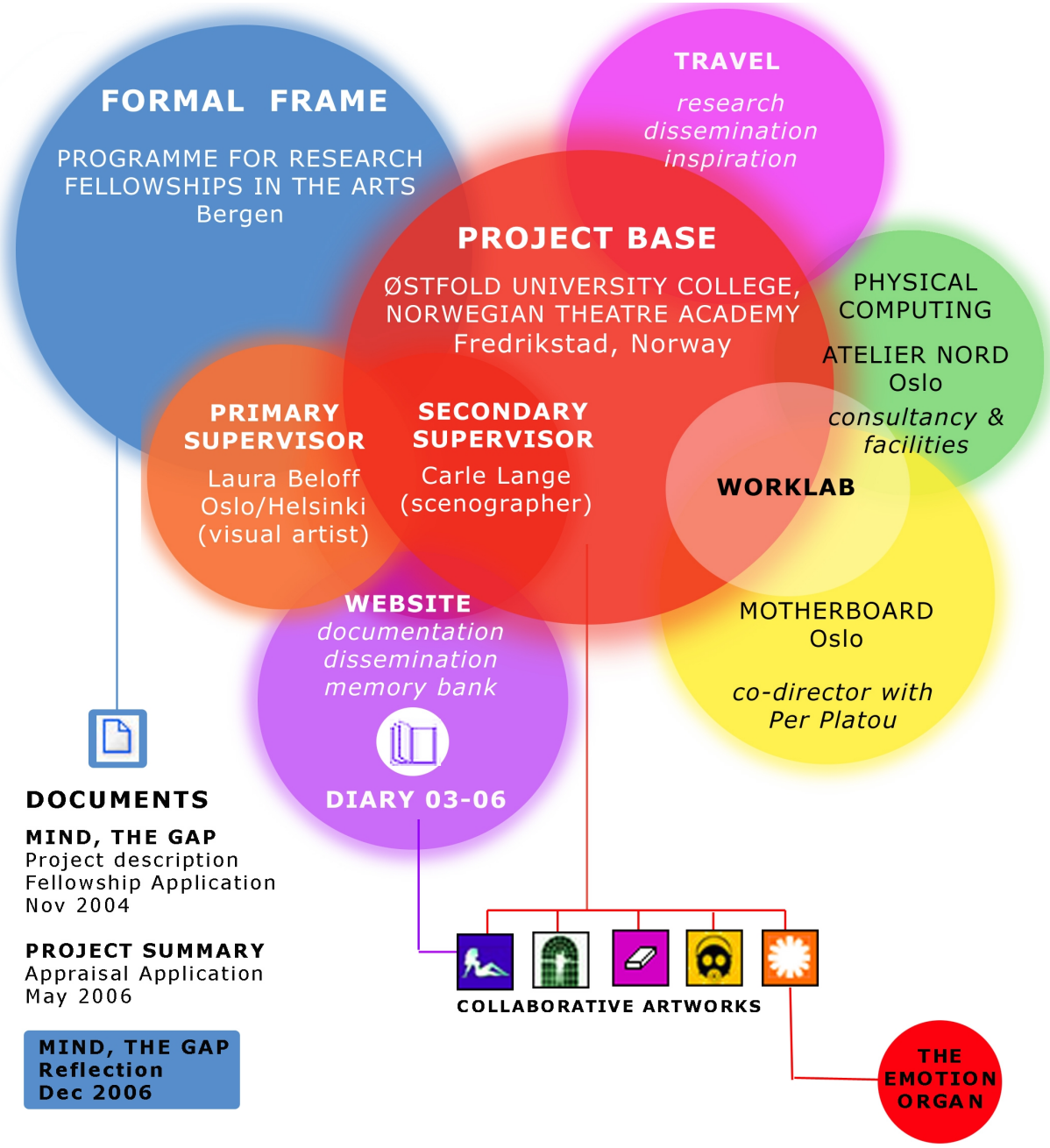
push myself through Alice's looking glass, and into unfamiliar ground; to explore the intersections of the sensory domains of seeing, hearing, touching, tasting and smelling, their possible synaesthetic manifestations in the material world, and the consequent emotive responses they can evoke.

My background

Curator and researcher Annet Dekker has mapped the journey of synaesthetic performance to the history of the live image, its connection to sound, and the circumstances that led to the emergence of the Video Jockey (VJ) in the underground House club scene of the late 1980's – 90's. It is a period that I have direct experience with, initially as an avid choreography student working out on the dance floor with my friends. Then, as a Video Jockey using my computer, MIDI devices and video equipment to make live video mixes to the beat of the music, combining existing media with live video and abstract, generative visual media in keeping with the development of technology and the post-modern attitude of the time. Working mainly through the live art group Motherboard (founded in 1996 with my artistic partner Per Platou), I left the traditional dance scene to collaborate with others with backgrounds in visual art, music, dance, theatre, light design and film creating participatory installations and performance events, not only for clubs, but also urban spaces, galleries and theatres, often using the internet to join spaces from several continents together. Though I hardly new its name, synaesthesia was working for us.

Project organisation

The diagram below is a visual representation of how I have organised my project.



Project base

My project is based at the Norwegian Theatre Academy (NTA) which is part of Øsftfold University College. It is a small institution with around 25 students. It offers two courses of study - scenography and acting at Bachelor level. Its focus is on Visual Theatre, where impulses from the field of visual arts are integrated with teaching methods in the performing arts; a cross-disciplinary approach to theatre studies that is unique in Norway.

I have been employed at NTA as a research fellow since May 2003 where I have both contributed to developing the Multi Media Module (a compulsory course for students), supervised student worklabs, and acted as a consultant for student projects.

Formal frame

In January 2005 my project, *Mind, the Gap* was accepted into the new National Programme for Research Fellowships in the Arts, which provided a formal framework for my project within the academic sphere. The fellowship programme is a new recruitment initiative to enable artistic research and development work at a high level, where successful candidates will be considered as qualified for the academic post of Senior Lecturer/Associate Professor. Requirements for successfully completing this programme are based on an evaluation of artistic results at international level, documentation of process and results, and a critical reflection in relation to these activities. The evaluation is conducted by independent, international appraisal committee of at least three members.

Supervision

Candidates of the Fellowship Programme are required to have two supervisors. As I already have six years of higher education in dance and choreography I selected supervisors who could bring other perspectives to the understanding of my work. My main supervisor, Laura Beloff, has worked extensively with electronic media and communications systems from the perspective of the visual arts.[3] Most importantly, she has assisted me in defining the limits of my project in relation to both the formal framework of the academic system and the central theme of my project, synaesthesia. My secondary supervisor, Associate Professor Carle Lange, works as scenographer and performance artist. He has acted as Dean of the Norwegian Theatre Academy since September 2006, prior to which his role at the Academy was as Head of Scenography. Through my contact with him as well as working at NTA, I have particularly benefited from gaining a greater insight to approaches of scenography that I have applied to my own work.

Worklab, Fredrikstad/Oslo

The practical artistic work of my project has been carried out at the NTA, Atelier Nord and from my studio in Oslo at various stages in my project. In the latter stages I have mainly worked from my studio, which I set up as an experimental laboratory space, open for visits from students and staff of the NTA, supervisors, collaborators, consultants, other interested parties and 'testers'.

3 Since supervising my project Laura has left her position as Professor of media arts at the National Academy of Fine Arts in Oslo to pursue her own artistic interests from her new base in Helsinki.

Atelier Nord, Oslo

Atelier Nord is a project base for unstable art forms, such as electronic and new media art. Its aim is to improve conditions for these art forms, and to maintain a critical reflection in relation to them. Its work consists of producing and supporting projects that promote these goals.

Atelier Nord has provided me with with resources for developing skills in physical computing. These include workshop participation (introductory courses to programming with Max/MSP/Jitter[4] and sensor building, and project-based courses for conceptual development), studio space and consultancy services. Artist and inventor Erich Berger has assisted me with the physical aspects of my project such as sensor/interface design and construction, while visual artist Piotr Pajchel has assisted me with the programming work I have carried out in the last stages of my project.

Motherboard, Oslo

Collaborating in three artworks produced by Motherboard has provided an opportunity to test both practical and conceptual aspects of the work I have developed through my research in synaesthesia in a public forum. Feedback from both the public, the critics, my collaborators and supervisors has proved a valuable resource for the development of my project.

Website

I have designed my project website for a variety of functions. Primarily it is a documentation of my process and artistic results. Secondly it is a tool for communications with my supervisors and for informing and accrediting the numerous people, both in Norway and abroad, who have assisted me in my project. Thirdly it has functioned as a public site for disseminating my project to a wide audience, and includes resources and references for the benefit of others.

Travel

During the space of my fellowship period I have traveled to various locations in Norway, Europe and the USA and in varying capacities - conference/seminar/festival participation, research and inspiration, and project dissemination.

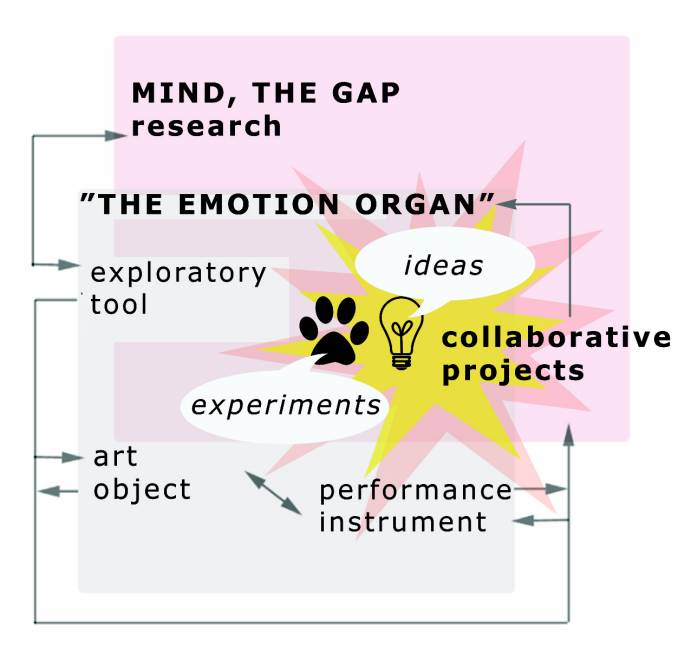
The Emotion Organ

The Emotion Organ is the main manifestation of my artistic research. It is a simulacrum machine, a pump organ from 1895 transformed into a new and unique instrument. When set in action by a player it produces a cacophony of combined sensory output – sound, projected colour, light, aroma,

4 Max/MSP is a graphical programming environment for music, audio and mixed media. Jitter adds specific video functions to Max. Max/MSP has been used by artists of various disciplines for a period of about 15 years.

vibration and movement. It is through the invention and construction of this machine that I have conducted research into synaesthesia, both in practice and theory. Through this process I have attempted to answer the question; is it possible to evoke something comparable to a genuine synaesthetic experience through art without using drugs?

Below is a visualisation of The Emotion Organ in relation to my research project, Mind, the gap.



The Emotion Organ fulfills several functions. It is intended as:

- A conceptual tool for generating practical artistic work, developing skills, knowledge, and testing various artistic concepts and contexts in relation to my theme.
- A performance instrument for virtuoso players.
- An art object that embodies ideas of synaesthesia and art from both the past and the present.

My theoretical research has sprung out of, and fed in to, my artistic work. In fact it is hard to separate the one from the other. An example is my research into the most accepted clinical diagnosis of synaesthesia today (described in Part 2) as an inspiration for shaping the relationship between the player, machine and the outcome of the meeting between the two.

Physical computing is an important part of my project. It is about 'sensing', both in terms of designing and constructing technological systems for detecting gestures from the real world, and

sensing the outcomes through 'listening' with the body. Over the past two years I have smelt my singed hair and fingers when attempting to solder small components, and got high on experiments with aromas, colours, kinetics, tastes and sounds, both individually and in varying combinations.[5]

I have tested my work on others both in my workspace, and through collaborating in related projects. From these activities I have collected subjective responses to my work from family, friends, colleagues and supervisors as well as public critiques. I have fed this response back into my project.

Collaborative art works

Below is a list of the collaborative live art productions I have taken part in:

- ***The 8th Sister***, produced by Motherboard, Træna, North Norway, July 2005. A site specific underwater sculpture whose 'true' form is manifested on an echosounder display.

- ***Imagining St Mary Magdalene***, produced by FUNK.CO.UK, London, July 2005. A site specific 'living' church window fresco related to visual music.

- ***Eraser's Edge***, produced by Ny Musikk for Ultima 2005 Festival, Oslo, October 2005. A performance related to visual music in a concert setting.

- ***IKON***, produced by Motherboard, Grusomhetens Teater, Oslo, December 2005. A black box theatre production in the form of a monologue that applied a synaesthetic live art mode to both process and performance.

- ***In Death Valley everywhere we looked, gently waving stands of golden desert blossoms were dancing in the wind, their daisy-like faces punctuated with vibrant orange centers***, produced by Motherboard for Galleri F15 in Moss, May 2005. A synaesthetic installation presented in the context of a white cube.

Both The Emotion Organ and the works listed above are described and discussed in more detail in Part 4: Artworks.

Documentation

The issue of how to document performance events that involve live processes and rely on the presence of the public to complete the work has long since been problematic. Video documentation

5 I have even tested the synthesized smell of hashish to see if it could evoke an intoxicating effect on clandestine smokers, but to no avail. The aroma did not live up to its descriptor.

gives restricted perspectives of works that are intended to be experienced from various perspectives and are context-sensitive. I have therefore chosen a composite form of documentation including web-based and DVD video documentation. In addition The Emotion Organ, as a physical object, is itself a relevant form of documentation, though it can only be viewed locally. The Emotion Organ, as a live art event, will be documented as video during my final presentation in January 2007.

The main distributable form of documentation of my process and artistic results has taken the form of a website: http://www.notam02.no/motherboard/synaesthesia. The portal gives a representation of its contents pointing to a diary of significant events, formal documents submitted to the Programme for Research Fellowships in the Arts, documentation of artistic results and a section dedicated to relevant links. The website includes texts, diagrams, photographs and video documentation of both process and results.

As a supplement to web-based documentation I have edited video material of the collaborative artworks I have taken part in. These are presented in DVD format, each with its own style according to the nature of the work. Due to an unfortunate occurrence, the only source of video documentation of my participation in *Eraser's Edge* is unusable. This work is documented with text, audio and visual material on my project website.

PART 2

SYNAESTHESIA

Synaesthesia means “the union of the senses”.

In clinical terms synesthesia is a rare condition that causes the information received by one sense to be experienced simultaneously and involuntarily by another sense. People with synaesthesia can 'taste' shapes, 'hear' colors, or experience other sensory cross-wirings and consequent sensations.

The notion has inspired artists for several centuries, suggesting a zone where each sense exists so closely to another that it seems to become the other. Since even before the first colour-organ was devised to create a visual equivalent to music in the 18th C, it has raised questions about whether the arts can be divided into disciplines that work with separately perceived stimuli, or whether these disciplines are a part of a larger system that unites the different disciplines. Simply put, synaesthesia in art refers to the (re)creation of sensations through joined media such as sounds, scents, colours and shapes.

Historically synaesthetic art has referred to a wide range of artistic experiments that synthesize different art disciplines evident in genres such as visual music, abstract painting and film, experimental theatre, symbolist poetry, science fiction and intermedial, electronic and generative art. The creation of synaesthetic art has often involved new inventions that can transfer the qualities of one sensory domain onto another.

Scanning history

One of the earliest links to synaesthesia is via the ancient Greek medics' use of the word 'sympathy' which they used to describe how one stimulus gives rise to a sensation in another sensory mode. It also meant an understanding between people.

One of the first records of the use of the word 'synaesthesia' can be found in 1678 when R. Cudworth published *The True Intellectual System of the Universe*[6]. In the 1700's an English medic called Robert Whytt wrote about the 'sympathy of the nerves' as the source for reflex sensitivities. Another English, ophthalmologist Thomas Woolhouse reported meeting a blind man who perceived sound-induced coloured visions. In 1725, the ocular harpsichord - an instrument that played sound and light simultaneously - was invented in France by Jesuit priest, Louis-Bertrand Castel.

6 *The true intellectual system of the universe : the first part, wherein all the reason and philosophy of atheism is confuted and its impossibility demonstrated*. Ralph Cudworth, London : Printed for R.Royston, 1678.

During the 19th C, synaesthesia attracted the attention of psychologists, artists and natural philosophers. The German poet and bureaucrat Johann Wolfgang von Goethe (1749-1832) wrote about the correspondences between color and other senses in his book *Theory of Color* (1810). Francis Galton (1822-1911), British psychologist and avid African explorer, published articles on both colour associations, statistics on mental imagery and visualised numerals that referred to synaesthesia. Similar topics were covered in France and America. Mary Whiton Calkins (1863-1930), the first woman president of the American Psychological Association and champion of women's rights, wrote, performed and supervised studies on association, memory, sensation, aesthetics, and synaesthesia. The term 'synaesthesis' was also used as a form of literary criticism.

In the first half of the 1900's scientific writings and research on synaesthesia covered topics such as *Artificial psychoses produced by mescaline*, *Visual pain and visual audition*, *Synaesthestic factors in judging the voice*, *On motor synesthesias*, *Unseen drama and imagery* and *Tone shapes*, *A novel type of synaesthesia* extended the scope of synaesthetic writing. Sensory fusion became a frequent idea in art, literature and music. Russian composer Alexander Scriabin (1872-1915) expressed his own synaesthesia in his symphony *Prometheus* written in 1910-11. Composed for an orchestra with piano, organ and choir, it also included a muted key-board that controlled the play of coloured light in the form of beams, clouds, and other shapes, flooding the concert hall and culminating in a bright white light. Another Russian, Wassily Kandinsky (1866-1944) explored the relationship between sound, light and movement. He used musical terms to describe his paintings as 'improvisations' or 'compositions' and spoke of 'the vibrations of the soul'. The poetry of both Charles Baudelaire (1821-67) and Arthur Rimbaud (1854-1891) had direct references to synaesthetic perceptions.

While art continued to be informed by the notion of synaesthesia through experimental practices referred to as visual music, color music and lumia, the rest of the world seemed to have forgotten it, and continued to forget it for the next four decades. This was partly due to the preference for behaviourism as a way of interpreting what people do. Basically, behaviourism in psychology focused on observable behaviour. Simply put, if you can't see something, it doesn't exist. As no one else could see what a synaesthete saw, behaviourists dismissed synaesthesia (and cognitive science) because it was hard to prove. It is hard to say exactly when behaviourism lost its power over the cognitive approach, but synaesthesia re-surfaced once again in the 1960's, often in connection with the use of hallucinogenic drugs (especially LSD and hashish), rock and pop concerts, happenings and a youth culture bent on exploring a radically new way of perceiving the world. In 1968 one of the most famous books about clinical synaesthesia was published - *The Mind of a Mnemonist: A Little Book about a*

*Vast Memory*by physicist A.R Luria[7]. It describes a man who made a living by exploiting the the way his synaesthesia enhanced his memory. He had five sensory synaesthetic connections, an incredible ability to remember data, but trouble remembering a word if its sound did not fit its meaning. It also describes how his memory involved fascinating aspects of having to learn how to forget, and his methods of problem-solving.

By the 1980's, as the cognitive revolution peaked, synaesthesia was back in business. In America the neurologist and author Richard E. Cytowic promoted the idea that we are all born as Syns, but that our abilities diminish as we grow older. Synaesthesia, he says, *is "abnormal" only in being statistically rare. It is, in fact, a normal brain process that is prematurely displayed to consciousness in a minority of individuals.*[8] While contributing to returning synaesthesia to the scientific mainstream[9], he also made his ideas accessible to a wider public through his popular science book, "The Man Who Tasted Shapes".

Rapid developments of new experimental techniques and technologies in both psychology and human neuroscience caused the interest in synaesthesia as a legitimate topic for scientific investigation to be rekindled - not only for its own sake, but how studying the anomaly can spread more light on how everyone's brains work. In the mid '90s the Internet provided a channel of communication where people with synaesthesia (some of them researchers themselves) could easily get together to compare notes. Organisations were formed, such as the UK and American Synaesthesia Associations. They began to form their own conferences so they could find out more about their unusual abilities and to make active contributions to the ongoing research. Synaesthesia has captured the interest of a wider public, particularly in the UK, through a series radio and TV broadcasts produced by BBC. The UK Synaesthesia Association Conference in April 2006[10] included lectures by prominent researchers such as Edward M. Hubbard, Jamie Ward, V.S. Ramachandran and David Eagleman, to mention but a few. The diversity of the subjects covered revealed the complexity involved in unraveling the mysteries of synaesthesia, and the interdisciplinary scope of synaesthetic research. The conference also included presentations by artists and people with synaesthesia.

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7 *The Mind of a Mnemonist: A Little Book about a vast memory* by A.R. Luria, has recently been republished in 2006 by Havard Books, ISBN 0674576225.

8 Richard E. Cytowic, *Synesthesia: Phenomenology And Neuropsychology, A Review of Current Knowledge*, (c) Richard E. Cytowic 1995. Published in PSYCHE, 2(10), July 1995 http://psyche.cs.monash.edu.au/v2/psyche-2-10-cytowic.html

9 Richard Cytowic led synaesthetic research in the United States with Larry Marks, while in England synaesthetic research was led by Simon Baron-Cohen and Jeffrey Gray.

10 The Association brings scientists, researchers, students and synaesthetes together and provides verifiable and reliable information regarding the condition for the media and any other interested parties.

A mysterious phenomenon

In medical terms synaesthesia is a rare condition in which two or more of the senses that are normally experienced separately are simultaneously and automatically joined together. Some synaesthetes experience colour when they hear sounds or read words and numbers. Others experience tastes, smells, shapes or touches in a multitude of combinations. However, the do not work both ways, meaning that if you can 'hear' colour, you cannot automatically 'see' sound.

Synaesthetic sensations are experienced as being durable, very real, often profound and can trigger emotional responses. They are not elaborate and pictorial, but more simple and abstract. They can be projected outside, but close to the body (in visual synaesthesia, like a hallucination) or experienced internally - in the mind's eye, so to speak. A stimulus does not have to be physically present to trigger synaesthetic sensations. They can also be triggered by so-called 'inner speech'.

The Syns (are you one too?)

Synaesthetes often refer to themselves simply as the 'Syns'. Having discovered that the way they experience the world was special, attempts to seek answers from doctors for the cause of their unusual sensations often result in frustration, raising suspicions as to whether these sensations were caused by taking psychedelic drugs, or whether psychological problems were the cause of their 'imaginary' experiences.

Generally speaking, Syns are more sensitive to their surroundings than others. One Syn who took part in the UK Synaesthesia Association Annual Conference (2006) spoke about the emotional impact of experiencing tastes with specific words, and the difficulty of maintaining relationships with women whose names evoke a bad taste. One partner even changed her name in an attempt to rectify this situation – without avail. The taste evoked by her original name stuck to her. Cooking could also be difficult with potato-tasting words, and sipping sherry while watching sherry advertisements on the TV was like a proper LSD trip without taking LSD. [11] If someone said "chicken" while he was eating chicken the experience of both the 'real' taste and the syn taste of chicken could be a bit confusing – a bit of a sensory overload.

11 Hallucinogenic drugs such as mescaline and LSD can cause temporary states of synaesthesia, but the cross-wired connections do not remain constant as they do in synaesthetes. Other temporary states of synaesthesia can be caused by migraines, epilepsy and sometimes briefly experienced at the moment of waking from sleep.

The description of his ability seems to resonate in the infamous phrase from *Romeo and Juliet:*

What's in a name?

That which we call a rose

By any other word would smell as sweet.[12]

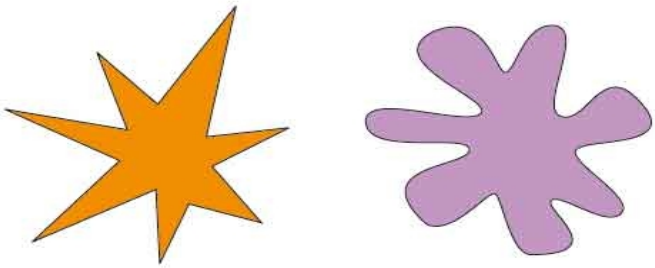
While this one short phrase embodies the central issue and tragedy of the play, it is also said to be a pun on the terrible stench of the Globe Theatre. Puns aside, the phrase above is first and foremost a metaphor[13] and not necessarily evidence of synaesthesia. However, Professor Ramachandran is particularly interested in metaphors as a type of creativity that is used in everyday speech, often involving links to the senses.[14]

"Our language is replete with what we might call synaesthetic metaphors, where you are sort of linking different sensory systems in metaphorical usage. As, for example, you say loud shirt. My shirt's not making any noise, why do you call it loud shirt, you instantly understand what I'm talking about. It heightens your appreciation of its vivid colour. Or when you say cheddar cheese is sharp. Obviously, cheese isn't sharp, if you rub it on your skin it's soft but then you say well no no no, I mean it tastes sharp but there's a circularity and we're using a tactile adjective to describe a taste. I think that use of metaphor may rely on mechanisms similar to those used in synaesthesia. One highly speculative idea is that maybe the same genes which give rise to synaesthesia, when expressed more diffusely, may be more prone to make these links across different conceptual realms, therefore make you more creative, more imaginative, make you more prone to metaphor in other words." Below are two images that he uses to describe how the connection between languages and shapes may not be arbitrary - or strictly metaphoric.

12 (From Romeo and Juliet - II, ii, 1-2) In this phrase Juliet tells Romeo that a name is an artificial and meaningless convention, and that she loves the person who is called "Montague", not the Montague name and not the Montague family. Out of his passion for Juliet Romeo rejects his family name and vows, as Juliet asks, to "deny (his) father" and instead be "new baptized" as Juliet's lover.

13 The origins of the term 'metaphor' can be found in the late 15th century: from French 'métaphore', via Latin from Greek 'metaphora', and 'metapherein' - to transfer. The Latin prefix'Meta', means 'beyond' or 'transcending'.

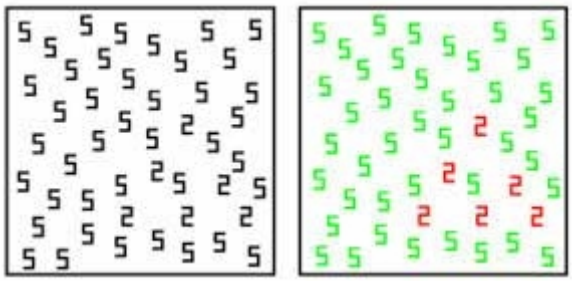
14 See *Purple Numbers and Sharp Cheese*, Professor Vilayanur S Ramachandran, The Reith Lectures, Lecture 4, BBC Radio 4, 2003: http://www.bbc.co.uk/radio4/reith2003/lecture4.shtml



Take a look at each image above, and decide which one is *Booba* and which one is *Kiki*. Tests have shown that as many as 98% of people agree that the image on the left is Kiki and the image on the right is Booba.[15]

Another Syn spoke about her grapheme and music note/colour synaesthesia, an ability that she seems to have passed down to her two Syn children. She described the difficulty that her children were experiencing for gaining acceptance for their grapheme-colour synaesthesia at school. Rather than being encouraged to use their unusual abilities to aid their learning experience[16], they were looked upon as an irritating hindrance. That synaesthesia seems to be passed down from generation to generation suggests that there is also a genetic explanation for the condition.

The image below is a test used to describe the reality of the experience of colour-grapheme synaesthesia[17]. It may help to illustrate what their experience is like.



A non-Syn will take longer to distinguish the 2's from the 5's in the left hand image, while a Syn with these cross-wired connections will automatically see the numbers with their corresponding colours, and rapidly identify a triangle shape in the arrangement of the 2's (as depicted in the image to the

15 Booba and Kiki is based on a psychological experiment originally designed by Wolfgang Köhler in 1929. Ramachandran , and many others use the two images as an example of how these connections may not be arbitrary.

16 "Researchers have begun to investigate the effects of grapheme-colour synaesthesia on numerical cognition. A study by Dixon and colleagues (2000) suggests that the concept of a number alone is sufficient to trigger its synaesthetic colour (known as a photism). This finding raises some interesting questions. If the very concept of a number can trigger a photism, what effect might this have during various processes of mathematical calculation when multiple numbers are being compared and manipulated? Though synaesthetes commonly report difficulties in the area of mathematics, others find it can be an advantage in some ways. For instance, many synaesthetes use their perceptions as a mnemonic device to help them remember numerical information such as phone numbers, addresses or dates." Jennifer Green, *Synaesthesia and number*: http://www.educ.cam.ac.uk/synaesthesia/number.html

17 This test is devised by E. M Hubbard.

right). When this test was run on Syns, but with the numbers replaced by Roman numerals (II for 2, V for 5) they did not retain their syn-colour. It is the shape that counts.

Common forms

While there are numerous kinds of synaesthesia, grapheme-colour synaesthesia is one of the most common manifestations of the anomaly. Studies related to grapheme-colour synaesthesia suggest that there may be a neural basis for the condition. One theory suggests that different parts of our brains are dedicated to perform specific functions, and that the regions involved in identifying letters and numbers appear to lie next to a region dedicated to colour processing. The added sensation of seeing colours when looking at graphemes might be due to a heightened "cross-activation" in the colour processing region. This heightened activity may also explain why the connection between these areas have been left open in Syns.

The other common syn connection is coloured hearing, and it is this aspect of synaesthesia – the fusion of sound and image - that, for several centuries, has dominated the production of artworks inspired by the phenomenon. Generally speaking other cross-wired sensory connections (such as the feel of aromas) have been left to play second fiddle.

Synaesthesia and culture

Though synaesthesia has been the subject of research and debate for several centuries in the western world, in other cultures synaesthesia as a perceptual phenomenon is hardly known. However, neurologist Richard Cytowic writes about olfactory synaesthesia in Japanese culture in terms of metaphor:

"Japanese culture understands 'synesthesia' as metaphoric whereas it hardly knows the perceptual phenomenon. Possible explanations include a cultural attitude of interrelated experience, Buddhism, and Nishida Kitarô's type of phenomenal philosophy.[18] Taste and smell account for only a small percentage of synesthesiae, but hold important clues. Aroma distinctively modifies emotions and behavior unconsciously and automatically. Neural networks explain how fragrance–activated multisensory perceptions and memories can subsequently inspire creative associations, metaphors,

18 About Nishida Kitarô, professor of philosophy John Maraldo writes that he was "*t*he most significant and influential Japanese philosopher of the twentieth-century. His work is pathbreaking in several respects: it established in Japan the creative discipline of philosophy as practiced in Europe and North America; it enriched that discipline by infusing Anglo-European philosophy with Asian sources of thought; it provided a new basis for philosophical treatments of East Asian Buddhist thought; and it produced novel theories of self and world with rich implications for contemporary philosophizing.*"*
- Stanford Encyclopedia of Philosophy, 2005 (http://plato.stanford.edu/entries/nishida-kitaro/)

and verbal concepts. The early engagement of limbic structures by olfaction (only three synapses removed from hippocampus instead of the usual five) stresses implicit processing, which is precisely what makes it a promising gateway to other cognitive domains."[19]

The Japanese incense ceremony, 'Kodo'[20], provides one example of synaesthetic metaphor in Japanese culture. Kodo is, in practice, a number of things - theatre, a social gathering, a game, a mindfulness practice, and a celebration of, and inquiry into the aromatics of aloeswood.

Modern day Kodo ceremonies draw on a centuries-old tradition of evaluating and classifying incense, and include several games and rules for appreciating and 'listening' to up to six aromatic aloeswoods.[21] The term 'listening' is used to symbolize the mindfulness and attention that must be paid to the qualities of each aroma used in the ceremony.

The incense games are often based on seasonal themes, history, classic literature, poetry, or travel. They are not contests but simply methods for enjoying the fragrances and reawakening and sharpening the sense of smell. While both department stores and cultural centres throughout Japan provide opportunities to participate in games and ceremonies led by a Kodo Lecturer or master, people also get together to learn the basics and play the games at friendly house parties.

The ceremony typically takes place in a room where up to fifteen people are gathered, sitting in a square with the teishu (talker), scorekeeper, and komoto (incense presenter) at the front. Each participant has a score sheet to record her impressions or observations of her experiences of the aromas to be presented. The komoto prepares a cup of rice ash, in which is buried a piece of hot bamboo charcoal. A small mica plate is placed over the charcoal and a tiny piece of aromatic wood is laid on the mica. As the wood heats up it emits its aroma.

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19 From the abstract, *Aromas. Implicit gateway to cognition,* Richard E. Cytowic, presented at various conferences since 2003.

20 Kodo is translated as "the way of incense" or "incense appreciation." Koh means "incense" and do means "the way of "or "appreciation of." It is also written as koh dou or koh do. (From: http://www.scentsofearth.com/Kodo/What-is-Kodo.htm)

21 The traditional Japanese classifications of Aloeswood is called ***Rikkoku***, literally translated as the "Six Countries of Aloeswood". The six classifications are as follows: ***Kyara*** - A gentle and dignified smell with a touch of bitterness. The fragrance is like an aristocrat in its elegance and gracefulness. ***Rakoku*** - a sharp and pungent smell similar to sandalwood. Its smell is generally bitter, and reminds one of a warrior. ***Manaka*** - smells light and enticing, changing like the mood of a woman with bitter feelings. None of the five qualities (tastes) are easily detectable. The fragrance is of good quality if it disappears quickly. ***Manaban*** - mostly sweet. The presence of sticky oil on a mica piece is often a sign that the fragrance is Manaban. The smell is coarse and unrefined, just like that of a peasant. ***Sumotara*** - sour at the beginning and end. Sometimes mistaken for Kyara, it has something, however, distasteful and ill-bred about it, like a servant disguised as a noble person. ***Sasora*** - cool and sour. Good-quality Sasora is mistaken for kyara, especially when it first begins to burn. Sometimes it is so light and faint that one may think the smell has disappeared. It reminds one of a monk. (These descriptions are taken from "The Book of Incense," by Kiyoko Morit, as found on: http://www.scentsofearth.com/Kodo/Rikkoku.htm)

One of the first skills to learn is how to hold the Kodo Cup and to listen properly to the five defined qualities or 'tastes' of each aroma – sweet, sour, hot, salty and bitter [22]. The hand is used over the cup to produce a 'listening line' that directs the aroma to the nostrils. To listen properly to each of the five defined qualities of aroma, five shapes must be made by the hand over the bowl.

Listening to aroma

The circle on the left the shows the "True Ash" yang pattern of the Oie ryu. The Kiki-suji [Listening line] is a small triangle without lines as indicated above The opening of the hand is formed so that only the "Listening Line" is visible through the opening. The photo on the right shows the same pattern reflected in the rice ash of the incense cup.(Images from www.scentsofearth.com)

22 Sweet resembles the smell of honey or concentrated sugar. Sour resembles the smell of plumbs or other acidic fruit. Hot resembles the smell of burning peppers on a fire. Salty resembles the smell of a towel after wiping perspiration from the brow or the lingering smell of ocean water when seaweed is dried on a fire. Bitter resembles the smell of bitter herbal medicine when it is mixed or boiled.

Synthetic Synaesthesia

By using cross-modal devices to transfer real information of one sense (sight, sound, touch, taste, or smell) and map it onto other senses, something comparable to synaesthesia can be artificially created.

An example of synthetic synaesthesia is ultrasound that renders 2d images of depth via sound waves. It was first used for medical purposes for locating and diagnosing cancerous growths in 1942, and later to determine the health of a baby in pregnancy and to navigate the depths of the ocean. Modern imaging devices that visualize electrical activity in the brain by mapping movement on to colour have aided neuroscientists in their quest to convince the world that syn-brains act differently from those of non-syns.

Psychedelic drugs such as LSD and Ecstasy can also evoke and enhance synaesthetic experiences, though unlike 'true' synaesthesia their effects are temporal, and the cross-wired sensations that are experienced do not remain constant, but can vary from trip to trip.

Artworks that aspire to evoke something comparable to a synsaesthetic experience in the public may also be described in terms of synthetic synaesthesia – or synaesthesia created by artistic intention.

PART 3

SYNAESTHESIA AND ART

In this research synaesthetic art refers to works that attempt to fuse the senses in unusual ways, and aims to communicate them to the public directly as joined sensations – as experiences rather than observations of art objects. That synaesthestic art needs to be experienced directly rather than observed from a distance suggests that the role of the public is participatory.

Over a period spanning three centuries artists and inventors have investigated and experimented with both perceptual and emotional mechanisms of synaesthetic experiences. Many of them have claimed (or are thought) to be Syns themselves, including Arthur Rimbaud, Wassily Kandinsky, Alexander Scriabin, Vladimir Nabokov, and David Hockney. Others have let themselves be inspired by the phenomenon. Though traces of synaesthesia in art are evident in many genres, the most dominant forms relate to the audio-visual sphere.

A journey through exploratory ideas related to synaesthesia

This description of the history of synaesthetia in art follows a line of exploratory ideas related to synaesthesia, rather than describing a progressive route through styles and movements that have come to define modern art. At times the boundaries between art, popular culture and invention are blurred. The story is by no means complete. It seeks to form a path that leads towards the subject of this research - synaesthesia and contemporary live art practice.

The earliest recored attempt to build an ocular keyboard instrument

The earliest recorded attempt to build an ocular keyboard instrument is the ocular harpsichord of Louis-Betrand Castel in 1725. He was devoted to mathematics and natural philosophy and attempted to build an instrument that would illustrate, and hence prove his theories on the melodies of colour.[23] His aim was to create an instrument that produced coloured light out of sound - an instrument that would enable the deaf to see.

His instrument consisted of a frame above a normal harpsichord; the frame contained 60 or 80 (the actual number is disputable) small windows each with a different colored-glass pane and a small curtain attached by pullies to one specific key, so that each time that key was struck, that curtain would lift briefly to show a flash of corresponding color. [24]

23 He opposed Newton's theories, leaning rather towards psychological and philospohical implications.

24 In his paper *The ocular harpsichord of Louis-Bertrand Castel: The science and aesthetics of an eighteenth-centure cause celebre*, Martin Franssen describes how enlightenment society was dazzled by this invention, and flocked to

Not satisfied, he designed an improved model that used some 500 candles with reflecting mirrors to provide enough light for a larger audience - to immerse them in a collective experience. Castel envisaged that every home in Paris would one day have such an instrument – and that a factory would be built to produce them, but his ideas were hard to realise, extending beyond the technology of his time. Reports suggest that he was never satisfied with the results of his practical work. Despite eye witness reports[25], without any remaining physical relic of his invention there remains a shadow of doubt as to whether it ever really existed at all.

He was not just interested in the music of colours, but also the music of tastes, touches and smells.

1o. Take some forty scent bottles filled with different perfumes, cover them with valves, and arrange them so that the pressing of the keys open these valves: there you are for the nose.

2o. On a board arrange objects that can make different impressions on the hand, and then let the hand come down on each of them: there you are for the touch.

3o. Arrange likewise some objects that taste fine, interspersed with bitter objects. But am I talking to people who have to be told everything? [26]

Despite this, and the fact that Castel was not an artist, his ideas reflected notions of art that were to emerge even when his ideas had been forgotten.

Panoramas and dioramas – active experiences of space

In the late 1700s panorama paintings shown on cylindrical screens and viewed from the inside became popular in England. They presented the public with a chance to view other worlds, providing an illusion of an active experience of space. Then, in the early 1800s the first Dioramas were screened in Europe and America – large screens placed in front of audiences with images that changed every 15 minutes or so to the accompaniment of music, and with special smoke and light effects. Though influential in their time they were regarded as outside the scope of art, but they could represent an early form of synaesthetic performance.

Opium dreams

In 1822 the Englishman Thomas De Quincey wrote *The Confessions of an English Opium Eater* in which he discusses his experiences with the 'oriental drug' and his explorations as an East End *flaneur* in

his Paris studio for demonstrations – inventions where not supposed to depict art, or take you to another place, they were tools for artists to depict nature, and it was not until the Romantic era that this view changed.

25 Amongst others, the German composer Telemann traveled to France to see it, composed some pieces to be played on the Ocular Harpsichord, and wrote a German-language book about it.

26 As quoted by Martin Franssen in *The ocular harpsichord of Louis-Bertrand Castel: The science and aesthetics of an eighteenth-centure cause celebre*. Published in Tractrix Yearbook for the History of Science, Medicine, Technology and Mathematics, 1991.

similar terms. He describes in detail the hallucinations he experienced ranging from the euphoric to the terrifying, taking him out of London's East End to China and the Malays. Nightly spectacles of "more than earthly splendor" and "theatres (that) opened and lighted within (his) brain".[27] Towards the end he is unable to control his visions, which become increasingly real and terrifying.

During this period Ada Lovelace (1815-52), daughter of the Romantic poet Lord Byron King, collaborated with Charles Babbage to conceptualize and design a programmable computer. The Analytical Engine, as it was named, would use punched cards to "read" instructions and data for solving mathematical problems.

As a young adult Ada became sick, and (unknowingly) developed an addiction to prescribed drugs including laudanum, morphine, and opium. About laudanum she said, "the drug had a remarkable affect on my eyes, seeming to *free* them, & to make them *open* and *cool*". Opium, on the other hand, made her philosophical, and opened up "vast expanses, orders and harmonies conjured by mathematics."[28]

Ada Lovelace was a brilliant mathematician and a lover of all forms of communication - from the new electrical telegraph system[29] to music, poetry, painting and languages. She was a visionary, and in contrast to Babbage's more sober, practical aims, conceived of a computational machine that could erode the distinction between the "mental and the material", and could generate new fusions and forms of art.

Work for the future

In the 1800s numerous attempts were made to develop instruments for colour-music performances, based on various tone-color correspondence schemes. Electricity opened new possibilities for projected light, which were exploited by inventors like Jameson, Kastner, Bainbridge Bishop and Wallace Rimington.[30] In 1893 Rimington even managed to patent the name 'colour-organ' and had quite some success with his colour-music performances of works by composers such as Bach, Chopin - and Wagner.

In 1849 Wagner proposed the grand idea of a 'Gesamtkunstwerk' (total art work) in his article *The*

27 As quoted in *Writing on drugs*, Sadie Plant, p. 53, published by Picador, 1999, ISBN-0312278748
28 As quoted in *Zeros + Ones*, Sadie Plant, p. 30, published by Fourth Estate Limited, 1997, ISBN - 185702386
29 At the age of 12 she made plans to write a book entitled Flyology about the benefits of flying. She told her mother that she would "be able to fly about with all your letters and messages and shall be able to carry them with much more speed than the post or any other terrestrial contrivances." See *Zeros + Ones*, Sadie Plant, p. 73.
30 In a paper read at St. James's Hall on June 6, 1895, Wallace Rimington decribed his visions of a "New Color Music." His aim was to treat colour in a new way giving it a mobility similar to that of music, and to "place its production under as easy and complete control as the production of sound in Music."

Art-work of the Future. Wagner believed that the future of music, music theatre and all the arts lay in embracing the Gesamtkunstwerk, a fusion of the arts in which "the spectator transplants himself upon the stage, by means of all his visual and aural faculties."[31] Shortly after he put his visions into practice, opened his own theatre and redefined the conventions of Opera.

His ideas influenced the Russian artist Wassily Kandinsky, who reported discovering his personal synaesthesia while attending a performance of a Wagner opera in Moscow:

"The violins, the deep tones of the basses, and especially the wind instruments at that time embodied for me all the power of that pre-nocturnal hour. I saw all my colors in my mind; they stood before my eyes. Wild, almost crazy lines were sketched in front of me."[32]

Of dance and light

The Parisian actress Loïe Fuller was quick to pick up on the new possibilities that electric light could bring to her theatrical work. Switching professions, she moved into the world of dance, devoting her career to the development of stage lighting. In the Paris 1900 World Exhibition she reached large audiences with her *Serpentine and Butterfly* dances. However, she is most famous not for her concrete figurative dances but her abstract dance works. These were based on the expressive qualities of singular colors and how, when beamed onto her specially designed silk costumes created fluid, abstract forms.

Loïe Fuller. Untitled 1905. Courtesy of Jon and Joanne Hendricks. Photo credit: Roger Sinek

31 From *The Art-Work of the Future, IV. Outlines of the Artwork of the Future* by Richard Wagner, 1849. Translated by William Ashton Ellis. Web publication: http://users.belgacom.net/wagnerlibrary/prose/wagartfut.htm

32 From *Kandinsky, 1913/1982*, (p. 364) as quoted by Crétien van Campen in *Synesthesia and Artistic Experimentation,* PSYCHE, 3(6), November 1997, http://psyche.cs.monash.edu.au/v2/psyche-3-06-vancampen.html

New theories for a new century

The German composer Arnold Schönberg (1874-1951) wrote his *Theory of Harmony* in 1911- a new theory of music where a-tonal elements found their place in composition. At the same time Kandinsky proposed his theory *The Spiritual in Art*, a new visual grammar based on abstract imagery, in which he proposed the use of color and geometric point, line and plane.

Kandinsky is often cited as being the champion of the modernist abstract art movement, and drew on his own personal synaesthesia for inspiration. He described the effect of colours as hierarchical, depending on the "level of (spiritual) development" of the individual. People at a low stage of development experienced only fleeting 'superficial' effects due to colour, while those at a higher level experienced "a more profound effect, which occasions a deep emotional response." In such people, colour "call(ed) forth a vibration from the soul." [33] As an analogy to 'pure' sound, 'pure' colour could, in the right people, communicate directly, unmediated by symbolic conventions.

Though he is mostly known for his abstract paintings, Kandinsky explored both harmonious and dissonant relationships between sound[34], light and movement and expressed them in his own opera, *Der Gelbe Klang* (The Yellow Sound, 1912), composed of colour, light, dance, and sound typical of the Gesamtkunstwerk. It was never produced.

"Lend your ears to music, open your eyes to painting, and . . . stop thinking! Just ask yourself whether the work has enabled you to 'walk about' into a hitherto unknown world. If the answer is yes, what more do you want?" he proclaimed in 1910[35], suggesting his desire to push away from the analytical, towards a path more akin to the qualities of synaesthesia that fused himself, his work and public in the direct experience of the moment.[36]

The composer Alexander Scriabin also thought himself to be a Syn, but that his colour-note-system system seems to be based on Sir Isaac Newton's *Optics* rather than a personal synaesthetic palette, suggests otherwise.

There is some mystery and contradiction surrounding both the 1911 (Moscow) and 1915 (New York)

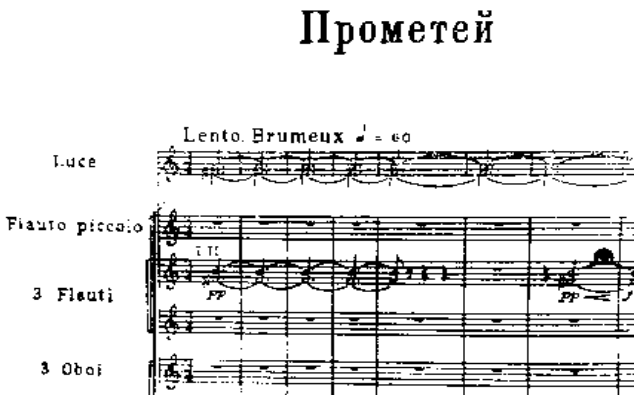
33 From *The Spiritual in Art*, Kandinsky, 1912, as quoted in *Kandinsky Color Theory*, by Evert A. Robles published in 4 ever art e-zine: http://www.evertrobles.com/ezine4-002.htm

34 Kandinsky was heavily influenced by the harmonic of contemporary composers Arnold Schoenberg and Alexander Scriabin who made dissonance and contrast the prime focal point of their pieces.

35 Kandinsky, from *Über Das Geistige. In Der Kunst, Inbesondere In Der Malerei (1910),* as quoted by Richard E. Cytowic, *Synesthesia: Phenomenology And Neuropsychology, A Review of Current Knowledge,* published in PSYCHE, 2(10), July 1995

36 His idea of walking about in a "hitherto unknown world" relate to both backwards in time to the Dioramas of the 1800's, and forwards to the psycho-geography of the Situationists, and the Virtual Reality experiments of the 1990's.

performances of Scriabin's *Prometheus* (described previously), as well as exactly who it was that actually built the colour-organ used in the piece. The first performance of *Prometheus* with the light organ (if it ever took place at all) is frequently reported to have failed, due to a malfunction of the organ. The second performance took place just before his death, and is reported as being a disappointment due to the small scale of the projection surface and the lack of power of the coloured lights to really immerse the audience in the synaesthetic experience. Some sources state that it was the British painter and colour-organ inventor A. Wallace Rimington who built the colour-organ. Other sources quote Preston Miller, the president of the American Illuminating Engineering Society as the inventor. But at the heart of the matter lies the fact Scriabin's ambitions for fusing sound and light were, like Castel's, simply beyond the technology of his time.



The photo on the left shows one of the simplest versions of the ambiguous colour-organ that Scriabin used to conduct his sound and light experiments from 1911. The image to the right shows the beginning of the score of *Prometheus*. The top line notates the light string – or 'Luce'. While this line indicates that light should be played, it does not actually indicate what colours these lights should be! Additionally, the colour-organ itself is too primitive to perform the polyphonic layers that are indicated in the score. [37] [38]

Towards the end of his life Scriabin developed his plans for *Mysterium* envisaged as a week-long performance at the foothills of the Himalayas that: "...synthesize(d) all the arts of sound, sight, scent, and touch, and be performed with orchestra, voice, shafts and columns of constantly changing lights, miming, fragrances, and intoxicating smokes! that would include music, scent, dance, and light!" [39]

37 *The* Luce *part as clue to Scriabin's later harmony*. I. L Vanechkina, musicologist, pianist, Institute Prometei, http://prometheus.kai.ru/luce_e.htm. Institute Prometei is also keen to clear up the mysticism concerning Scriabin's Prometheus. See: *On Performances of Scriabin's Lighting Symphonies*, http://prometheus.kai.ru/perform_e.htm. The 2 images, the light organ and the score are from the Prometei website.

38 The algorithm used for creating *Luce* was apparently fbased on more than 400 modulations of light within 20 minutes of symphony performing were "offensive" for sight.

39 Quote from *Scriabin again and again*, Faubion Bowers, published on ubuweb:

Though it was never realised, he thought that this magnum opus could throw the world off its material course and into a state of bliss.

The fact that Scriabin was both loved and hated for his ideas is reflected in an article by John F. Funican in The Musical Quarterly Magazine (1915) that attempts to play down the fear of critics of Scriabin in England:

During the year 1914 Mr. Scriabine came from Russia to tell and show our English musicians how things should be done; and gratified the fervent interviewer and sent him not empty away. On the contrary he provided him with many yards of copy by talking a great deal of fascinating moonshine about the relation of music to colour and the connection between perfumes and music. Let no man mock him. Any man, native or foreign, who provides a fad for faddists renders humanity a conspicuous service; for your faddist whose mental pockets are empty readily becomes a danger to society. He may take to theosophy, or Bacon-is-Shakespeare, and is as like as not to end by breaking the Sabath. No harm is done by the conversion of a few visionaries to the belief that "through music and colour, and with the aid of perfume, the human mind and soul can be lifted outside or above merely physical sensations into the region of purely abstract ecstasy and purely intellectual speculation." [40]

Both Kandinsky and Scriabin epitomized the almost obsessive tendency to blur the edges between music and the other arts of the early 1900's, in keeping with the spirit of a new age. Artists and commentators from Russia to America were embracing and dabbling in pseudo- religious[41] and -scientific dreams and symbols, enthused by the prospects of a new synthetic experience of art where the material divide between word, image and sound would dissolve into a kind of sexy, spiritual ecstasy that would shake up the body and the very world itself.

Get together …

Art collectives such as the Dadaists, the Futurists and Surrealists aspired to remove themselves from the established art scene by attempting to marry art with everyday life. With different aims they attempted to involve the public in their artworks – *to create sensations and shock them into opening their eyes to a new way of life. Ironically, the art scene embraced their shock treatment as a way of rejuvenating the art scene with these new ideas.* [42]

Synaesthesia on speed …

The counteractions of the Italian Futurists, led by Filippo Tommaso Marinetti sought to celebrate

http://www.ubu.com/aspen/aspen2/scriabin.html

40 From *Noises, Smells and Colours*, John F. Runciman, Musical Quarterly, Vol. 1, No. 2 (Apr., 1915), pp. 149-161

41 Both Kandinsky and Scriabin were influenced by the controversial Madame Blavatsky and her exotic brand of spiritualist philosophy called ***Theosophy***.

42 Annet Dekker, *Synaesthetic performance in the club scene*, Cosign 2003, Computational Semiotics, University of Teeside, Middlesbrough, UK. (www.cosignconference.org/cosign2003/papers/Dekker.pdf)

the technological triumph of man over nature. It was an early 20th century attempt to *reinvent life as it was being transfixed by new technologies and conceive of a new race in the form of machine-extended man*.[43] In 1909 Marinetti exploited the power of the media to spread his ideas by publishing the manifesto *Le Futurisme* first in Milan, and then in the Parisian newspaper *Le Figaro,* even before any new Futurist art existed. The manifesto promoted his ideas about creating a new art 'forged out of the beauty of speed and a glorification of war': *Art, in fact, can be nothing but violence, cruelty, and injustice*, he proclaimed. Further manifestos were published that covered the whole scope of the art disciplines as well as aspects of daily life – food, clothing, smells, war, lust, and so on.

Through their paintings, the Futurists sought to fuse sound, noise and smell believing that to achieve the 'total painting' required the active cooperation of all the sense. In their literary theory they promoted the onomatopoeic, expressive qualities of language, using synaesthesia as a literary device to enhance the profound impact of the work. Words should be projected from the paper like bullets fired from a machine gun. [44]

Inspired by Futurist poetry the painter Luigi Russolo[45] moved his attentions to sound and invented *The Art of Noise*, though he had no formal background in music. He wanted to free music from the limited canvas that cultivated 'pure' sounds had placed on it by drawing on all kinds of sounds – from nature to the sounds of the new urban environments, and "all the noises which are made with the mouth without talking or singing.'[46] An avid amateur scientist, he invented new instruments for his new sound art, experimenting with various materials, old and new techniques, technologies and instruments to build whole orchestras of 'cracklers, roarers, bubblers, thunderers and bursters'.[47]

The Italian Futurists performed their poetry, music, and plays "acting as if they were the Vikings or Hell's Angels of Art, intent in trashing (such) cultivated and stylized aesthetics completely".[48] Their performances sometimes ended in riots, with both public and performers ending up either in hospital or in jail.

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43 Larry Wendt, Narrative as *Genealogy: Sound Sense in an Era of Hypertext*, chp. on Italian Futurism, http://cotati.sjsu.edu/spoetry/

44 The ***mots in liberta*** poetry - word collages that should evoke an uninterrupted flow of new imagery - was void of punctuation, adjectives, or any other literary device that would slow down the immediate effect of the words.
The ***parole in liberta*** poetry attempted to interpret sensory experiences and express confusion and chaos through a cacophony of description, advertising slogans, samples of popular songs, and onomatopoeia.
These ideas were expressed in technical manifestos that included descriptions of four main modes: realistic, analogical, abstract (the 'sound of a state of mind'), and psychic harmony (the fusion of two or three of the abstract representations).

45 He is considered by some as the grandfather of the modern sound movement.

46 As described in his manifesto, *l'arte di rumori,* 1913.

47 This could be a predecessor of Glitch art aesthetics.

48 Michael Kirby, Futurist Performance, with manifestos and playscripts translated from the Italian by Victoria Nes Kirby (New York: E. P. Dutton & Co., Inc., 1971).

An ethereal instrument

In 1927 two young talented people arrived in the United States, namely the Russian physicist and musician Leon Theremin[49] and collaborating violinist Clara Rockmore. Their aim was to demonstrate Theremin's new electronic musical instrument the therminvox (1919), later known as the theremin. [50] [51]

The therminvox is a thermionic tubed instrument with antennas for controlling pitch and a tubular loop for volume control. The antennas and volume control respond to all (bodily) movement, and the performer controls volume and pitch using her hands to interfere with electromagnetic fields generated by the device. Playing the therminvox well demands a co-ordination of 'listening' while performing precise hand movements – particularly because the player must perform without any visual or tactile reference.[52] Speaking in an interview with Robert Moog about the advantages of the theremin compared to the violin, Clara said:

- *Think of a singer that has a basso, mezzo, soprano, and high soprano sing voice that encompasses all the musical ranges. Now this is something that you cannot find in any other instrument. The theremin has a delicacy and an ethereal quality that you can rarely obtain on the violin. There are certain nuances and qualities that you can obtain because you don't have anything in your hand. It really comes out of the air. That's why Prof. Theremin called it the Ether Wave Instrument. There is a certain terrific freedom. You feel like a conductor in front of an orchestra. There is no instrument between you and the music. Sure, there is a theremin standing there, but you're in the electromagnetic field. Every movement you make is a perfect synchronization of sound and motion.* [53]

49 He was actually called Lev Sergeivitch Termen. He adopted the name Leon Theremin when he moved to the United States. In the 1930s Léon Theremin set up a laboratory in New York, where he developed the theremin. He aslo experimented with other electronic musical instruments and inventions, and trained performers.

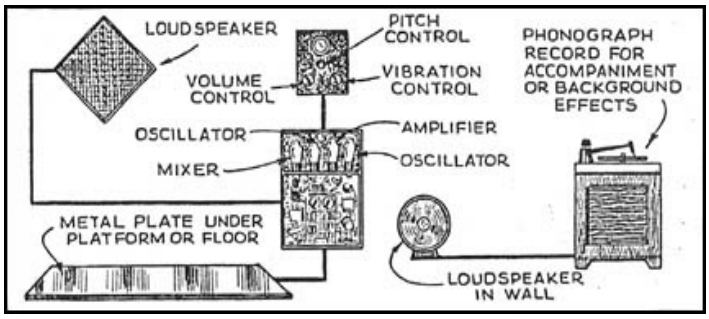
50 The theremin provided inspiration for later engineers of electronic music such as Raymond Scott and Robert Moog.

51 He also invented the Lumivox, Theremin Cello, and the Rhythmicon, and built many instruments specifically for composers, ensembles, or performers. However, the inventions do not stop there. Theremin developed what was at the time the leading patent for mechanical colour television, he invented alarm systems for use in banks and prisons, anti - kidnap devices, and most notoriously 'Buran' (The Bug), with which the Soviet Authorities bugged the American Embassy for many years.

52 *To play the theremin, the performer stands in front of the instrument, a little left of center. The feet are spread slightly to keep the body as motionless as possible. To determine the pitch of the instrument's tone, the player varies the distance between her right hand and the pitch antenna. When the instrument is properly tuned, the pitch goes from lower than two octaves below middle C when the player's right hand is back at her shoulder, to approximately 2 1/2 octaves above middle C when the player's hand barely touches the pitch antenna. To determine the loudness of the instrument's tone, the player varies the distance between her left hand and the middle of the volume antenna. Maximum loudness occurs when the hand is removed from the antenna; complete silence occurs when the hand is an inch or so from the loop.* (From the booklet that accompanies Clara Rockman's CD, "The Art of the Theremin", Delos D/CD 1014)

53 http://www.thereminvox.com/article/articleview/21/1/22/

At one of Theremin's New York concerts in 1932,[54] Clara Rockmore performed on an experimental dance platform called the Terpsitone. The platform was equipped with thereminvox-like antennas, enabling the dancer to play a melody while dancing - the perfect synchronization of sound and motion.[55] [56]



The components of the system, including the phono unit which is used for background effects. (Radio Craft, Dec. 1936, p.365)

Colour-organs and Congresses

Parallel to these activities the invention of colour-organs continued to draw steam. Between 1927-36 the University of Hamburg hosted four international Colour-organ congresses that brought together artists from various disciplines as well as perceptual psychologists and critics to discuss issues of synaesthesia in relation to multidisciplinary artforms. Colour-organ performances included Austrian Count Vietinghoff-Scheel's *Chromatophon* and the *Reflectorial Color Play* by the Bauhaus artists Kurt Schwerdtfeger and Ludwig Hirschfeld-Mack.

With the outbreak of war, many artists fled to the United States, where they competed for attention for their inventions, and battled over patenting issues.

The Danish-born singer Thomas Wilfred built a colour organ, which he called the *Clavilux*, and the art that came out of it, *Lumia*. His emphasis was also fluid movement, on streams of color slowly metamorphosing. His aim was to free the frozen image from the limits of the canvas and set it in

54 In the same year Theremin joined forces with experimental film maker Mary Allen Bute to demonstarte mathematically-based electronic imagery synchronised to music.

55 In the 1960's composer John Cage and choreographer Merce Cunningham experimented with choreographed gesture correspondences to sound using Theremin technology.

56 Kinetic synaesthesia, though rare, has been reported from time to time. Richard Cytowic describes the synaesthetic fusing of sound with motion as "audiomotor" synaesthesia, describing a case study .... *in which an adolescent positioned his body in different postures according to the sounds of different words. Both English and nonsense sounds had certain physical movements, the boy claimed, which he could demonstrate by striking various poses. By way of convincing himself of this sound-to-movement association, the physician who described it planned to re-test the boy later on without warning. When the doctor read the same word list aloud ten years later, the boy assumed, without hesitation, the identical postures of a decade earlier.* (Synesthesia: Phenomenology And Neuropsychology, A Review of Current Knowledge, Richard E. Cytowic 1995 PSYCHE, 2(10), July 1995: http://psyche.cs.monash.edu.au/v2/psyche-2-10-cytowic.html)

motion. He established an Art Institute of Light in New York in 1933, and gave Lumia concerts in throughout the United States and Europe. In the '50s he built *lumia boxes* for home use - self-contained units that resembled television sets that could play continuously without repeating the same imagery.

Thomas Wilfred with the first home Clavilux (1950)[57]

From 1916-34 concert pianist Mary Hallock Greenewalt developed a colour organ, the *Sarabet*, out of her desire to control the ambience in a concert hall, particularly for 'sensitive' music. In her earliest attempts to create an automated machine colored lights were synchronized to records. Not satisfied by the results, she development of an instrument that could actually be played live. Through her experiments with light modulation, she invented the rheostat to make smooth fades of light, as well as the liquid-mercury switch, both of which have become standard electric tools. When others, including Thomas Wilfred, began infringing on her patents for their own demises she tried to sue, but lost her case. The judge ruled that her electrical devices were too complex to have been invented by a woman. However, she continued to perform on her colour-organ, and developed a special notation that could record the intensity and movement of colours of varied musical compositions. She called her art *Nourathar*, adapted from the Arabic words for light (nour), and 'essence of' (athar). Unlike earlier inventors of color-music she did not produce a strict definition of correspondences between specific colors and particular notes, believing that these relationships were inherently variable and reflected the temperament and ability of the performer.

In 1931 an article appeared in the American popular science journal, *Science and Mechanics*, that described a new invention, *The Telecolor.* It took Wilfred's ideas of colour-organs for home use one

57 Imgage from: http://www.awn.com/mag/issue2.1/articles/moritz2.1.html

step further. It drew on another home device, the radio, as a source of sound for producing colour.

LightCOLOR has long been a favorite word to describe the quality and the mood of music; perhaps because some individuals inevitably associate a certain chord with a certain color. This is doubtless only an individual peculiarity; because all people do not match the same music with the same colors. However, a scientific means has been found to turn music into light; and thus make a radio program appeal to the eye (even without television), as well as the ear. The new invention, the "Tele-color" (...) differs from earlier color organs, such as the "clavilux," in being automatic in its actions.

The versatile thyratron tube is again called upon for this purpose, (....) a bank of eight of these; controlling as many groups of lights, which play upon a wall or screen and blend together, through the use of revolving shades. As certain tones or group of tones, dominating the music, come through, an electrical filter separates them; and its output feeds into a thyratron, which releases current to the lamps of its assigned color. A burst of stirring bass notes, such as the drum, is heard; and the filter transmits them to the appropriate thyratron valve, which causes the red lamps to light brilliantly. Thus the colder blues and greens are obscured by the stirring shades of crimson. As the music becomes more tranquil, the red ebbs, and the cooler colors take its place.

The assigned color scheme is based upon these associations: red, exciting; yellow, joyful; green, peaceful; blue, cold; violet, melancholy; and purple, stately. [58]

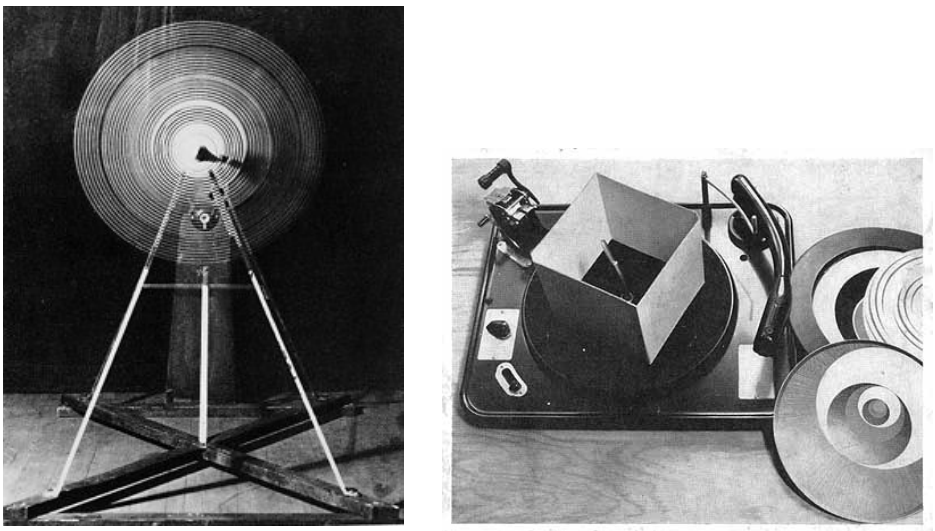
Unfortunately, no reference is given to exactly who it was who invented or produced this remarkable invention.

Duchamp's retinal Rotorelief readymades

To address the problem of how to introduce movement in painting the French artist Marcel Duchamp (1887-1968) constructed a series of machines that used rotating disks to create optical illusions. They were machines in action, simultaneously art objects and retinal experiences that occurred when put in motion. By rotating the disks at different speeds, various visual effects could be achieved, suggesting that the optical illusion was the 'true' image, but also a variable one. His machines first took the form of rotating glass panels on stands. Then, he used a phonograph turntable with a series of hand painted disks that created various visual effects. In 1926 he collaborated with artist Man Ray to explore the notion of cinema as readymade in the film *Anémic Cinéma.* Here he used a series of disks with French puns on them that produced abstract optical illusions when revolved.

58 Science And Mechanics 11-1931, see, http://blog.modernmechanix.com/mags/ScienceAndMechanics/11-1931/telecolor/telecolor_0.jpg

To emphasize his belief in the reconciliation of art and engineering he rented a stand at the invention fair Concours Lépine (Paris, 1935) to display his Rotoreliefs, but his work got little attention amongst the other 'useful' inventions on display. He made an edition of 500 readymades containing both the machine and 6 hand painted disks that could be played according to the user's wishes. As such he placed the creation of the artwork both in the machine and the eye of the beholder. Many of these were lost as a result of World War II, but it is said that 150 or so still remain.



Marcel Duchamp: Rotative Plaques, glass, metal, motor, 1920 (left) and Rototoreliefs, reproduction/reconstruction, 1955 (right). [59]

Absolute film – visual music

Early experiments with sound, light and movement also provided a basis for experimental film making of the time. Film makers from Paris to Moscow built their own instruments to create new techniques for a new cinematographic expression that kept up with the beat of the new century.

One of the most famous of these cinematic pioneers is Oskar Fischinger (1900-1967), often referred to as the master of "absolute" or non-objective film making. "He was cinema's Kandinsky, an animator who, beginning in the 1920's in Germany, created exquisite *visual music* using geometric patterns and shapes choreographed tightly to classical music and jazz." [60]

In the '30s his interested in the synchronization of sound and image also led him to experiment with drawing on the soundtrack section of the film, creating synthetic sound. He later went on to invent a

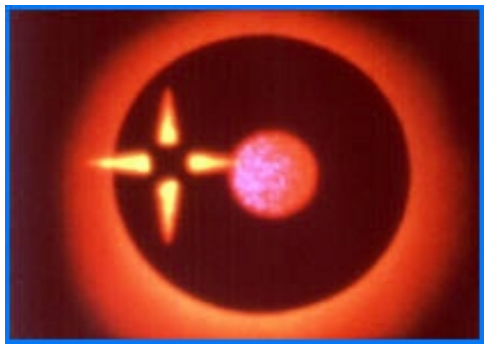
59 Images: © 2001 Succession Marcel Duchamp, ARS, N.Y. / ADAGP, Paris.

60 *The Original Laureate Of an Abstract Poetry*, by John Canemaker, New York Times, July 2, 2000.
Another jazz-ist that is connected to synaesthesia and art is Ken Nordine, though he is rarely mentioned in this context. In his album *Colours* (1966) he gives colour tones personalities through his evocative Word Jazz. I experience Fischinger's films and Nordine's Word Jazz as being closely related.

colour-light instrument of his own, the Lumigraph, in the '50s. [61]

Other early film makers of the pre- and post- WWII period include Man Ray, Walter Ruttman, Hans Richter, Harry Smith, Mary Allen Bute, Jordan Belson and James and John Whitney.

The Whitney brothers created a mechanical pendulum device that allowed for the simultaneous composition of sound and image. Later, John developed a computerized animation camera that they used to create the optically printed film *Yantra* (1950-57). It consisted of animated hand painted dot patterns inspired by James' interests in alchemy and Eastern philosophy. While John continued to make films and develop a program called RDTD to create computer-generated graphics and music, James temporarily gave up film making. He was frustrated by both the limitations of technology and his own inability to transfer the visual image of his 'inner eye' into film. [62]

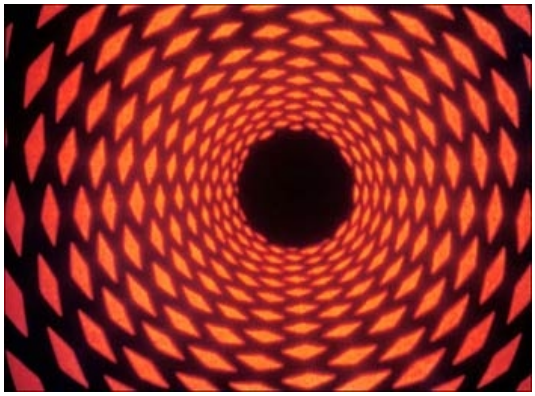


L: Opus 1, 1919, Walter Ruttman
R: Frame from "Circular Tensions: Homage to Oskar Fischinger (1950)", Harry Smith

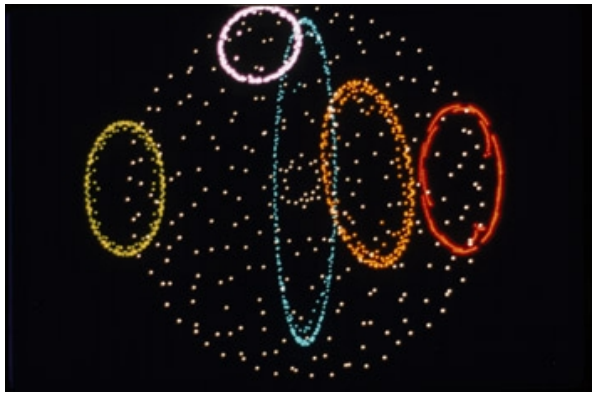
L: Mary Ellen Bute, The Museum of Modern Art/Film Stills Archive
R: *Color Rhapsody (1951) Mary Ellen Bute (Courtesy of William Moritz)*

61 Fischinger's Lumograph was licensed for use in the 1964 sci-fi film, *Time Travelers,* where it was presented as a "Love Machine" that provided a sensual experience for venting sexual urges.

62 See *Visual Music, Synaesthesia in Art and Music Since 1900,* p.260. Published on the occasion of the exhibition *Visual Music*, The museum of Contemporary Art, Los Angeles, May 2005 by Thames and Hudson, ISBN 100500512175.



Allures, Jordan Belson, 1961 (copyright Jordan Belson)



L: Lapis, 1963-66, James Whitney. (Courtesy of The Estate of John and James Whitney)
R: Permutations, 1968, John Whitney. (Courtesy of The Estate of John and James Whitney)

Biorhythms

In contrast to these purely abstract expressions is the work of the Russian film maker Sergei Eisenstein, who, through his experiments in montage and its relationship to biomechanics, found that film cut metrically to the beat of a typical heart has a profound impact on people, precisely because it mirrors our biorhythms. Einsenstein believed that by linking archaic thinking (going back to the biological evolution of man) with sensuous thought, art forms could have the power to capture the viewer, who becomes "doomed to enter the reality of sensuous thought, where he will lose the distinction between subjective and objective, where his capacity to perceive the whole through its part will be heightened (pars pro toto), where colours will be singing and where sounds will acquire shape (synaesthesia), where the word will compel him to react as if the event described by this word did happen in reality (hypnosis)." [63]

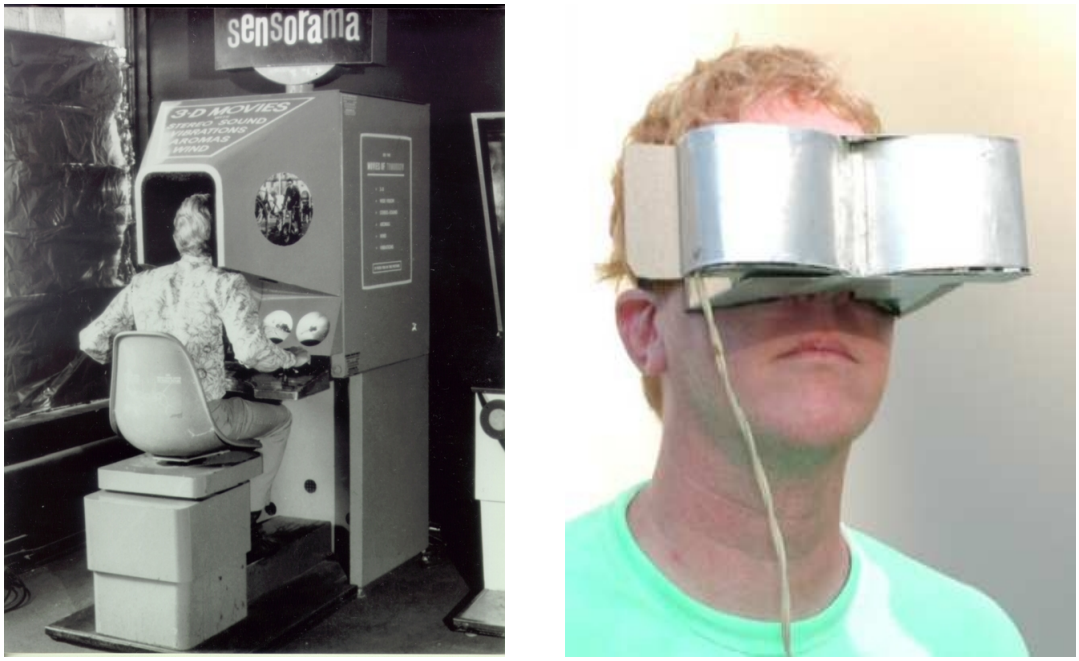
1938 saw the release of his film *Alexander Nevsky*. It combined audio and visual in a unique way, and

63 Eisenstein, in TsGALI,1923, 2-247, as quoted by Julia Vassilieva, Eisenstein and his Method:Recent Publications in Russia, in Sense of Cinema, Julia Vassilieva©2006
http://www.sensesofcinema.com/contents/06/41/eisenstein-method.html

featured extended battle scenes choreographed to the score of Sergei Prokoviev.

Sensoramas, misbehaving organs and reality machines

In the 1950s the American cinematographer Morton Heilig (1926-97) argued that the cinema of the future would use devices capable of stimulating each of the different senses (sight, hearing, taste, touch and smell) in order to reproduce man's outer world as perceived in his consciousness. He claimed that these techniques would allow for experiences unachievable in the natural world. Heilig referred to devices capable of producing this experience as reality machines, which would produce an 'experience theatre'. With this aim in mind Heilig produced his own mechanical machine called the *Sensorama*. It is a simulator for one to four people that provides the illusion of reality using a 3-D motion picture with smell, stereo sound, vibrations of the seat, and wind in the hair to create the illusion. Two other of his inventions, the Sensorama Motion Picture Projector and the Sensorama 3-D Motion Picture Camera, were included in this device. He also invented the first ever head-mounted display, which provides stereoscopic (3D) TV, wide vision and true stereo sound. Although the Sensorama device was reported to be relatively unsuccessful, Heilig's ideas seem to be early thoughts on what would later be referred to as virtual reality.

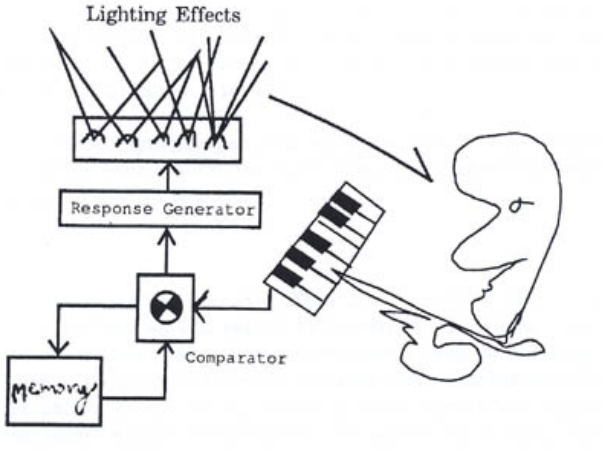


L: The Sensorama
R: The Telesphere mask [64]

In 1953 British cyberneticians Gordon Pask (1928-96) and Robin McKinnon-Wood (1931-95) demonstrated the first of their misbehaving *MusiColour* machines - keyboard instruments that

64 Images from: http://www.mortonheilig.com/InventorVR.html

produced both sound and light. The MusiColour used microphones to pick up sounds form an organ and convert them into an electric signal, which was then processed and used to control a light show. The processing was designed to vary unpredictably in time, so that if the music became too repetitive, the organ got bored and ceased to respond until the player tried something new. Not only that, it could also detect time lags in the performance, and amplify them via the lights for all to see. In the words of sociology Professor Andrew Pickering, "the human part of a Musicolour performance could explore the space of performative possibilities of the machine in a truly open-ended fashion, and the only criterion of stability was itself a locally emergent one, not given in advance; it was just whatever pleased the performer and the audience on some occasion." [65]



Sketch of the MusiColour machine.[66]

The MusiColour performed at various nightclubs, popular music venues and happenings during the '50s and '60s.

In 1958 the new forms of abstract film and European electroacoustic tape-music were shown together in San Francisco's planetarium. The tape-music of Italian Luciano Berio[67] (1925-2003) and German composer, Karlheinz Stockhausen (1928-) were presented with light-effects, and films of American abstract filmmakers (including Jordan Belson) were projected. In the same year, during the World Exhibition in Brussels, the new art forms were presented together in the *Poème Electronique* - a co-production of Swiss French architect Le Corbusier (1887-1965), Greek composer and

65 *Cybernetics and the mangle. Asby, Beer and Pask.* Andrew Pickering. University of Illinois, 2002. (The paper was written for a colloquium held at the Centre Koyré in Paris in May 2000)

66 Image from: http://rhythmiclight.com/archives/timeline.html, (original source: *Cybernetic Serendipity*, Editor, J. Reichardt. Rapp and Carroll, 1970. Reprinted in *Cybernetic Art and Ideas*, Editor, J. Reichadt. London: Studio Vista, 1971, p. 77)

67 Berio's works are often analytic acts: deliberately analyzing myths, stories, the components of words themselves, his own compositions, or preexisting musical works. Other works In other words, it is not only the composition of the "collage" that conveys meaning; it is the particular composition of the component **"sound-image"** that conveys meaning, even extra-musical meaning. (http://en.wikipedia.org/wiki/Luciano_Berio)

architect Iannis Xenakis (1922-2001) and the French-born composer Edgard Varèse for the pavilion of the the Dutch electronics corporation, Phillips. The combined efforts of the artists working closely together with the Phillips engineers created a new experience from which visitors emerged either elated or shaken.

"The pavilion posed a synaesthetic relation between the aural, tactile and visual, overturning modernist divisions of medium specificity. It laid bare modernism's deep debt to a humanist discourse of unified sensation." [68]

Psychedelia = synaesthesia?

In the psychedelic '60s transcendental experiences were pursued, often connected to drugs such as marijuana and LSD, both of which can create a temporary synaesthetic experiences. Notions of fusions of the senses, the arts and art and life returned in full bloom[69], embodied in a new generation bent on experiencing a radically new way of perceiving their world. Especially American artists reacted to the way that science and technology was having a profound effect on society and the environment.

Timothy Leary's famous words 'Tune in, turn on, drop out' became the slogan of the American postwar counter culture generation. He urged people to initiate cultural changes through the use of - and by psychedelics, and to detach themselves from the existing conventions and hierarchies in society.[70]

Wet parties, Tupperware and armory

'High' forms of 'low' art emerged, exemplified in what were called 'Wet Parties' - psychedelic light shows with liquid projections that accompanied rock concerts. They employed a vast array of custom-made film and slide projectors with liquid slides, rotating colour wheels and strobe lights.

68 *Synaesthetic Politics of the Body,* Michelle Kuo, VISIT (http://www.govettbrewster.com/Publications/Visit+Online/1VISIT8.htm)

69 These notions were also strongly contested by some. The influencial Polish theatre director Jerzy Growtowski provided a counteraction to the notion of theatre as a synthesis of art disciplines and created his own theatre laboratory for practicing his principles and training his actors. He maintained that theatre could never compete with cinema, that they both should offer a different experience to the public. He wanted to bring a theatre to an audience that was confronting, challenging and experiential. It was a theatre not based so much on image (as in cinema or television) but on the presence of the actor: "*By gradually eliminating whatever proved superfluous, we found that theatre can exist without make-up, without autonomic costume and scenography, without a separate performance area (stage), without lighting and sound effects, etc. It cannot exist without the spectator relationship of perceptual, direct, communion. This is an ancient theoretical truth, of course, but when rigorously tested in practice it undermines most of our usual ideas about theatre. It challenges the notion of theatre as a synthesis of disparate creative discipline; literature, sculpture, painting. architecture, lighting, acting ....*" (Towards a Poor Theatre. Jerzy Grotowski, Simon & Schuster, 1968, p.19)

70 A common misconception of people not familiar with the context in which it was first said, is that 'turn on, tune in, drop out' refers to 'turn on the radio/television, tune it in, and drop out of your job/society/school', in short, become a 'waster', a delinquent.

With the bare bones of the machinery visible, they united the public, many who were high on hallucinogenics, into one great synaesthetic, cybernetic[71] 'robot'. The Joshua Light Show was one of the most influential visual magicians of these spectacles, originally formed by Joshua White, a film maker with a background in theatre. He collaborated with engineering students Thomas Shoesmith and Bill Shwarzbach. They projected luminous abstractions to the popular music of, amongst others Jimi Hendrix, Frank Zappa and the Mothers of Invention, Janis Joplin, and the Doors.

In 1966 the artist Andy Warhol (1928-87) also managed to close the gap between art and popular music when he let loose the music of *The Velvet Underground & Nico* on the United States in an event called *Exploding Plastics Inevitable (EPI)* at the Dom – a club he ran in Manhattan's East Village. He staged the show using a synergy of lights, projected imagery, smoke and music to immerse the public in what Gene Youngblood, author of the book *Expanded Cinema*, describes as a 'hellish sensorium'. A homage of the event was made by director Ronald Nameth in the style of synaesthetic cinema[72]. Rather than functioning as a mere record of the event, the film attempts to transmit the experience of actually being there - the phenomenal rather than the idea of the show - through the cinematic medium. Made up of a montage of many layers, fragments of images and time distortions, the combination aimed to produce new images and new realities.[73]

In the same year, artist Robert Rauschenberg and engineer Billy Kluver staged a 'happening' [74]

71 "Cybernetics: adj: of cybernetics: a science of control and communication in complex electronic machines like computers and the human nervous system", from Reichardt, J (ed), *Cybernetic Serendipity: The Computer and the Arts* - A Studio International Special Issue, London, 1968, p. 1.

72 The emergence of Synaesthetic Cinema, as described by Gene Youngblood *: "*It has taken more than seventy years for global man to come to terms with the cinematic medium, to liberate it from theatre and literature. We had to wait until our consciousness caught up with our technology. But although the new cinema is the first and only true cinematic language, it still is used as a recording instrument. The recorded subject, however, is not the objective external human condition but the filmmaker's consciousness, his perception and its process. If we've tolerated a certain absence of discipline, it has been in favor of a freedom through which new language hopefully would be developed. With a fusion of aesthetic sensibilities and technological innovation that language finally has been achieved. The new cinema has emerged as the only aesthetic language to match the environment in which we live. Emerging with it is a major paradigm: a conception of the nature of cinema so encompassing and persuasive that it promises to dominate all image-making in much the same way as the theory of general relativity dominates all physics today. I call it synaesthetic cinema." (*Expanded Cinema, Part Two, Synaesthetics Cinema: The End of Drama*, p.76. P Dutton and Co., Inc, New York 1970.)

73 Gene Youngblood, *Expanded Cinema, Synaesthetics and Kinaesthetics: The Way of All Experience*, p.103. P Dutton and Co., Inc, New York 1970.

74 A Happening, a term coined by Allan Kaprow in 1957, was a performance, event or situation meant to be considered as art. Happenings could take place anywhere, were often multi-disciplinary, often lacked a narrative and frequently sought to involve the audience in some way. While key elements of happenings were planned, artists often made space for improvisation. Kaprow's piece *18 Happenings in 6 Parts* (1959) is commonly cited as the first happening, although the first happening is sometimes considered to have been a 1952 performance of *Theater Piece No. 1* at Black Mountain College by John Cage, who was a teacher of Kaprow in the mid-1950s. Accounts of exactly what this performance involved differ, but most agree that Cage recited poetry and read lectures, M. C. Richards read some of her poetry, Robert Rauschenberg showed some of his paintings and played phonograph records, David Tudor performed on a prepared piano and Merce Cunningham danced. All these things took place at the same time, and among the audience rather than on a stage. (From: http://en.wikipedia.org/wiki/Happening)

called *9 Evenings - Theatre and Engineering* that consisted of nine days of performance at the Armory on Lexington Avenue in New York. It immersed the audience in sound, light and projections from both within the space and the world beyond[75]. Artists from disciplines of music, dance, theatre, film and the visual arts (Robert Rauschenberg, John Cage, Yvonne Rainer, Lucinda Childs, Robert Whitman, David Tudor, Øyvind Fahlstrom, and more) worked with teams of engineers to devise completely unrehearsed performances using custom-made technologies. The performance was haunted by glitches and system breakdowns, and the day before the opening Rauschenberg was heard to say that the audience "should understand that we're involved in a process and not in presenting finished products."[76] Though reviews deemed it neither technically or artistically successful, these performances made use of the full range of the live-aspect of electronics in a vast variety of artistic activities.

On TV

By the 1960s an audio/visual mass media broadcasting device, the Television, was a common place item in the homes of people living in the modern world. Reacting against what was considered soulless, manipulative, authoritative and mind-numbing TV content, American artist and engineer Eric Seigel sought to liberate TV through a work he called *Psychedelevision* (1968/69):

"I see television as bringing psychology into the cybernetic twenty-first century. I see television as a psychic healing medium creating mass cosmic consciousness, awakening higher levels of the mind, bringing awareness of the soul." [77]

Psychedelic TV was shown at an exhibition called *TV as a Creative Medium* at the Howard Wise Gallery, New York, in 1969. It also showed a collaborative work by the better known Nam Jun Paik, called *TV Bra for Living Sculpture*, which he made with cellist Charlotte Moorman. It is described as being both an apparatus to be worn and a live performance. By connecting the audio signal to the visual signal Moorman manipulated the images displayed on the two miniature television screens of the

75 Though the event was haunted by breakdowns, frustrations and bad reviews from mainstream critics, Kluver and Rauschenberg defended their work in the spirit of promoting the creation of a new set of values for a new practice. In an interview with Douglas Davis for *Art in America*, Kluver said: "the relationship between art and technology should be experimental and intuitive, in the same sense that scientific research is... and therefore full of risks". (Davis, D, *Art and Technology: Conversations*, Art in America Jan/Feb 1968, USA, p. 41).
A couple of years later, Rauschenberg responded to similar questions by the same author, stating: "Successful is not an artistic consideration. Works and don't works are part of development".
(Davis, D, *Art and the Future: A History/Prophecy of the Collaboration Between Science, Technology and Art*, Thames and Hudson, London and New York, 1973)

76 As quoted in *Engineering marvel*: Branden W. Joseph on Billy Kluver, by Brabdon W. Joseph, Artforum, March 2004.

77 Statement from TV as a creative medium exhibition brochure, http://www.eai.org/kinetic/ch1/creative/pdfs/exhibitionbrochure.pdf

bra Paik designed with the sound of her cello. To explain the motivation for this work, Nam Jun Paik said;

"The real issue between art and technology is not to make yet another scientific toy, but to humanize the technology[78] and the electronic medium - which is progressing rapidly - too rapidly. Progress has already outstripped the ability to program." [79]

Mixed signals and media Gods

Two artists, Steina and Woody Vasulka, visited *TV as a Creative Medium*. Inspired by what they saw, they began their own early feedback experiments with sound and video, borrowing equipment to do so. Although many of their experiments with feedback systems had been done before, there was still a feeling of breaking new ground – of being pioneers, that they shared with other artists of the time.

"Our discovery was a discovery because we discovered it. We didn't know all those people had discovered it before us. It was just like feedback: pointing the camera at the TV set and seeing feedback was an invention that was invented over and over again. As late as 1972, people were inventing feedback, thinking they had just caught the fire of the gods."[80] [81]

Unlike Paik, they were less concerned with creating gallery objects or performing a social critique of the image, but rather with articulating and defining a formal vocabulary which was specific to the electronic image - and developing and sharing tools to do so.[82] They used terms like 'synthesized

78 What better way to humanize technology than to put visual displays on the breasts of a woman!

79 Statement from TV as a creative medium exhibition brochure, http://www.eai.org/kinetic/ch1/creative/pdfs/exhibitionbrochure.pdf

80 *Notes Toward a History of Image-Processed Video: Steina and Woody Vasulka*, by Lucinda Furlong, 1983, Afterimage, Vol. 11, No. 5

81 In 1974 Nam June Paik reflected over the issue of the (re)discovery of feedback like this:
*"*At the turn of the century, when ordinary people thought that they were discovering many new "things", Poincare, French mathematician, remarked that in reality we were discovering only new "relationships" of things already in existence .....the process of "aging" is important not only in the art of "wine making" but also in any non-dualist relationships. When I took a LSD-pill with Yoko Ono back in 1964 ... the most complicate time-relationships of "aging" became visible as simultaneous spatial relationships, as much as Mozart envisaged all four movements of a un-composed string quartet in one split second. So called "feedback", (the) video artist's favorite word, is nothing but the scientific term for "aging" . . . that is : enrichment in time-component or a compounded time. Like any other art, video-art also imitates the nature . . . but in her time-component."
(Nam June Paik, Brussels.1974: http://www.vasulka.org/archive/Artists4/NamJP/KnokkeHeist.pdf)

82 In an interview with Chris Hills in 1992 Woody described the difference between their work and that of Paik:
"We would never take a magnet, like Paik, and place it on a television set. The furniture of television was such a burdensome idea ; we would disregard that as part of our practice whatsoever . . . I would never touch Paik's instruments, which were designed to perform a social critique of the image. He would take a famous person and distort him. It was a Fluxus idea to attack the bourgeois ideal of proper delivery of the image. It was a subversion, a contextual subversion. This would not be permitted in my ethical interests. I'd rather wrestle with the gods . . . so we tried to avoid completely the social context of iconic presentation."
Interview with Woody Vasulka, by Chris Hill, May, 1992, c. 1996 Hill/Vasulka:
http://www.vasulka.org/archive/Contributors/ChrisHill/InterviewWoodyVasulka.pdf)

video' and 'immersive environments' [83] to describe their work, and pioneered the development of low cost video 'tools' working with engineers to build highly specialized devices.

Icelandic Steina (b. 1940) met Czechoslovakian Woody (b. 1937) in Prague when they where both students. Steina studied music, Woody theatre, and later film. They emigrated to the United States in 1965 where they were exposed to (and later became involved in) the various avant-garde activities that were going on. These activities were sometimes referred to as Intermedia and grew out of the mingling dance, theatre, music and film communities.

"We were interested in certain decadent aspects of America, the phenomena of the time - underground rock and roll, homosexual theater, and the rest of the illegitimate culture. In the same way, we were curious about more puritanical concepts of art inspired by (Marshall) McLuhan[84] (on the effects of new media) and Buckminster Fuller (on the power of technology to incite social change). It seemed a strange and unified front - against the establishment."

The Vasulkas were amongst the first of this generation to literally rip apart readymades, or manufactured media systems. Amongst others was the Sony *Portapak* portable video system that allowed for a greater ease (and lesser cost) of the capture and playback of both audio and visuals than film could provide. It also provided a means of capturing events outside the confinements of the studio.

In 1971 the Vasulkas founded *The Kitchen-LATL* (Live Audience Test Laboratory) with Andreas Mannik in Soho in order to continue and extend a collaborative exchange with other artists and activists working with video, sound and performance. Though it started as a place of informal exchange, it quickly became a legend in its own time, presenting screenings, performances and concerts. For the opening of the Kitchen, the Vasulkas' produced the following text:

"This place was selected by Media God to perform an experiment on you, to challenge your brain and its perception. We will present you sounds and images, which we call Electronic Image and Sound Compositions. They can resemble something you remember from dreams or pieces of organic nature, but they never were real objects. They have all been made artificially from various

83 American painter, pioneering and establisher of performance art, Allan Kaprow, used the term 'Environment' in 1958 to describe his transformed indoor spaces.

84 "Today, after more than a century of electric technology, we have extended our central nervous system itself in a global embrace, abolishing both space and time as far as our planet is concerned. Rapidly, we approach the final phase of the extensions of man-the technological simulation of consciousness, when the creative process of knowing will be collectively and corporately extended to the whole of human society, much as we have already extended our senses and our nerves by the various media." Marshall Macluhan, 1964.

frequencies, from sounds, from inaudible pitches and their beats. Accordingly, most of the sounds you will hear are products of images, processed through sound synthesizer. Furthermore, there is time, time to sit down and just surrender. There is no reason to entertain minds anymore, because that has been done and did not help. It just does not help and there is no help anyway. There is just surrender, the way you surrender to the Atlantic Ocean, the way you listen to the wind, or the way you watch the sunset. And that is the time you don't regret that you had nothing else to do." [85]

Throughout the '70s they developed a range of audiovisual tools (or 'machines') built in collaboration with electronic engineers and technicians, including Eric Siegel, whose work they had admired previously. The machines they built allowed for the analysis of electronic image frames and time sequences and employed spatial, temporal and sound/image manipulation, setting a particular vocabulary for image making and creating a new media aesthetic. With Jeffrey Schier, Woody designed and built a system called the *Digital Image Articulator* (a programmable video synthesizer), which processed digital images without requiring a camera or prerecorded image.[86] They were created from 'no material thing', but by 'artifacts' (or glitches) made by raw electronic signals. - By artifacts, Woody explains, "I mean that I have to share the creative process with the machine. These images come to you as they came to me - in a spirit of exploration."

While Woody was occupied with digital imaging processing, Steina, an avid performer, experimented with connecting her acoustic violin to closed-circuit video via a microphone so that when she played the actual movement of her bow affected the video. She used a scan processor to modulate the sound waves so they built up spatial patterns in the visual imagery. Steina called this experimental procedural work *Violin Power* (1970-78), and described it simply as "how to play video with the violin".

Later, in the '90s, she would use a MIDI violin[87] and a video synthesizing computer program called

85 *The Opening of the Kitchen,* June 15, 1971, see:http://www.vasulka.org/archive/Kitchen/KOP/KOP002.pdf

86 "The analytical approach towards defining a video vocabulary can be seen as paralleling the filmic engagement of graphic notation and computer by James and John Whitney—who, in similar ways to Woody, have pursued and analyzed the vocabulary of abstraction. " *Video and Computer: The Aesthetics of Steina and Woody Vasulka,* p.6, Yvonne Spielmann, http://www.fondationlanglois.org/media/activites/vasulka/Spielmann_EN.pdf

87 In the 90's Steina bought a Zeta MIDI (Musical Instrument Digital Interface – the first and only digital protocol to be developed solely for the use of artists) violin to replace the microphone as a way of creating an interface between the violin and video: *The Zeta Violin is a five- stringed electric violin with a MIDI output. The assignment at the moment is that stops on A and E string point to frame locations on the disk. The D and G strings control speed and direction and the C string is a master controller assigned to address segments on the disk. In another programming scheme, the C string controls which upper strings get assigned their function, as I experiment to make the performance more musical.* (Steina Vasulka, *Violin Power: an interactive performance. Description and technical data sheet of the performance Violin Power*, c. 1992. The Daniel Langlois Foundation, Steina and Woody Vasulka fonds, VAS B5—C2.) Steina first performed Violin Power with the Zeta violin using a lazer disk player, and later used the video synthesizing software, Image/ine on a Macintosh computer to allow for more variations in the mappings between sound and image. Image/ine was developed by Tom Demeyer in collaboration with Steina at the

Image/ine to extend the expressive possibilities of her audio/visual performances.

Ecstasy in the '80s – anger in the '90s

During the latter part of the 1980's the Video Jockey (VJ)[88] emerged in the underground House club scene that had already hit Europe. A new synthesized, electronic sound - House Music or Acid House - had been imported from the States, and with it came a drug with the street name Ecstasy, the effects of which include feelings of openness, euphoria, empathy, love, and heightened self-awareness.[89] Ecstasy united the clubbers and ravers on the dance floor, intensifying both the social and musical experience of House parties.

VJs used similar equipment and techniques as other video artists of the time, but differed from them by performing live video mixes made up of many fragments and layers of video clips in an equally live setting. They considered visuals as a means of spreading social messages in social spaces.

In her article, *Synaesthetic Performance In The Club Scene*, Annet Dekker writes:
"With the arrival of cheaper equipment which facilitated the production of visuals, next to the DJ there was also a VJ showing abstract and surreal visuals that reacted to or fused together with the beat. The origins of the House movement lay in a belief, a belief in the self: "It was a personal liberating experience with a slow, primal beat and rhythm. 'My house is your house and your house is mine.' House culture was family." Although the House Movement was very similar to the psychedelic movement in the '60s, life itself had changed, influencing the meaning of these new 'raves'. Taken over by the commercial world, the intentions and feeling of the parties changed. As the parties in the '60s were driven by an inner ideology to broaden self- consciousness, the raves in the '90s were a reaction to a deteriorating society. The raves were a place to get rid of the anger and frustrations of everyday life." [90]

It is the element of live performance, and the immersive effect that fusions of music, visuals, movement, scents, smoke effects, disco lights and Ecstasy produced that leads Dekker to argue that the club scene of the late '80s, early '90s can be considered as a relevant, new setting for synaesthetic

Steim Institute in Amsterdam. It is a fantastic software that I have used considerably in my own work.

88 The term VJ appeared in the early 80's and was used as the name for the girl-boy-next-door MTV music show presenter who introduced both bands and their music videos. The term is used here as an artist who performs live video mixes in a club setting.

89 Taking MDMA or ecstasy is often referred to as popping, rolling, pilling, boshing or dropping in the United Kingdom, 'pinging' or 'peaking' in Australia, 'flipping', 'getting chewed' and/or 'murfing' in Canada or 'thizzing' in Northern California. Some describe the rushing feeling of the drug as blowing up, coming up, flying, rolling face, or zooming.

90 *Synaesthetic Performance In The Club Scene*, Annet Dekker, Netherlands Media Art Institute, Montevideo/Time Based Arts Amsterdam, 2003.

performance art. In her article she describes the circumstances that led up to the emergence of the VJ, drawing from the history of the live image[91] and its connection to sound as a way of enforcing this claim.

In 1996 Fatboy Slim, DJ and English musician in the dance genre[92], released an album called *Better Living through Chemistry* - a direct reference to both attitudes towards Ecstasy, and a reminder of the hippie protests of the '60s.[93] Through minimalist music and lyrics, he expressed what it was like to be a part of the House culture of that time. By the turn of the century commercial interests took over the club scene bringing 'House', as a youth movement, to an end.

MISE EN SCÈNE

1995-2000: Techno-euphoria to dot.com crash

Mise en scène, a term derived from theatre, has been called film criticism's 'grand undefined term', but not because of a lack of definitions[94]. Rather, it is because the term has so many different meanings that there is little consensus about its actual definition. The same can be said of the electronic art scene that emerged in a techno-euphoric frenzy during the mid '90s, and came down to earth at about the same time as the dot.com crash in 2000. In the space of a few years everything merged together - the arts, design, architecture, popular culture, science, technology, entertainment, education, advertising, mass media - in a Wagnerish postmodern crescendo hyped to the extent that it eventually ran out of breath.

This Mise en scène is written in first-person, dérive-style from the memory of my own experiences. It spans a five-year period that had a radical effect on my art practice, and set the stage for my work with synaesthesia.

Just after I completed my diploma in choreography at the National College of Dance in Oslo, I

91 As proposed by Lev Manovich in his articles, lectures and books - such as *The Language of New Media*, The MIT Press, 2001. It is downloadable from his website: http://www.manovich.net/

92 More specifically his style was known as big beat, a combination of hip hop, breakbeat, rock, trance, house and rhythm and blues.

93 The phrase "Better Living Through Chemistry" is a variant of a DuPont advertising slogan, "Better Things for Better Living...Through Chemistry." DuPont adopted it in 1939 and was their slogan until the 1980s when the "Through Chemistry" bit was dropped; in 1999 it was replaced by "The miracles of science". This phrase became popular as culture shifted from mod to hippie in the later half of the 1960s. Protesters would show up for a rally, perhaps to protest a chemical plant, wearing DuPont propaganda buttons, which bore this slogan, while high on LSD, or other synthetic drugs. Protests in the 1960s didn't all revolve around the Vietnam War; Dow Chemical and DuPont were common targets, as people disliked the "artificiality" they represented, not to mention the fact that DuPont did manufacture napalm.

94 Literally it means "setting the scene", but it can mean everything that is put before the camera – props, actors, set, costumes and lighting, or the position and movement of the actors on the set. It can also mean all elements of the visual style, or more mystically, the emotional tone of a film. It can refer to tone, meaning, and narrative information conveyed through mise en scène, where a character's internal state of mind is represented through set design and blocking.

received an unexpected deposit in my bank account. I had previously read an intriguing article about *Life Forms* [95], a computer-compositional tool for developing choreography on a 'virtual' 3D stage, with dancers that looked like stick-people. Though I had no experience in working with computers, I used the money in my account to buy a Macintosh LC computer, a webcam, and a floppy disk with *Life Forms* on it. I then started to experiment with dance – first through Life Forms and then via internet video teleconferencing.

From Life Forms to live art

Following the instructions of the Life Forms program, I found an editor where I manipulated the limbs of a mesh-like figure with my mouse into a desired position. I placed the figure on a selected keyframe in a timeline, and repeated the procedure again, and again, putting new poses in new keyframes. I pushed the space bar on the keyboard and watched the computer generate movement between the keyframes on the 3D stage. I added a sound file to the timeline and watched the serendipitous connections between sound and movement. A new space seemed to open up behind the flat surface of the screen. It was the first time that I felt such an intimate kinaesthetic[96] connection with a technological construct. I could save sequences of positions and movements in data banks (a new concept for me) and recall and re-edit them later in new sequences. However, I could not control the way the movement was rendered between the frames. It was the default algorithms of zeros and ones that did that. At first it was fascinating, to see things that were impossible to envisage and perform in real life, but gradually the fascination wore off. It just wasn't lively enough.

While I transfered some of this work on real dancers, I spent more time experimenting with dancing to the awry sound of the internet band *Nood* (aka Per Platou and Ulf Knudsen)[97], who were jamming with the acoustic sound of the net with their friends. They used, amongst other 'free' software (e.g.

95 Life forms was developed by, amongst others, the computer media artist, dancer and choreographer, Thecla Schiphorst at the Simon Fraser University in Canada. I was interested in it because Thecla worked closely to the world famous choreographer of chance events, Merce Cunningham and supported the creation of his new dances with Life Forms. (Cunningham's most famous with Life Forms in the 1999 production Bipeds. It used state of the art projection techniques where Life Forms-animated dancers seemed to appear on the same stage as real dancers.) I first met Thecla at the 5th International Conference on Cyberspace in Madrid, where I became familiar with her interactive installation *Body Maps, artefacts.*

96 Kinaesthesia is the awareness of the position and movement of the parts of the body as registered via sensory organs (proprioceptors) in the muscles and joints. It is the controversial 6th sense that can give feedback about heaviness and temperature and can tell you where an injury is located inside your body. Kinaesthetics is the appreciation of such an awareness – such as can be felt in dance, or by watching others move. I think it is very closely related to synaesthesia and synaesthetics.

97 Nood was initiated by Per Platou and Ulf Knudsen in 1995 through their interest in the acoustic sound of the net. They developed methods of combining social software tools such as CU-SeeMe, real audio, FTP, email, IRC and the telephone and methods of sampling, looping and jamming with sounds in realtime.

IRC internet relay chat, MOOs[98] and RealAudio), CU-SeeMe video teleconferencing[99] as a social performance space while surfing on the live sound of the net using samplers, mixers, acoustic instruments and telephones.

Test pilots of the technological stone age

Screenshot of the computer at the Res Rocket Surfer Headquarters in London during the Cologne gig of Nood's Virtual Tour, 1995.

Taking part in these sessions felt like going to a House party without having to go out, and you never knew who was going to drop in. With low-bandwidth modem connections, it was a challenge to keep sound and image in sync. A delay in one part of the network caused a butterfly effect of disruptions, and it was impossible to know exactly what others heard or saw. To get a feeling of the delay in transmission rates 'ping' tests were performed that measured the echo times between signals and relayed them as ping-sounds. Video images became jerky and pixilated, sounds crackled up. Connections were broken and computers crashed. It was a glitchy primitive expression, but with a strong sense of connection in a special addictive, clandestine dream-like zone. Tuning in to the sliding of time was the aim of the game. When sound and image seemed to be in sync it felt like ecstasy on speed. While experimenting in CU-SeeMe I encountered anonymous flashers and masturbators who frequently lurked in cyberspace, and as a result I developed a persona called M@ggie, arming her with a plunger to protect herself. It is a strange idea, but it made sense at the time. The plunger was a tongue-in-cheek symbol of binary transgender empowerment. The suction

98 A text-based chatroom with different imaginary 'rooms', such as a bar where you could order strange drinks that made you 'drunk' - changing the way your text was shown.
99 For an overview of the CU-SeeMe project, see http://myhome.hanafos.com/~soonjp/project.html

cup was the feminine identifier, and the shaft was the masculine one![100]

L: M@ggie, C: zero/feminine R: one/masculine :-D

In 1996 *M@ggie* and *Nood* (and our extended network) put on a show called *M@ggie's Love Bytes*, described as a 'postmodem' split location dance theatre jam. It was shown during *Electra*, the first and largest Scandinavian exhibition of electronic art at the Henie Onstad Arts Centre just outside Oslo. Using techniques described above, we directed the show from two computers, and projected their desktops onto a large wall. Three web cams offered different perspectives of our space, and three dancers and an actress[101] were brought in as additional M@ggie-clones. Participants from three continents logged in, contributing with 'love bytes' of sounds and images and continuous chat-texts that were played and projected on the wall. The viewers could see M@ggie respond on their own screens, and send new responses to the dancers. This direct and almost synchronous, two-way communication evoked a strong sense of participation. To let the in-house audience know that what we were doing was happening in the moment, musician Aric Rubin, coming in from San Francisco, was prompted to perform a guitar solo over the telephone. The audience could see him dialing the number on the wall and hear him over the sound system. A couple of glitches, crashes, restarted modems and computers should have helped out too, but despite our efforts, some still thought the imagery on the wall was recorded video.

100 I practiced by logging on to different CU-SeeMe spaces, or reflectors, hosted by schools, office spaces, bands and for a brief period, the space Mir, which was open for two-way communication for a period of about two weeks. After that it was only possible to look in. I can find no documentation of this, but I remember that the reason given by NASA was that being shut up in a confined space with Russians, the American astronauts missed communicating in their own language! When the dual connection was shut down it felt like being both ground control and Major Tom at the same time: *Ground control to Major Tom, Your circuit's dead, there's something wrong, Can you hear me, Major Tom? Can you hear me, Major Tom? Can you hear me, Major Tom? Can you.... Here am I floating round my tin can. Far above the moon. Planet earth is blue. And there's nothing I can do*. - David Bowie, *Space Oddity,* 1969.

101 The dancers were Kristine Øren, Snelle Hall and Siri Jøntvedt, and the actress Kate Pendry. Kate devised an improvisational monologue for the piece about the pleasures of drilling a hole in your head.

What was important was to use the restrictions of the technology creatively. Not to glorify it, but to show the low-tech reality of the super-hyped 'information superhighway' and make explicit the discrete connection felt with others online. It was in this indescribable psychedelic, imagined and physical space-between-time-and-place experience that something verging on synaesthesia happened. For those who participated, the show was an adrenalin kick of chaos and unpredictability. For the uninitiated, it could be a confusing and undecipherable experience. With the process laid bare for all to see, we were practicing live art while performing it, with limited control over the results.

Through this performance I founded the art collective *Motherboard* with Per Platou. The performance received a good deal of attention from the media, and we started to become part of a larger electronic arts scene, participating in conferences and festivals organised by smaller collectives and large institutions. Through these events I became more familiar with the various discourses of the electronic art scene, from the optimistic, archetypically American view of emerging technologies and their power to improve and transform future life on earth, to the more critical, archetypically European perspective.

While several installations I experienced bared a strong resemblance and reference to ideas mentioned previously - such as neo-oriental panoramic video installations that transported the viewer to 'other worlds', there are two aspects of this period that are particularly relevant to my journey through synaesthesia and art.

Firstly affordable software designed for, and by, artists. Examples include Tom Demeyer's Imagine/ine - the first software for personal computers that allowed uncompressed video to be manipulated in realtime, and designed for video artists rather than musicians or programmers - and Big Eye[102]. Big Eye takes video information and converts it into MIDI messages. Based on color

102 For many years Tom worked at the Steim Institute in Amsterdam, and then later at the Waag/Centre for old and new media where he became part of the KeyStroke team.

information or a 'reference image' it tracks objects through space, converting their parameters into MIDI signals that can manipulate visual source material in a live performance environment. (I particularly mention these because they are the ones I used in my work.)

Secondly, artworks that attempted to transmit explicit sensations to the public, and show how the internet was affecting the way people thought about modes of communication (how machine code, media, the senses and imagination had become intertwined). As fingers replaced lips, it was the perceptions of the touchers that were at stake – tactile hearing, audio vision, sensational interplay.[103]

Below are a selection of artworks that I have divided into three main groups:

Futuristic fantasy discourses

These dealt with the question of whether cybernetic sensations would take over from, and radically alter the traditional psychosomatic experience of the senses' ability to register pleasure and pain. Here the body was laid bare on the alter of technology. An example is the Australian art collective *VNS Matrix* who, from 1991, created works that sought to appropriate the language of computer technology and the imaging of cyberpunk. Their aim was to "(re)structure female sexuality through a futuristic fantasy discourse which encodes the clitoris as a laser beam 'phallus', a signifier of power and a direct on-line connection." [104] Their work has included computer games, installations and text.[105]

An example of direct physical stimulation is the Stenslie/Woolford c*yber S/M* project (1993) where two anonymous users could directly stimulate each others body-parts via fullbody suits connected to telephone lines. A computer screen in each location provided a graphic selection of 'perfect' cyber-body parts to choose from.

The most extreme example is the Australian artist Stelarc's *'ping body'* project. It was about 'The Obsolete Body' and 'alternate, intimate and involuntary experiences' - qualities that can be considered analogous to some of the clinical diagnosis of synaesthesia, but are in this case more

103 "Color is the keyboard, the eyes are the hammers, the soul is the piano with many strings. The artist is the hand that plays, touching one key or another purposely, to cause vibrations in the soul." In retrospect Kandinsky's comment seems to refer to these attempts, but calling from another time. -W. Kandinsky, *The Effect of Color*, 1911

104 "Slimy metaphors for technology: 'the clitoris is a direct line to the Matrix' " Dr. Jyanni Steffensen, 1998. Presented at a conference at Duke University, Durham, North Carolina entitled "Discipline and Deviance: Technology, Gender, Machines", 1998 http://www.ensemble.va.com.au/array/steff.html

105 "We are the modern cunt, positive anti reason, unbounded unleashed unforgiving, we see art with our cunt we make art with our cunt, we believe in jouissance madness holiness and poetry, we are the virus of the new world disorder, rupturing the symbolic from within, saboteurs of big daddy mainframe, the clitoris is a direct line to the matrix, VNS MATRIX, terminators of the moral codes, mercenaries of slime, go down on the altar of abjection, probing the visceral temple we speak in tongues, infiltrating disrupting disseminating, corrupting the discourse, we are the future cunt." *The Cyberfeminist Manifesto*, VNS Matrix, 1991.

related to anesthesia (without senses).

In *'ping body* his near-naked body was encased in circuitry, forming an external nervous system that functioned in a feedback loop with his biological systems. Audience members could log on to a website where they could actuate (electrocute) Stelarc 'as body' via a computer-interfaced-muscle-stimulation system based at the main performance site. By randomly 'pinging' to internet domains, spatial distance and transmission time was mapped onto body motion. 'Ping values' were used to activate a multiple muscle stimulator directing 0-60 volts to Stelarc's body that consequently performed an involuntary, spasmodic choreography[106]. His movements (registered by sensors on his arms and legs) simultaneously generated sounds mapped to proximity, positioning and bending of his arms and legs that were controlled, not by him, but by a prosthetic third arm. A *'ping Body* performance could last for as long as 4 hours, and would occasionally result in Stelarc having a seizure, at which point the electrical input would be temporarily turned off. However, unknown to the audience, Stelarc continued to perform by faking the spasms for the sake of performance. For an uninitiated audience Stelarc's dance seemed senseless.[107]

Today Stelarc is undertaking a project that puts his body under even more pressure by attempting to graft a partly constructed, partly grown quarter-sized ear onto his arm, which I think is a very synaesthetic idea.

Stelarc, Extra ear – 1/4 scale (in collaboration with Tissue Culture & Art), 2003

106 On his website Stelarc explains that "although the body's movements were involuntary, it could respond by activating its robotic Third Hand and also trigger the upload of images to a website so that the performance could be monitored live on the Net."

107 While I think Stelarc was trying to make a point here, this was the problem with many of the interactive installations and performances of the 1990s. They just didn't feel interactive.

Soft-sensual telematic installations that reflect a synaesthesia of hand and eye.
These include Paul Sermon's *Telematic Dreaming* (1992) and Techla Schiphorst's *Bodymaps. Artifacts of Mortality* (1996).

Telematic Dreaming played with the ambiguous connotations of a bed as telepresence projection surface to evoke an uncanny feeling of intimacy that can be experienced when people communicate remotely. Visitors could lie on beds in two separate rooms connected by an ISDN video-teleconferencing system. Combining video images of the beds in the two rooms created a mirroring effect reflecting one person within another person's reflection so that people could 'touch' each other's image. It created an uncanny synaesthesia of hand and eye.

Bodymaps. Artifacts of Mortality consisted of a platform covered in white velvet onto which video of Thecla's own body was projected. By stroking and caressing the velvet, it would shudder, roll, fragment, be consumed by flames, drown, die and re-awaken, accompanied by sounds of water, fire and wind. Drawing on the archetypal elements of nature, it create an immersive and almost sacral experience that was far from removed from the typically more concept-based, gaming-like installations of the time, and was one of the few works that was described by the artist in terms of synaesthesia.

Installation as instrument. Sound objects becoming visual and tactile objects.
The last example, *Simulationsraum-Mosaik mobiler Datenklänge* (SMDK, 1993) by the cross-disciplinary group Knowbotic Research (made up of media artists, computer musicians and computer scientists) is more abstract. Here the public are not required to view another body, or body-representation. The results of the actions of the public inside the installation can be seen and heard by those outside. For this installation sounds deposited in a databank were analyzed by a computer, organised into groups and given corresponding computer generated geometric shapes. On entering the dark space visitors were given a hand sensor and an eye monitor. They could see and hear the sounds around them, and reach out, touch and manipulate them in the computerized space they had become a part of. Similar shaped sounds would seek each other out in a self-organising way. Visitors could divide the audio-visual clusters up by their hand movements causing various effects. Fast movements created louder volume, and keeping groups together produced more stability in the soundscape. Rotating the hand sensor caused different spatial relationships. The 'active space', the space where sounds could be manipulated, was about 25cm in radius from the position of the sensor, but appeared much larger in its virtual rendition both on the eye monitor, and on a larger screen placed at the entrance door for all to see.

Arrivè 2000

In January 2000 Motherboard invited sixteen artists to take part in a two-week international cross-disciplinary worklab and performance event called *Hot Wired Live Art* at BEK (Bergen Centre for Electronic Art). The aim was to beta-test a new experimental software project, *KeyStroke*[108], and to devise networked strategies for live art through the process of collective experimentation and play. According to the website at that time, KeyStroke is "an application through which image, sound, text and animation can be created and manipulated live on the Internet. It is a multi-user tool and can be used by professional artists as well as others interested. It is possible for instance to have a jam session between a visual artist and a musician in the same place, or with a DJ and a VJ at different locations. KeyStroke is inspired by the notion of synaesthesia; to hear images and see sound." [109]

To expand on this description with a hypothetic example, using a shared 'canvas' a person in place 1 (P1) could create a red circle. A person in place 2 (P2) could use their mouse to dynamically change the size and hue of the circle. A third person in yet another physical location (P3) could swap P2's mouse-control of the size of the circle with their own joystick-control, and use it to modify the hue and position of the circle as well. P1 could then use a video tracking module to capture the x, y position of the circle, and use these parameters to generate and modify the frequency of a tone (and so on), and all without having to say a word. The fluctuation of transmission rates of signals passing back and forth added an extra time-filter to the experience. It is a complicated thing to describe, but an intuitive thing to do, which was just what Motherboard had been looking for since 1996. Basically, anything that could be digitized, or digitally addressed could be modified and manipulated by any participator, at any time during a jam session and from anywhere with an internet connection (such as data generated by the computer keyboard, sensors, microphones, video cameras, MIDI keyboards, joysticks, live audio/video streams, data banks of images and sounds, texts, and so on.)

For HWLA it was the ultimate, synaesthetic, experimental, networked performance feedback engine. A large open workspace was provided, equipped with an array of hard- and software for media production and streaming, as well as various other tools and materials. Each day started with fencing lessons given by a Norwegian equivalent of Zorro. They provided a kick-start for the senses, and an

108 KeyStroke was developed at the Waag/Centre for old and new media in Amsterdam. The project was led by Sher Doruff, and amongst the team were programmer and musician Niels Bogaards and Tom Demeyer. Both Sher and Niels took part in HWLA1, and later HWLA2 at the Banff Centre for the Arts in Canada. The original KeyStroke project is now over, and at some point KeyStroke changed name to KeyWorx, and is currently being ported to a Linux/Open Source platform. It can still be downloaded without cost at: http://www.keyworx.org/apps.php.

109 Basically it consists of three parts, a 'Patcher' (or graphical user interface) for mapping, assembling and manipulating digitized inputs and outputs, a 'Realizer' where these mappings are outputted, and a server that allows these to be shared by participants.

embodied metaphor for working in a shared environment where group dynamics are of essence. The mask hid facial expressions, the sword tip was the only physical point of contact, and the rules provided a frame for getting a feeling for how to meet, when to initiate, when to follow, and when to back down (gracefully). Throughout the two weeks sounds and texts became projected shapes and colours. They were modulated by bodies, lights and remote-controlled helium ships that generated more imagery, sounds, and metaphoric and concrete parries and couterpoints. Long working days ended in parties in the environments that were devised.On the last evening we opened up the space for the public to join us in a social, live art event where guests could also participate via the internet.[110] Through this worklab strong bonds were formed that led to future collaborations.[111]

Though I rarely use KeyWorx on an internet-work these days[112], I do use it in my both in my own art works, as a prototyping tool, and in teaching situations.

From Zeotropes to Nintendos [113]

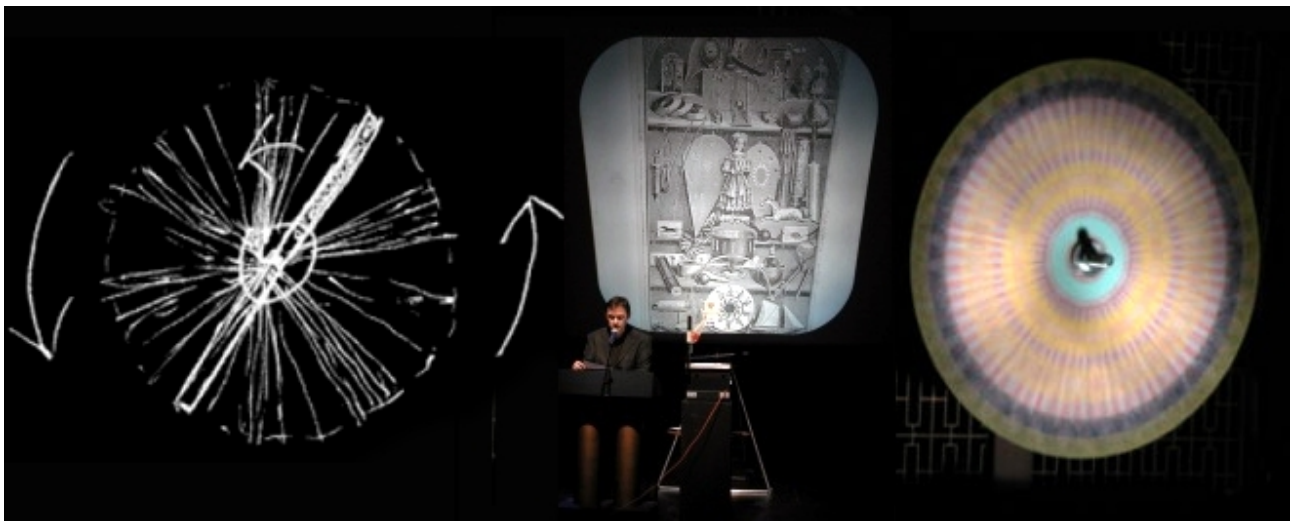
Joost Rekveld (NL) is an artist who has conducted considerable reserch into media machines and ideas of the past to create his personalised, expressive media machines. During the DEAF00 festival organized by the V2 Institute for unstable media in Rotterdam, he gave a presentation entitled *An evening of .... Joost Rekveld* where he described the emergence of moving image media in the 20th century through the lens of past research into the human visual perception of movement and attempts to capture motion patterns. His evening was made up of four separate presentations and performances: a lecture by Edwin Carels on *Plateau, Duchamp and the Machine Célibataire,* two performances/installations - *The Strob-Optical Machine* by Bruce McClure, Norbert Schliewe's *Die Luft über dem Toaster*, and his own performance *#19* with live-music by Edwin van der Heide.

110 Per Platou and dance technology researcher/dancer/choreographer Scott deLahunta got so involved in the fencing that one of them broke the rib of the other, though for the life of me I can't remember who was injured. I think it was Per.

111 In 2001 HWLA2 took place at the Banff Centre for the Arts, Canada, organised by Michelle Teran. The emphasis of the work shifted to mobile devices, wireless networks and interventions of both Banff and the rocky mountainous space surrounding the centre. It culminated in a social performance event, where the New Media theorist Lev Manovich, caught up in the event, spontaneously sprayed everyone with aftershave lotion and declared that he too wanted to become a hot wired live artist. Such is live art. You never know what's going to happen.

112 For me at least, that activity belonged to a special time that seems to have passed by. I now think networked performance is most potent in politically heated situations where information needs to be got out of otherwise restricted/censored zones.

113 The three projects in this category all directly relate to what Erkki Huhtamo refers to as *Media Archaeology*. In his work he approaches the topic of Media Art history by looking at the media hard- and software of the past from the perspective of the social situations they emerged from (hopes, dreams, fears, desires, etc), and finds interesting correspondencies to related tendencies in modern times. To hear (and see) Huhtamo speak about his ideas, see: *In the end the interface is a political issue*, a video interview from 2006, published on the Artnodes website: http://www.uoc.edu/artnodes/eng/art/huhtamo.html



Photos from An Evening of .... Joost Rekveld.

Each artist presented their personal approach to constructing media today through the gaze of the pre-cinematic innovations of the past. It was an evening of whizzing, whirring, popping and screaming phenakistoscopes [114]and other strange devices. Fusion of sounds and images of the machines in action, tricking the eyes with stunning optical illusions.

Japanese Toshio Iwai is an example of an artist who managed to integrate his artistic work of the 20th Century with commercial enterprise in the 21st. During the 1980s he began creating installations that combined pre-cinema techniques (such as the zoetrope[115] and phenakistoscope) with modern techniques of image creation and production. In the 1990s his work became increasingly focused on relationships between sound and image, using interactivity, gestural interfaces and generative, aleatory music[116].

In *Piano – As Image Media* (1995) audience members played a piano by using a trackball to draw moving light-dots on a grid. When the dots came close to the piano they accelerate and strike a key. With the sound of the piano, a 3D figure seemed to pop out of the keyboard. The sound of the acoustic, computer-controlled piano consequently produced more colors and figures.

114 The word "phenakistoscope" comes from Greek roots meaning "deceiving viewer". The phenakistoscope is a hand held device from the 1830's for viewing animations, based on a vertically mounted disk with hand-drawn animation "frames" placed around the centre. Around its circumference are slits. The viewer spins the disk and looks through the moving slits at reflections of the disk on a mirror. The scanning of the slits across the reflected images keeps the still images from simply blurring together, so that the user sees a rapid succession of images, giving the appearance of a moving image.

115 The zoetrope is a cylindrical device from the 1930's where still images inside the cylinder are viewed via vertical slits on the outside. As the cylinder spins the rapid succession of still images produces an equivalent to motion image. The slits prevent the images from becoming blurred together.

116 In Aleatoric (or chance) music some element of the composition is left to chance, or an element of a composed work's realization is left up to its performer(s).

L: Piano - As Image Media, Toshio Iwai, 1995. Installation view at galerie deux, Tokyo 1998.
R: Electroplankton, Nintendo DS sound toy, Toshio Iwai, 2005.

Toshio Iwai became one of the first internationally recognized artists to lead the creation of a number of commercial videogame projects. For the Nintendo DS he created *Electroplankton*, released in Japan in 2005. It consists of a suite of ten different interactive music and audio toys themed around cartoon plankton that used the touchscreen and microphone interface features of the gaming console.

Manual hand input

In a similar, playful vein, speaking at the GeneratorX conference in Oslo (2005) Golan Levin (US) described his *Manual Input Sessions*, a series of audiovisual concert vignettes developed in 2004 with Zachary Lieberman. They explore the expressive possibilities of hand gestures and finger movements. Using custom made software and overlapping analogue overhead and digital video projectors, hybrid light shapes and corresponding sounds are generated by silhouettes of hands. When speaking at the Sonic Acts XI Symposium and festival in Amsterdam in 2006, he pulled two computers out of his bag to give a hands-on demonstration of this work. He placed his hand above the overhead projector and formed an "0" shape with his index finger and thumb, causing its silhouette to appear on a large screen behind him. The hand was black, the background, pink, and the hole in the middle, white. The luminous image was accompanied with a quirky tone. As he opened his finger and thumb the white hole-shape dropped out of place on the screen, not once, but like a series of snowballs, and with each shape came a new tone. Throughout his presentation he showed how different shapes could cause different sound effects, and described his attention to behaviour when designing his systems. Synaesthesia was an inspiration, behaviourism the method, and it seemed to work. The layers of analogue and digital projections produced an unusual quality of light – somehow out of focus, and yet quite sharp, with a strong sense of connection between

gesture, image and sound. At times the public laughed in unison like a group of children watching their favourite cartoon, not stopping to think why.

This synaesthesia in art - what is it good for?

When I wrote my project description for *Mind, the Gap* in 2004 the questions I posed related to artistic concerns of how to create a "successful synaesthetic work", and who should define the success - the artist or the audience. I also posed questions about the relationship between time and space in synaesthetic works, my mind working in a choreographic mode.

Over a year later I had added a couple of questions related to true and synthesized synaesthetic experiences, especially in relation to synaesthesia created by artistic intention. My first version of one of these questions went like this:

Is it possible to evoke, even for a moment, an experience comparable to real synaesthesia, a gesamtkunstwerk of emotional impact and perceptual transcendence - without using psychedelic drugs?[117]

Later I took out the *gesamtkunstwerk*, the *emotional impact* and *perceptual transcendence* bits. Though I regarded this question as a performative one – as a question that would raise some eyebrows and cause some debate and attention for my project[118], I was not actually sure what I aimed to get from it.

It has been disturbing me ever since.

What I should probably have been asking is; what good is this synaesthetic probing of senses and materials, of self and world? It could be, as suggested by Michelle Kuo[119], that it has served as an escape from an administrated, regulated society. The utopian vision of a one code-fits-all, universal language (that has often connected synaesthesia to spiritualism) in a nostalgic and, at its most extreme, totalitarian vision. On the other hand, she says it could serve as a way of revealing how probing into aesthetic materials and the corporeality of the body can reveal how they have been mediated, modulated and commodified by technocratic means. She also writes that "(the) postwar rediscovery of synaesthesia revives the ambivalence of mass ornament and its latent possibilities for sensing truth in surface."

117 I do think that taking psychedelic drugs is the only foolproof way of experiencing synaesthesia if you don't have it.
118 The only time this strategy has worked for me was when I presented my project at The Uk Synaesthesia Association Annual conference meeting.
119 *Synaesthetic Politics of the Body*, Michelle Kuo, http://www.govettbrewster.com/Publications/Visit+Online/1VISIT8.htm

Rather than sensing the truth, artists today are as equally interested in exploring digital and communications technologies as sensuous transducers of experiences. “The increasing interest in ‘sensorial art’ and synaesthetics is believed to be a counter action towards the digitalisation of our society and the increased use of technology in art. Yet, elaborate works like ‘Tickle Salon’ by Erwin Driessens and Maria Verstappen and DJ/VJ performances in clubs, where music, visuals, smoke and smells create a synaesthetic performance, show that an immediate, bodily, sensorial aesthetic experience is enforced by means of digital technology. A supreme experience that echo’s Romantic aspirations but is truly a product of our own time and age, employing state of the art technologies within contemporary artistic practice.” (Annet Dekker, *Sensational Technologies*, 2004).

Despite state of the art technologies I still have to lift up my clothing and feel the cold, metal stethoscope on my body when I visit the doctor with chest complaints. My pulse is still tested by warm fingers placed over the veins on my wrists as my doctor looks at his wrist watch to register the intervals of my heartbeats. For my own part, I do not wear a watch because I don't like to have such a direct physical connection to the metric passing of time. Still, I like to hold analogue watches close to my ear. Hearing the watch ticking away time while feeling the vibrations of the mechanical parts in motion resonating inside my body, causing an interplay with my own biological pacemaker. Mechanical watches need to be rewound or kept in motion to keep time from slowing down, or stopping completely. They are a reminder that metric time is not a universally accepted concept. The art works that I am most content with are those that I can sense in the present, but have a certain ambiguous relationship to time.

In my opinion synaesthesia works best as a suggestive anomaly, which is quite paradoxical when you consider how many analogous activities between seemingly disparate domains it has inspired over the centuries. I think it is the glitch that has run through the web of the usual order of things that caused Dick Higgins to remark that he could not “name a work which has consciously been placed in the intermedium between painting and shoes” in 1965,[120] [121] and Gary Hill to make *Why do things get in a muddle? (Come on Petunia)* in 1984.

Below is a description of this work by curators of the exhibition *Say Hello to Peace and Tranquility*[122]: “Gregory Bateson approached the problems of language, meaning, order and disorder in his 1948

120 *Synesthesia and Intersenses: Intermedia.* Dick Higgins (with an Appendix by Hannah Higgins). Originally published in Something Else Newsletter 1, No. 1 (Something Else Press, 1966). Also published as a chapter in Dick Higgins, Horizons, the Poetics and Theory of the Intermedia (Carbondale, IL: Southern Illinois Univ. Press, 1984).

121 I would love to send him the *The Seven Mile Boots* for Christmas - bright red and beautiful wearable networked boots created by Beloff, Berger and Pichlmair, 2003-04. (http://randomseed.org/sevenmileboots/)

122 Hans D. Christ, Iris Dressler, Jan Schuijren, Montevideo, March 2002

work *Metalogues* by creating a fictional dialogue between a father and his daughter. "*Why Do Things Get In A Muddle?*" is the daughter's apparently naïve, yet central question. Gary Hill picked up this question in his 1984 (48/84!) video of the same title and circulates it throughout the dialogue between a professorial father and his daughter, who not coincidentally reminds the viewer of Alice in Wonderland.

In *Why Do Things Get In A Muddle? (Come On Petunia)* things appear to become more and more confusing. The actors in the scene move about and, above all, they speak backwards. At the same time, the video recording itself runs backwards so that everything should be in order. However, in actuality the viewer has to make an effort to understand the strained dialog, because as the language goes back and forth the phonetic structure is displaced. Also, a pipe – besides in films – cannot be really be smoked backwards. A moment that is as irritating as a wooden arrow that flies into the father's hand. However, it is these irritations that allow the viewer to realize what "went awry"...

Why Do Things Get In A Muddle? (Come On Petunia) explores the possibilities, limits and effects on order and disorder in a philosophical manner as well as with regard to the media of video, film, and speech. While, as the father reasons, there are many ways to bring disorder to things, the margins for order are extremely limited: For example, there is only one 'Come on Petunia.' Whereupon Alice answer, "But Daddy, the same letters might spell 'Once upon a time'."

When I visited the Museum of Jurassic Technology in Los Angeles earlier this year I was confronted by a poster in a glass frame. I could see my own reflection in the glass so that my face was transposed onto the poster itself. On the poster were the words "*The learner must be led always from familiar objects towards the unfamiliar.... guided along as it were, a string of flowers into the mysteries of life.*"

That is what I think synaesthesia is. It is like a string of flowers that each whisper mutinous suggestions. For those who listen it can cause different tensions between things. It can cause ideas, inventions and discoveries to resurface, relocated and reshaped in the guise of another time, another place, another person.

PART 4

MIND, THE GAP
ARTISTIC RESULTS

The result of the research project *Mind, the gap*, is a compilation of various investigated aspects of my research about synesthesia presented in an artistic form. This resulting work crosses between the performative to the visual field, from the site-specific to the concert hall, the black box and white cube.

The Emotion Organ

12 year old Jonas Brein Selvig playing The Emotion Organ

Short description

The Emotion Organ is a synaesthetic simulacrum machine, an instrument where players can explore the space of its performative possibilities in an open-ended fashion. The affects and effects are unpredictable, emergent and moody. The Emotion Organ brings the internal emotional journey of the player into the material world in its own special way. Without electricity it can be played as a conventional musical instrument. When plugged in it can become different things - from a modified musical instrument, to a quiet, aromatic gaming machine, or simply a foot-operated fan. Its affects can range from flying a vintage plane into the sunset to strolling through a garden of vibrant, aromatic flowers. It is the perceptions of the toucher that are at stake – to discover through touch the sensational interplay of hearing, seeing, smelling and motion.

Inspiration

The Emotion Organ was initially inspired by a combination of a clapped out pump organ from

1895 standing in my studio and a simulacrum contraption that features in the novel *We can build you* (1977) by the renowned sci-fi author, Philip K. Dick. The Mood Organ, as it is called, is a devise for home-use for venting strong emotions undesirable in a futuristic dictatorial society, and marketed as an alternative to addictive medication. Ironically, people became addicted to playing the Mood Organ, hacking it to achieve more intense emotions.

Once I had decided to invent and build my own Emotion Organ I was inspired by the story of Louis-Bertrand Castel, his attempts to build an ocular harpsichord in 1725, and the evocations and ideas he experienced as a result. In his diary he wrote: "Not in dreams, but especially in the state of dizziness preceding sleep, or after listening to music for hours, do I feel the correspondence between colors, sounds and scents. It seems as if they all rise mysteriously from the same ray of light and, subsequently, reunify in an amazing concert. The scent of deep red carnations above all has a magical effect on me."

Later I saw a documentary program about the life and work of virtuoso organist Dame Gillian Weir in which she described good music as "a jewel hanging in the air. A many faceted jewel out of which springs light. It is marinated through the performance context and merges with the performer". She asked a student; "If you met this (music) on the street, who would it be: A man or a woman?" To which the student replied, "a peacock". "Then show me the peacock!", said Wier. "Do not think of different notes, but rather the shapes you make .... Make the organ sing and listen to the weight of the note as you release it." [123] Finally she said that we don't know our music until we see the instrument to which it was given birth.

123 These quotes are taken from scribbling down the dialogue of the program in my notebook, so they may vary from the actual conversation. The program was first made in 2000 for Melvin Bragg's Southbank series on ITV. I saw it on NRK2 in September 2004.

Visualisation

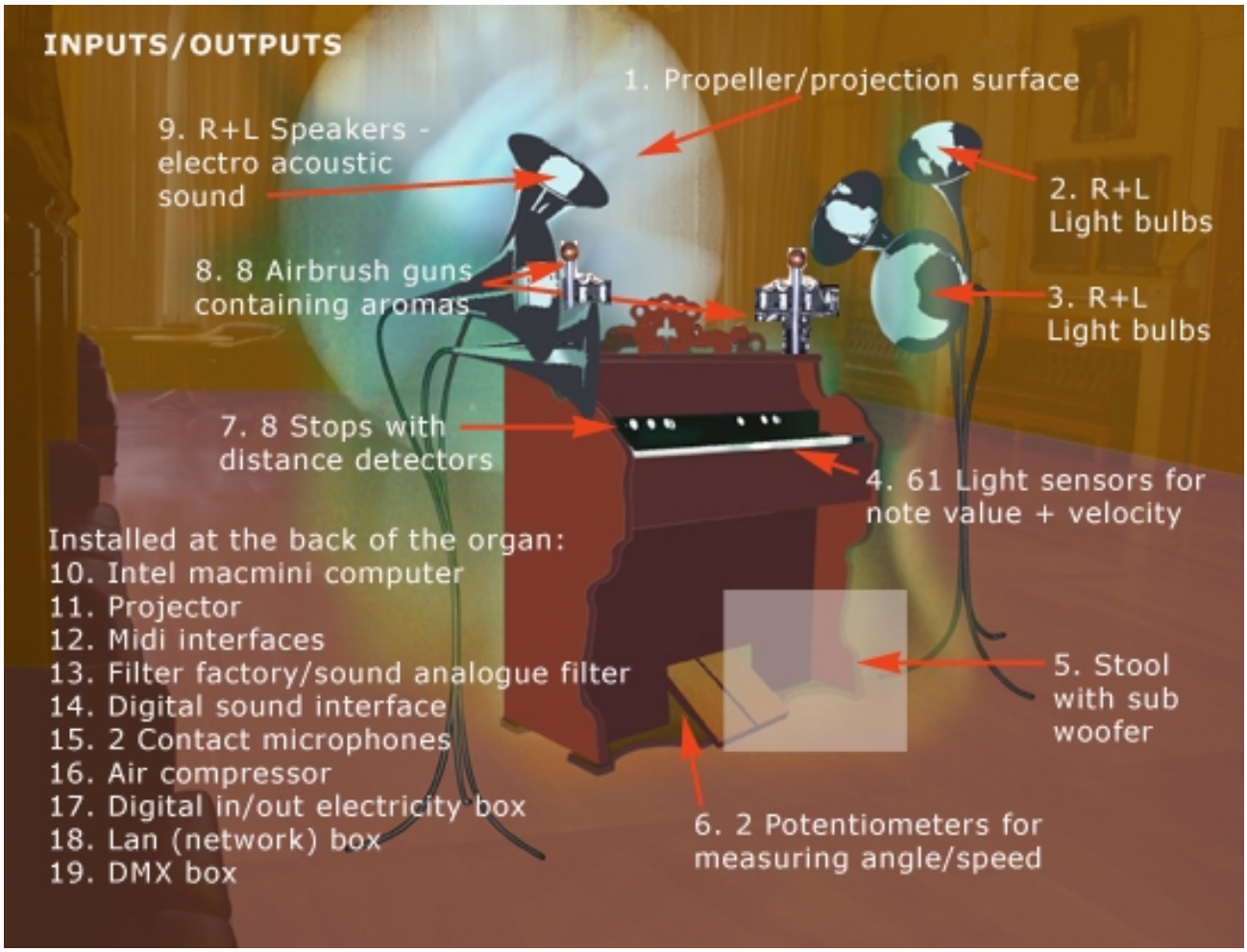
I too had to see my organ before I knew exactly how it should produce a synaesthesia of aroma, sound, light, colour, motion and vibration. Below are two images that attempt to visualize what I had in mind at two different stages of my project. The image on the left was made in December 2004 for my project application. The image on the right was made in February 2006 after over a year of research and experimentation.[124]

Practical work

Practically speaking, I set up a worklab where I took apart and restored the organ. I re-engineered it using a combination of past and present technologies for audio/visual production (analogue and digital hard- and software) as well as custom-made sensors and devices. As I encountered issues that I could not overcome myself, I sought help. These include aspects of physical computing (sensor building and programming), restoration and physical modification of the organ, visualising the organ's modified appearance, devising a way to emit aromas, controlling the electro acoustic sound of the organ, and finding a source of meaningful data to apply to the programming of inputs and outputs. On the next page is a diagram and explanation of the physical inputs and outputs of the Emotion Organ.

124 Here the Emotion Organ is envisaged in the Eidsvold Gallery in the Norwegian parliament building. It was sent as a visual aid to accompany an application in which I proposed installing the organ to give politicians a chance to explore their changing colour of politics in an abstract and sensuous way that could possibly inspire them to make better decisions about the shaping of our society. My application was turned down, but I will try again later.

Everything is connected



1. The propeller *(flight, wind, storm, dervish, freedom)*[125]

The propeller stands approximately 4 metres away from organ. It acts as a projection surface for the varying coloured light that shines out from the projector installed at the back of the organ. The image hangs in the air. The speed of the propeller is controlled by the footpumps (6) which have potentiometers installed beneath them. The faster you pedal, the faster the propeller spins. There are eight modes for speed based on the data derived from pulling out the 8 organ stops (7). This is described below in point 7.

2. The small phonograph horns *(eyelids, stars, morse code)*

Inside the small 2 phonograph horns on each of the metal stems are light bulbs. They flash on and off with varying degrees of brightness according to how hard the organ keys are depressed (velocity). This is controlled by the 61 light sensors installed under each key of the keyboard (4). The phonograph horns are mounted on flexible goose-neck tubes so that they can be adjusted according

125 The words in brackets are associative descriptors that have evolved during the construction of The Emotion Organ, rather than being prerequisites for design.

to the whim of the player, who can turn them inwards to feel the effect of the light, or outwards for others to see.

3. The large phonograph horns *(blooms of light, headlamps, sun, heat)*
Similarly, the large horns have light bulbs inside them. They react to the sound envelope (volume) that is picked up by 2 contact microphones installed in the organ, and produce softer ambulations of light.

4. The keyboard *(fingers/digits as lips, colours as words, eyes as hammers)*
The light sensors under the 5-octave (plus one key) keyboard have various functions. They detect which note is being played. Different combinations of keys are responsible for changing the colour of the projected light circle. The velocity value also controls the brightness of the projected colours. The right most key/sensor switches between 2 modes of the electro-acoustics of the analogue sound filter installed in the back of the organ. It manipulates the original organ sound. The frequency of the manipulated sound slides from high to low depending on how many keys are depressed. One unmarked (hidden) key reverses the audio/visual output. For a novice player it can be a novel surprise. For an experienced player it can be used as an expressive gesture.

5. Stool *(arousement, depth)*
The sub-woofer is installed inside the organ stool. It emits low frequency sounds generated by the electro-acoustic sound filter (13). At certain levels it is possible to feel the strong vibrations caused by low sound frequencies.

6. The footpumps *(lungs, power, speed, grounded, walking, running)*
The air from the footpumps creates a vacuum in the organ bellows, affecting the volume of its various audio output modes. However, by varying pedaling speed, and hence the speed of the propeller, the projected coloured light becomes split up, creating optical illusions and multi-coloured variations of the whole and fragmented circle.

7. The eight stops *(glotal stop, navigation, mirror, lens)*
The 8 stops of the organ are mechanical levers, and have distance detecting sensors to register when they are activated and how far they are pulled out within a 4 cm range. As they are light-sensitive they are relative, rather than fixed detectors. The four left hand stops affect the lower bass keys, and the right hand stops the higher keys (treble). Like our hands, their functions are mirrored. The two outer-most levers are 'couplers'. They do not change the sound of the organ itself, but are connected to notes an octave below or above the key played. The remaining 6 stops change the quality of the

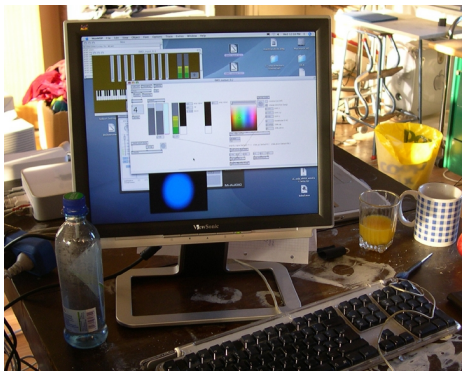
sound by controlling how much air is passed over the 122 reeds (2 reeds for each key) of the organ. The effects range from solo 'voice', and 'nasal', heavenly and flute-like qualities. The 4 stops in the high range control video filters that affect the coloured, projected circle, creating different shapes and patterns of light. Each time a stop is pulled out it changes the rotation direction of the circle. The stops also affect the speed of the fan, and the effort of pumping the footpumps. With 1 stop out it is difficult to gain speed (like walking up a steep hill), with all 8 stops out it is easy (like running down a steep mountain).

8. The eight airbrush guns *(pollution, intoxication, presence, memory, trigger)*
The 8 airbrush guns (usually used for graffiti) are fed by the air compressor. They have push-type solenoids attached to their valves, controlled by the i/o box, Lan box and DMX box. Each aroma corresponds to a colour of eight sound groups. They are activated on a programmed timer that registers how long a player sustains a certain group. The aromas are stored in their cups. Each one is a synthesized aroma composition. They range from sweet to acidic, bitter, floral and synthetic-like smells. As each aroma is released it fuses with the previous ones. The propeller performs a social function, spreading the aromas to an eventual audience and clearing the air for the player. The player has the best chance to experience individual aromas, while the audience experiences the combined aromas. It is easier to recognise the descriptor names of some aromas, and impossible to recognise others. The perception and effect of aromas is highly individual.

9. The medium-sized phonograph horns *(synthesis, industrial aura, transmission)*
The medium horns have small speakers installed inside of them. They are fed by the electro acoustic analogue sound filter via sound picked up by two contact microphones that pass through the digital sound interface. They modify the sound of the organ's own voice in different ways. Certain frequencies cause the aluminum horns to vibrate and resonate. When the horns are placed close to the ears of the player the stereo sound becomes localised, or they can be directed out into the space. Eventual audience members can stand with their ear close to the horns.

10. Computer *(brain, fuzzy logic, memory, alchemy)*
The computer is the digital brain of the organ's nervous system. It receives and digitizes signals, stores data, connects and modifies electrical signals from the sensors (connected to the MIDI interfaces) and sends them out to the various organs of the machine via the Lan box, the DMX box and projector. The programming platform is MAX-msp with Jitter as the visual engine, and the main protocol for signals entering and leaving the computer is MIDI. The graphical interface of the control 'patches' (the name given to the digital 'space' where mappings are made) resembles the

organ's physical parts. Apart from lists of control data, the only media stored in the computer are two images: a white circle on a black background, and an image mask of the same shape. All other media are generative/emergent. The programming principle for creating groups of sounds is based on Alan Forte's system for structuring atonal music. 6 main and 2 sub sets of chromatic sound groups correspond to colours in a chromatic scale from red to violet and white. Each group has a corresponding aroma. Three different keys in the 12 tone scale must be depressed to get a result, and the system works independently of octaves. One-finger-play results in no colour and no aroma. This system can register a player's tonality preference. In addition, an article about the listener's emotional engagement with works by Scriabin and how these are affected by the pianist's bodily enactment of performing these works is applied. Velocity, volume, shifts in musical phrases, speeds and tonalities are described as a way of gaging a player's emotional response.



11. Projector *(aura, hallucination)*

The projector is installed inside the organ and is the source of coloured light. The (hidden) imagery on the computer differs from the effect of the coloured light as it rotates on the propeller. Varying speeds of the propeller cause various visual illusions/retinal manifestations of coloured light forms. I have not yet been able to capture these successfully, either with still camera, or video camera. At times the coloured light seems to rotate in the opposite direction to its actual rotation direction.

15. Contact microphones *(skin, surveillance, slide, glitch)*

There are 2 contact microphones installed inside the organ. They pick up the sound of its mechanical parts in action as well as its own voice and create feedback. The sound they pick up passes into the digital sound interface, then into the analogue sound filter where it is modified into retro-synth-like sounds. It is then sent to the subwoofer, and finally into the speakers in the phonograph horns. The sound frequency and tempo is modulated according to how many fingers are in action on the keyboard. One finger produces low frequencies, 10 fingers, high. The sound slides up and down between these frequencies. The sound volume (or rather, envelope) also controls the dimensions of the projected circle.

Playing the organ

In order to explore The Emotion Organ's synaesthetic potential a player must experiment with the way in which various combinations of its 61 keys, 2 foot pumps and 8 stops can produce different results. Its appearance is deceiving. It is no longer a pump organ but a unique and highly personalised machine for individual indulgence. Maximum effect is not analogous to hard pumping and loud volume. Sensitive conversations with The Emotion Organ result in richer textures and combinations of sound, light, aroma, vibration and movement. There are two rules for playing The Emotion Organ. The first is that it should be treated with respect as it is a fragile and nervous instrument. The second is that it should be played bare footed for maximum contact.

Once the initial work was completed, I held open studio sessions where The Emotion Organ was put to the test by people of various ages and competences. They were given no, or little information as to how it worked before hand. Testers ranged from approximately 12 years to 60 years of age, and were both musicians and non-musicians. Amongst them was the notorious performance artist and organist Charlemagne Palestine, who described it as a 'fucka-rucka' machine.

Charlemagne Palestine playing the Emotion Organ, November 2006

As a result of these open sessions adjustments and repairs were made. I also assessed how best to introduce new players to the machine in the future. While most testers displayed extreme concentration and immersion when playing The Emotion Organ, the organist and the young boy displayed the largest degree of extrovert playfulness in terms of body movement and vocal expression. All seemed to enjoy observing others attempting to play it. They said that they had never played an instrument like it, and expressed a wish to spend more time with it - preferably alone.

The question of whether The Emotion Organ can create an experience comparable to true synaesthesia is, as yet, an open-ended one. It is such a context-sensitive and subjective issue that even a Syn, who has her own synaesthetic repertoire may not experience synaesthesia through contact with the machine. The most conclusive response I received was from the New Music composer Bjarne Kvinnsland. He sent me an sms a couple of hours after visiting my studio to say that The Emotion Organ had evoked emotions in him that he had never before experienced with music.

In January 2007 The Emotion Organ will be introduced to a wider public at the Norwegian Theatre Academy, staged as a two-day live art event in a salong-like setting. First, an invited organist will perform a prepared improvisation, followed by my own short improvisation. Then I will give a brief presentation of The Emotion Organ to the public and open up for the possibility for them to try it themselves.

Collaborative works

I have tested principles and techniques generated from the process of constructing The Emotion Organ - from prototyping parts to working with various artistic strategies and sensory experiments - by participating in collaborative live artworks in diverse contexts that do not involve its physical presence. As such, it has already succeeded as an artistic device for generating new approaches, concepts and aesthetic potentials. These works are described and reflected upon below, starting with the latest event and ending with the earliest.

In Death Valley, everywhere we looked, gently waving stands of desert gold blossoms danced in the wind, their daisy-like faces punctuated with vibrant orange centers.

Motherboard, May 2006

Developed for Galleri F15's 40 year jubilee exhibition, *Prosjektrommet 93-06*. Moss Bryggeri Utstillingshallen, Norway.

Motherboard: Per Platou and Amanda Steggell.

Sound: Geir Jenssen/Biosphere.

Flower construction: Aslak Nygren.

Short description

This work is an installation that draws on the notion of synaesthesia to create an emotive,

intersensory experience where undulating combinations of sound, colour, light and aroma are brought together in a kinetic sculpture – or a sensorium-like sculptural space. The aim was to create a contemplative, awry, timeless atmosphere that affected the public directly. A sensuous experience that could lead to quiet thought.

The centrepiece is a rotating, metalic 'sound flower.' Panoramic visions of Death Valley are projected onto a rotating disco ball covered with pieces of broken mirrors. It fragments the video footage into different shapes, and beams them around a white room (cube). Its floor is covered with salt. The brightness of coloured lamps undulates in response to the sounds of the metallic flower, causing shifting shadows to appear. A strange aroma fills the space.

Background

In Death Valley .... was developed for a large exhibition to celebrate the 40th anniversary of Galleri F15 in Moss, Norway. It featured contributed works of 99 artists, each who had exhibited in the gallery's project room in the period between 1993-2006.

With this in mind, the installation aimed to appeal to visitors of all ages and walks of life, and demanded no more from them than their presence. The idea was that the installation should act as a special atmospheric zone in the midst of an eclectic exhibition and that the public should have the feeling of discovering it for themselves.

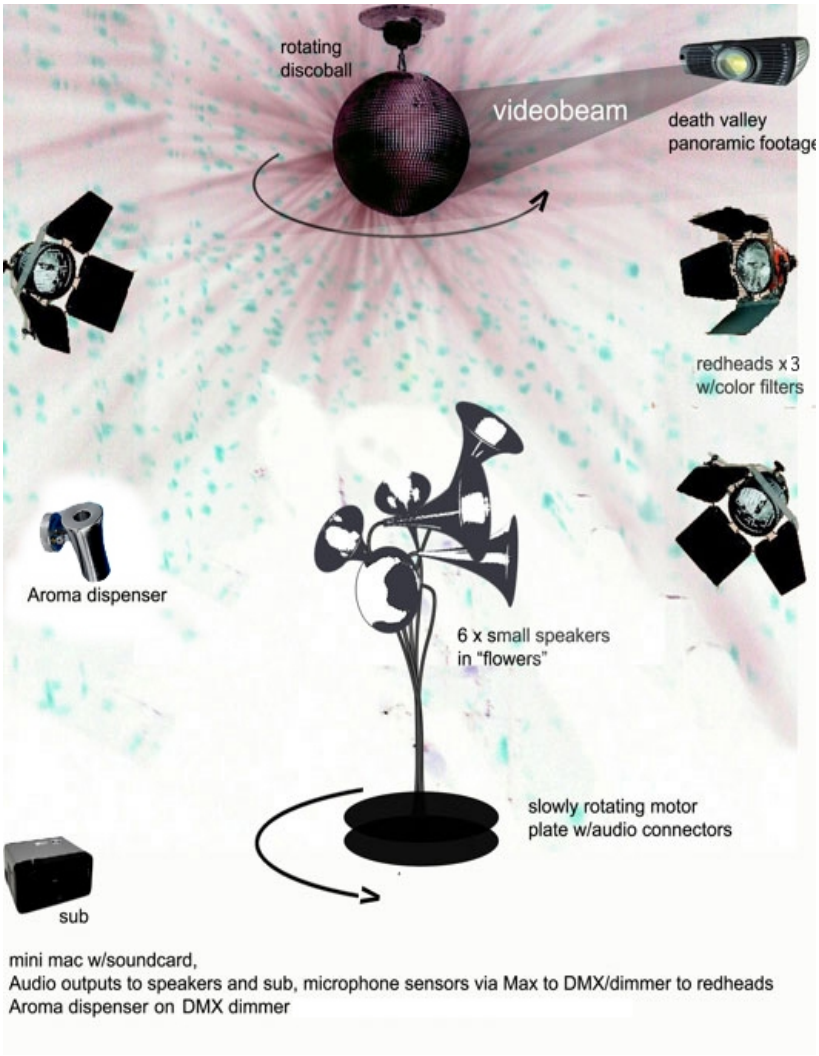
The inspiration for this project came primarily from an emotive response to the bloom-like shape of the phonograph horns that are used in The Emotion Organ. So organic, yet metallic they seemed to suggest a certain resilience – like flowers that struggle to survive in a harsh climate. Then, first hand experience of both the blooming in Death Valley, and the vast expanses and debris of other North American deserts provided more fuel.

Construction and materials

The diagram on the next page shows the technical set up for *In Death Valley...* I used MAX-msp to create fluctuating cyclic states of the combined media outputs. The 'sound flower' and the mirror ball rotated in opposite directions, and with a slight inconsistency in speed to make it seem as if the one was affecting the other. While synchronization gives a feeling of automation, slight deviations in speed can give a more organic feeling, like the kinetic relationship between planets and stars, flowers and the sun, the tide and the moon. The audio-scape was based on recordings of desert sounds combined with a composition by Geir Jenssen, made up of his own samples of Buddhist monks playing Tibetan bells. The higher frequencies were dispersed through the individual phonograph

horns of the sound flower, while low frequencies came from a sub woofer to give a sense of depth perspective to the sonic picture.

The aroma oil was chosen for its awry, bitter-sweet quality. It is the synthesized smell of an Egyptian mummy, created by the English aroma designer Frank Knight, in collaboration with anthropologists. The intensity of the aroma changed as the temperature rose and fell. The visual imagery consisted of rotating fragments of video, hues and intensities of shifting light and shadows. Five tons of sea salt on the floor created a crunchy, textural and tactile surface, where visitors' footprints could be seen after they had left the space.



Response

If the success of an artwork is to be judged by the reception it receives by the public and critics, then *In Death Valley ....* was a definite success:

"There are moments when being an art critic feels like a burden, and the act of describing and expressing opinions feels almost perverse in that it is hard to do so without violating the actual experience. Per Platou and Amanda Steggell have created a work that I am so intensely in love with that I am actually a bit embarrassed to talk about it. It is as though

the work is custom-made for my private feelings and longings, however I can't put my finger on exactly what or how. At the same time, it seems to be the exhibition's most universally accessible work - because it is so instantaneously sensuous. Particularly the use of aroma is so effective that several hours later I could still sense it on me as an aftertouch of a lover's caress. To experience the work feels like being wrapped in swaddling clothes and laid in a cradle, and the memory of the experience is almost stronger then the experience itself. The installation has become a friend and it is the only artwork that I have ever attempted to hug. It feels sad to have to have to say goodbye, but friends come and go. The parting is endurable because there is hope that we may meet again and everything that has happened in the meantime will generate new things to talk about. It is through moments like these that the art circus proves itself worthwhile after all." [126]

IKON

Motherboard, December 2005

Created and performed by: Hauk Heyerdahl, Runar Hodne, Annesofie Norn, Per Platou & Amanda Steggell.

Original text: John Erik Riley

Performances: 2-4 & 8-11 December 2005

Venue: Grusomhetens Teater Scene, Oslo

Brief Plot Synopsis

A wanna-be documentarist weaves himself into the making of his own documentary film - a masterpiece through which he dreams of achieving acceptance, notoriety and iconic status. His film is about the rape and murder of a young boy - a crime which he may have committed himself. He has constructed a DIY film studio for the purpose in which he is joined by the unseen interview subject who may be the victim of the crime, an eye witness or an illusionary figure in the delusional mind of the documentarist himself.

Collaboration

Through this work we experimented with theatrical form of the monologue by placing classical dramatical dilemmas within a contemporary live art practice where things don't happen in a fixed sequence, but are jammed together by the performers. Influenced by Antonin Artaud's *Theatre of Cruelty*, we aimed at creating a space that spoke a material language which would directly affect the bodies of the spectators, and, hence closed the gap between them and the stage. On the stage everything was connected. Sound affected light. Closed circuit TV produced feedbacks of colour

126 Quote from Erlend Hammer's review in Norwegian Art Magazine *Billedkunst*, 04/06.

and abstract form. Aromas were sprayed directly over the public in connection with actions and words. Live radio was mixed into the soundscape and fused the spectacle of the world outside with the on-stage drama. It produced unpredictable juxtapositions with the text, shifting the context and making each consequent performance very different from the last.

In short, a synaesthetic strategy was used as an evocative device to disrupt the the divisions between both the senses and the media that speak to them. As performers our job was to improvise with our designated tools to make varying textures of sound, colour, light, aroma, text, movement and gesture on which the text performed by the actor must try to stay afloat.

In addition to testing methods of using sound to control lights, participating in this work gave me the opportunity to test both the practical implications and expressive potential of using aromas in a public setting.

I selected four synthetic aromas for this hour-long performance. The first was the smell of instant coffee with milk and sugar, relatively pleasant yet hard to pin down. The second was bitter mint, and easily identifiable. The last two aromas, burnt bacon and the smell of horses and stables, were experienced as very unpleasant by many, and identified by few.

During one performance a woman jumped out of her seat and exclaimed "horses!" as the last smell was emitted. She told me afterwards that she was an avid rider as a child, and for her the smell evoked pleasant memories. Another, with an allergy for horses, got a mild asthma attack, and, as I share his allergy, I am pretty sure it was a psychosomatic response. While the public were more than willing to discuss their responses to the aromas with me after the show, so were the critics in their reviews.

Writing for the weekly newspaper "Morgenbladet" Jon Refsdal Moe said:
"It stinks of mouldy stables and burnt bacon in Grusomhetens Teater; actor Hauk Heyerdahl is our man on the sofa. A very worn out man, dressed in a pair of even more worn out slippers embarks on his conversation with an absent partner. If we are to beleive the author Riley, it all revolves around a sexually traumatised young man with the name John Erik. What makes it more detestable is that I also know that it it is about me.

The man calls himself a documentarist, but the theatre looks and smells like a shaby porno studio in a frozen, desolate place far from here, where only the pornographist himself remains after the youth have long since learned to keep well away. This man has locked me in with him and thrown away the key. Now him and I shall interact. Help me out of here!

Rather than being an artistic attack on a superficial media society (blah!), Ikon is primarily an attack on artistic strategies. Transgression is nurtured today in the institutional counter culture, but where it once dealt with establishing utopias beyond logic, we now talk about aesthetic invasions: of the field of media as well as the observer's totally private room. IKON is the story about a project where these invasions merge, formulated via an art practice which is strikingly similar. This makes Ikon one of the most interesting comments on contemporary times that I have witnessed for a long while. A Salò for hipster-aesthetics in 2006? At any rate it is the best Pasolini performance you will see this year."[127]

Imagining St. Mary Magdalene

Produced by FUNK.CO.UK, July 2005

Location: St Mary Magdalene's Church and Gardens, Islington, London.

Background

In July 2005 Dean Whitbread of FUNK.CO.UK invited Motherboard to take part in a collaborative site specific event called *Imagining*. Participants ranged from artists, architects, musicians, archaeologists, local historians and ecologists to Church groups, local residents and park users. The event took place in the space of seven days in St Mary Magdalene's Church and Gardens, situated just off Holloway Road in Islington, and culminated with a special live art event.

While *Imagining* aimed to explore and express the many aspects of the church and gardens over a period of a week, one of the aims was to attempt to make the presence of the church's Asylum group more visible to the local community. As this event took place directly after the London bombing incident, a certain poignancy surrounded the whole event, and the asylum seekers were reluctant to make their presence visible, as was originally planned.

My contribution

For my contribution I wished to make something ethereal, that responded to influences from the real world. I also wanted to make something that would appeal to the children of the Asylum group who often played in the church. I imagined transforming one of the plain church windows into a 'living' stained glass fresco. Here Mary would recline in a beautiful garden, with cherubs and children and flowers that danced to the sounds of the church - organ music, children chattering, ping pong games, language classes, cooking, srevices, councilor sessions and church bells. This vision would shine out into the night for all to see, and reflect the shifting rhythms of the very body of the church itself.

127 *En Pasolini Verdig*, Jon Refsdal Moe, Morgenbladet, 09.12.05

To realise this idea I made a video collage with seven individually manipulatable layers, based on Henri Rousseau's painting called *The Dream* (1910). I pulled out portions of a digitized version of the painting to apply the layering technique Rousseau used in his paintings to my video. Using the KeyWorx software I made a system where each layer of the imagery could be manipulated via sounds picked up by a microphone from within the church. For the special benefit of the children I added flying pigs, and abstract 'flowers' that changed hue and shape with the sound, as well as two dark-skinned cherubs that were placed in the foremost part of the image.

To make the projection visible both inside and outside the church I painted the window with yoghurt.[128] As I worked on the church window in the dark hours, my process was projected out into the church and surrounding area. As I left, each new version was left running throughout the night.

On the final performance night the remaining windows were lit up with red and green lights. A sound installation by Per Platou (based on interviews with the asylum seekers who spoke and sang in their mother tongues), *Elegy for St. Mary Magdalene,* was played both inside the church accompanied by organ and piano improvisations, and distributed around the church gardens via walkie-talkies. The Asylum group, who had been present all week, did not turn up to this evening, and their request to remain anonymous was respected when documenting the event.

From the perspective of artistic process, my research into synaesthesia and visual music played an important role in how I approached this assignment. I have no documented oral responses to this

128 Each morning I found several church mice licking the yoghurt off of the window!

work, save that of the initiator of the event (whose comments may be somewhat biased). However, the church users took pleasure in demonstrating to others how sounds could create movement and colour. Working late into the night I observed how passers-by (on foot, in cars and on bikes) stopped up in their tracks to watch the window from the streets beyond.

Eraser's Edge

Ultima Festival 2005

The Norwegian Academy of Music, Lindemansalen, 12 October 2005

Composer: Ole Henrik Moe

Choreographer: Amanda Steggell

Violin: Sigyn Fossnes

Piano: Einar Henning Smebye

Rubber: Einar Fjærvoll

Short description

Eraser's Edge is a 17 minute composition for violin, piano, a rubber, live video and a human metronome. A pianist plays a relentless rhythmic repetition of 3 notes at varying velocities, while another users a rubber to slide up and down on the piano strings, manipulating the tones struck by the pianist. A violinist cuts into the soundscape like a razor's edge, while a choreographer captures the actions of the performers and fuses them with computer generated abstract imagery. A human metronome keeps the beat going.

Background

I commissioned this piece as music for a choreography in collaboration with the Norwegian composer Ole Henrik Moe in 1995. It was never realised at that time, partially due to the fact that it is almost impossible to play. Finally, ten years later, a group of musicians were found who were willing to take on the challenge. One of the original inspirations we had for this piece was the synaesthetic aspects of *Un Chien Andalou*, Louis Bunuel, 1928. The opening sequence of this film was a central theme in the way I approached my work in *Eraser's Edge*.

My role in the performance

For this work I designed the stage set-up and performed a visual choreography. I restricted myself to performing under similar conditions to the musicians by performing from one spot, sitting on a stool in the "apron" of the piano. I could only film as far as I could stretch from this position. Using KeyWorx as my software platform I connected the video image to the music to create a jittery, morphing concrete and abstract visual expression.

The 8th Sister. (An exercise into the depths of Freudian perception)

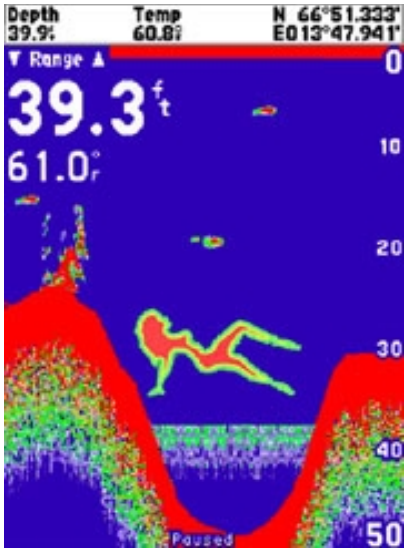
Motherboard, July 05

Per Platou and Amanda Steggell, with Annesofie Norn, Neptune Sports Diving Club and the people of Husøy, Træna.

Location: On the arctic circle in the archipelago of Træna, Nordland, Norway.

Short description

The 8th Sister is an art project that investigates the practical and contextual implications of creating an underwater sculpture in which her "true" form – a naked woman - is manifested as an infinitely changing image on an echosounder display.



"Depth has become profound even as it has become increasingly superficial. The idea that the deep harbours the truth is an old one; surfaces have prevaricated since the Greeks, appearances deceive, and it is foolhardy to trust the eyes." [129]

Most people today are familiar with 3D, and comprehend 3D as manipulatable representations in a two-dimensional form (on a screen) in computer games, as well as animations on TV and in films. *The 8th Sister* poses questions about the general acceptance of this type of reality rendering in that the synaesthetic process transforms depth to surface - from 3D to a flat 2D.

Background

This project was inspired by a visit to the small fishing community of Træna, located on the arctic circle, 50 km off the mainland of Norway. Here the 450 or so inhabitants use boats to get around, and echosounders to navigate through the 1000 small islands that make up the municipality.

While sheltering from the rain in an echosounder shop on the long way home to Oslo a speculative idea emerged – what if a fisherman discovered a naked woman at the bottom of the ocean while searching for shoals of fish? In relation to my project, the idea was appealing in that soundwaves would be responsible for revealing her presence, transforming her physical body into a two-dimensional image. And then came the question; would it be possible to create an underwater sculpture that would appear on a an echosounder display in the form of a naked woman? If so, what

129 Judith Roof: *Depth Technologies*, p21 in *Technospaces - inside the new media* by Sally R. Munt (ed.), Continuum 2001. ISBN 0-8264-5003-2.

should she be constructed of, what dimensions should she have, and how far down would she have to be sunk to be rendered correctly on the surface?

As the idea ripened, speculations of who this woman could be resulted in anchoring her identity within a local context, namely the legend of The Seven Sisters mountain range that can be seen on the mainland from Træna when weather permits. According to one of several versions of this story, the seven sisters were skinny-dipping in the sea with the beautiful Lekamøya, when they were spotted and chased by the horny Horseman. The seven sisters threw themselves to the ground while Lekamøya tried to escape. And then everything mystically turned to stone. Exactly what happened to Lekamøya after she fled is a subject of debate.

It was from these speculations that the project, *The 8th Sister* was born. Her target audience was seafarers, fishers, local inhabitants and tourists. She was sunk 10-15m under the sea in Træna, strategically placed in the path of an extensively used boat route in visual proximity of The Seven Sisters.

Material and construction

After extensive material research, she was eventually constructed of I5000m of metallic ribbon cut into 5000 lengths of between 2 to 5m, each tied to 5000 one-kroner coins that acted as weights. These were placed on the sea bed by local divers according to a simple sketch where the different lengths of silver ribbon would create the contours of a female form.

Video stills from the documentary video about the project.

The 8th Sister was completed during 36 hours. Her life expectancy in physical terms was predicted as being somewhere between 6-12 months, depending both on the erosiveness of the underwater world and eventual changes in coastal environmental regulations. Her afterlife in terms of local

mythology/memory is unknown. However, a commemorative plaque in the form of a gravestone was placed at her feet for serendipitous discovery by future divers.

Upon seeing the gravestone for the first time one of the divers proclaimed; *"A gravestone! The 8th Sister - that's Lekamoya! Do you realize that what you're doing is twisting history? I'll willingly sink The 8th Sister to the bottom of the sea, but I want a guarantee in case I get sued afterwards, because this is blasphemy in relation to the history of Helgeland."*

A fisherwoman's response was different. Though she saw The 8th Sister from her boat without the knowledge of the gravestone she said: *"I don't associate her with the Seven Sisters mountain range. I think it's quite natural, because what people talk about, it's always how many men have drowned at sea. But there are many women too who have lost their lives. So at least we know where she is now. We don't know where all the others are. They're gone forever. So she can be a monument for all the women who've drowned at sea."*

From concept to context

The strategy of anchoring a conceptual project within the context of a local legend proved to be an evocative device. National TV coverage and local newspaper reports prior to the event meant that when we arrived in Træna everybody knew who we were and what we were attempting to do – but not how we were going to do it. They were, however, more than keen to help out, both in constructing *The 8th Sister*, and spreading the rumour of her to others. Despite the fact that a large music festival was taking place at the same time, it was only the local people who took an interest in The 8th Sister.

The original idea was that the rendering of the physical object would create a 'virtual' figurative object (almost present, like an hallucination) on an echosounder display, and that the physical sculpture would deviate considerably from its virtual form, taking on abstract proportions. In reality, both the virtual and physical objects became abstract. As the tide flowed in and out it rocked the tentacles of *The 8th Sister*, causing her image to render differently. Passing over her at different speeds and angles, as well as the use of different echosounder models and settings also produced diverse renderings – like a virtual form of underwater graffiti.

Upon seeing *The 8th Sister*, an electrician commented that *"from a technical point of view, if you sail over her lengthwise, you see the whole of her. But if you sail over her the other way .... (a man cuts in and comments;* you only see her breasts!*) No. You can't see anything, but it is possible to get a reflection."*

From another perspective, the fisherwoman commented on her experience of *The 8th Sister* like this:

"The first time we sailed over her with the echo sounder, she looked like an angel. And the second time I think she looked more like a mermaid. And when we looked down at her visually all we could see was something glittering…"

From the various reports it became obvious that the power of imagination filled in the gaps that the abstraction left out. *The 8th Sister* was speaking to people in different ways – just like her seven mountainous sisters.

As the first of a series of attempts to use synaesthesia as a strategy for creating live art *The 8th Sister* showed that whatever theories artists may have, it is not until the work is unleashed on the public that it is possible to judge whether these strategies have been effective, or in fact relevant at all, except in an art-historical context. In live art, theory becomes an hypothesis that is put to the test in the moment it is presented, with no safety net to fall into.

Selected bibliography:

Abendroth, M., Decock, J., Heremans, P., Plennevaux, A. *The shape of sound*, published in l'ARCA, no. 181, http://www.lab-au.com/files/doc/arca2-eng.htm#1, April 2003

Artaud, A. *Selected Writings* (1927) (ed.Susan Sontag), University of California Press. ISBN 0520064437.

Branden, W. J. *Engineering marvel: on Billy Kluver*, published in Artforum, March 2004

Bowers, F. *Scriabin again and again*, published on ubuweb: http://www.ubu.com/aspen/aspen2/scriabin.html

Brougher, K. Strick, J. Wiseman, A. & Zilczer, Z. (org) *Visual Music, Synaesthesia in Art and Music Since 1900*, published on the occasion of the exhibition Visual Music, The museum of Contemporary Art, Los Angeles, published by Thames and Hudson, 2005 ISBN 100500512175

Cubitt, S. *Anxious Loves* (A revised version of a talk given at The Digital Equinox Conference, Birmingham, England), published on nettime: http://www.nettime.org/Lists-Archives/nettime-l-9803/msg00045.html, 1997

Cytowic, R. *Synesthesia: Phenomenology And Neuropsychology*, A Review of Current Knowledge, published in PSYCHE, 2(10), July 1995, http://psyche.cs.monash.edu.au/v2/psyche-2-10-cytowic.html

Cytowic, R. *The man who tasted shapes*. Published by The MIT Press, 1998, ISBN 0262532557.

Dekker, A. *Synaesthetic Performance In The Club Scene*, for Cosign Conference, Netherlands Media Art Institute, Montevideo/Time Based Arts Amsterdam, http://www.cosignconference.org/cosign2003/papers/Dekker.pdf, 2003

Dick, P. K. *We Can Build You*, 1972, published by Vintage; Reprint edition (May 31, 1994) ISBN 067975296X

Franssen, M. *The ocular harpsichord of Louis-Bertrand Castel: The science and aesthetics of an eighteenth-centure cause celebre*. Tractrix Yearbook for the History of Science, Medicine, Technology and Mathematics, http://www.tbm.tudelft.nl/webstaf/maartenf/, 1991

Furlong, L. *Notes Toward a History of Image-Processed Video: Steina and Woody Vasulka*, published in Afterimage, Vol. 11, No. 5, 1983

Heyrman, H. *Art and Synesthesia: in search of the synesthetic experience.* http://www.doctorhugo.org/synaesthesia/art/index.html, 2005

Higgins, D. (1966) *Statement on Intermedia*, published in: Wolf Vostell (ed.): Dé-coll/age (décollage) 6, Typos Verlag, Frankfurt - Something Else Press, New York, http://www.artpool.hu/Fluxus/Higgins/intermedia2.html, 1967.

Hill, C. *Interview with Woody Vasulka*, c. 1996 Hill/Vasulka: http://www.vasulka.org/archive/Contributors/ChrisHill/InterviewWoodyVasulka.pdf) May, 1992

Hughes, H.C. *Sensory Exotica. A world beyond human experience*, MIT Press, paperback edition, 2001

Huhtamo, E. *Ressurecting the technological past. An Introduction to the Archaeology of Media Art*, published in InterCommunication No. 14. www.ntticc.or.jp/pub/ic_mag/ic014/huhtamo/huhtamo_e.html, 1995

Kaye, J. *Making Scents*, Published in Interactions, http://cemcom.infosci.cornell.edu/papers/making-scents.pdf, 2004

Keeley, B. L. *Making sense of the senses: Individuating modalities in humans and other animals.* Pitzer College, Revised version of this paper, Journal of Philosophy, 29 March 2001.

Keidan, L. and Brine, D. *Live Culture at Tate Modern, Fluid Landscapes*, The Live Art Development Agency, 2005

Knup, K. *The physics of a pump organ*, published in The Philomathean, vol 23.
http://www.bridgewater.edu/philo/philo96/knupp.html, 1996

Kuo, M. *Synaesthetic Politics of the Body* (http://www.govettbrewster.com/Publications/Visit+Online/1VISIT8.htm)

Leary, T. *The Politics of Ecstacy*, published by Palandin, 1970

Luria, A. R. *The Mind of a Mnemonist: A Little Book about a Vast Memory*, 1966, published by Harvard University Press; Reprint edition 2006. ISBN: 0674576225

Machon, J. *(Syn)aesthetics and disturbance. A preliminary overview*. Published in Body Space & Technology Journal, Brunel University, vol.1, no.2, 2001

Malin, J. *Interview with the Vasulkas - additional questions and thoughts to be included with this interview.*
http://www.vasulka.org/archive/Interviews/15MaLinJackie, Vasulkas.pdf, 1981

Manovich, L. *The Language of New Media*, The MIT Press, (online version: http://www.manovich.net/), 2001

Norman, D. A. *Emotional Design: Why we love (or hate) everyday things*, published by Basic Books. ISBN 0465051367.

Nelson, P. *Pitch Class Sets*, Revised 05.16. http://composertools.com/Theory/PCSets/, 2004

O'Sullivan, D. & Igoe, T. *Physical Computing. Sensing and controlling the physical world with computers*, published by Course Technology PTR. 2004, ISBN 159200346X

Paik, J. N. *Brussels.* http://www.vasulka.org/archive/Artists4/NamJP/KnokkeHeist.pdf, 1974

Pakes, A. *Art as action or art as object. The embodiment of knowledge in practice as research.* Working papers in Art and Design.
http://www.herts.ac.uk/artdes1/research/papers/wpades/vol3/apabs.html, 2004

Paterson, I. *A dictionary of colours*, published by Thorogood Publishing Ltd, 2003, ISBN 1854183753

Pickering, A. *Cybernetics and the mangle.* Asby, Beer and Pask. University of Illinois, 2002.

Plant, S. *Writing on drugs*, published by Picador, 1999, ISBN-0312278748

Plant, S. *Zeros + Ones*, published by Fourth Estate Limited, 1997, ISBN - 185702386

Ramachandran, V. S & Hubbard, E. M., *Synaesthesia: A window into perception, thought and language*, published in Journal of Consciousness Studies, 8, 3-34, 2001

Robles E. A. *The Spiritual in Art, Kandinsky Color Theory*, 4ever art-ezine, http://www.evertrobles.com/ezine4-002.htm

Roads, C. *The Computer Music Tutorial*, Published by The MIT Press. 1966, ISBN 0626680823.

Roof, J. *Depth Technologies*, essay in Technospaces - inside the new media, (ed)Sally R. Munt, published by Continuum 2001. ISBN 0-8264-5003-2

Ryan, S. *So what's so new about media art?* Published in Intellegent Agent, Vol 5 2005. http://www.intelligentagent.com/archive/IA5_2/newmediaryan.pdf

Spielmann, Y. *Video and Computer: The Aesthetics of Steina and Woody Vasulka*, http://www.fondation-langlois.org/html/e/page.php?NumPage=460

Timmers, R., Marlot, M., Antonio, Camurri, A, & Volpe, G. *Listener's Emotional Engagement with Performances of A Scriabin Etude*, An Exploratory Case Study, printed in Psychology of Music, 2006

TV as a creative medium, exhibition brochure, http://www.eai.org/kinetic/ch1/creative/pdfs/exhibitionbrochure.pdf

UK Synaesthesia Associtation, http://www.uksynaesthesia.com/agm.htm

van Campen, C. *Synesthesia and Artistic Experimentation*, PSYCHE, 3(6), November 1997, http://psyche.cs.monash.edu.au/v2/psyche-3-06-vancampen.html

Vassilieva, J. *Eisenstein and his Method:* Recent Publications in Russia, published in Senses of Cinema, http://www.sensesofcinema.com/contents/06/41/eisenstein-method.html, 2006

Vasulka, W&S. *The Opening of the Kitchen*, http://www.vasulka.org/archive/Kitchen/KOP/KOP002.pdf, 1971

Wadrip-Fruin, N. & Montford, N. *The New Media Reader*, MIT Press, 2003, ISBN 0262232278

Wagner, R. *The Art-Work of the Future, IV*. Outlines of the Artwork of the Future. (Translated by William Ashton Ellis), http://users.belgacom.net/wagnerlibrary/prose/wagartfut.htm, 1849

Wescheler, L. *Mr Wilson's Cabinet of Wonder*, published by Vintage Books, 1996, ISBN 067439986

Youngblood, G. *Expanded Cinema, Synaesthetics and Kinaesthetics: The Way of All Experience*, published by Dutton and Co., Inc, New York 1970.

Artist websites:

Knowbotic Research - http://www.krcf.org/krcfhome/

Golan Levin - http://www.flin_g.com

Joost Rekveld - http://www.lumen.nu/rekveld.html

Motherboard - http://www.liveart.org

Stelarc - http://www.krcf.org/krcfhome/

Usman Haque - http://www.haque.co.uk/

Vasulka Archives - http://www.vasulka.org/

Further links and references at http://www.notam02.no/motherboard/synaesthesia