The Practice of Live Cinema

Mia Makela

Abstract — **This paper is an examination of the artistic practice of live cinema, a recently coined term for real-time audiovisual performances. I will discuss the essence of contemporary live cinema by presenting its fundamental elements and comparing the methods of live cinema with those of cinema and VJng.**

I. INTRODUCTION

What is live cinema? According to the Transmediale festival[1] press release for its live cinema program in 2005 the term "Live Cinema has hitherto been used primarily to describe the live musical accompaniment of silent movies. But that was yesterday. Live Cinema today stands for the simultaneous creation of sound and image in real-time by sonic and visual artists who collaborate on equal terms and with elaborate concepts. The traditional parameters of narrative cinema are expanded by a much broader conception of cinematographic space, the focus of which is no longer the photographic construction of reality as seen by the camera's eye, or linear forms of narration. The term "Cinema" is now to be understood as embracing all forms of configuring moving images, beginning with the animation of painted or synthetic images."

As written in the press release, live cinema now addressed multiple forms of real-time creation. In fact, the term cinema in this context might be a bit misleading.

The difference between cinema and live cinema lies in their contexts and goals. Live cinema is not cinema. Live cinema is not linear story telling. It is not usually based on actors or verbal dialogues. Live situation imposes its necessities but also claims freedom from the linear structure of cinema. As traditional cinema is ostensibly trying to tell a story, shots where nothing is happening, even if visually powerful, tend to serve as transitions. The shots containing action and dialogue constitute the key moments of the movie. Repetitions are not commonly used, nor visual effects that would profoundly alter the visual information. Slow motion may be the most common effect used in cinema apart from the 3D effects. Nevertheless, many movies are famous for their atmosphere, enhanced by scenes which do not contain action or dialogues.

One example is *Lost Highway* (1997) directed by David Lynch, which is remembered for its long shot of a dark highway. I believe these kind of shots are the basic material for live cinema performances: the transitions, the movements, the pure visual beauty and intrigue, the atmosphere.

Live cinema describes work which is in essence artistic, to differentiate from VJng[2], which can resemble visual DJing. DJs don't produce their own material, they mix music, the same way as VJs can mix already existing material. This does not mean that VJs would not also create their video-clips, but there are many who consider that producing material it not necessary for a VJ, who mainly presents the contemporary visual currents of our culture. There also exists a market for selling and buying video-clips. This implies that many VJs can use the same clips. The act of mixing, remixing and selecting becomes the work of a VJ. Live cinema creators' goals appear to be more personal and artistic than those of VJs, and their work tends to be presented in different context, like museum or theatre, and often to an audience similar to that of cinema: sitting down and watching the performance attentively. This difference also creates different needs for the performance, as in clubs the public is not there mainly to see the visuals but to enjoy various sensorial inputs simultaneously.

It is a complex task to define what live cinema is content-wise, as the variety of different styles and contents is enormous, but apart from the actual content of the visual material there are certain issues or elements that seem essential for all live cinema performances.

In search of a trajectory I started defining live cinema by its components: What is needed in order to perform visuals in real-time? One component is projection. It would be difficult to imagine a live cinema performance without it (at the current moment). The second is performer/creator as the presence of a performer is what makes the work real-time performance, otherwise it might be an installation. Third element is the public, as if no one is watching, why perform? And the fourth element is the space shared with the audience and the performer projecting images. Real-time performance is also a time-based live event.

I will explore what constitutes the basic elements of live cinema and reflect on their effect on live cinema language, which, until now, only exists as a "spoken language"

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[2] VJ The term "Video Jockey" was first used to describe people who presented music videos on MTV, until the term metamorphosed to include video performance artists who create live visuals for all kinds of music.

without written grammar. I will reflect on the characteristics of each essential element and offer categories and terminology in order to create vocabulary for the proposed live cinema language. As there are many different genres in live cinema, and as the material can be both abstract and figurative, it is impossible to name just one approach in order to create meaning in a performance. Live cinema performance can be experienced as "live painting" as well as "live montage". In this paper I propose montage and compositing as possible tools for creating a performance. I also discuss the meaning and background of visual effects in live performance, as they play a crucial role.

I do not discuss in minute detail media i.e. actual visual material, music or tools. Most artists use video clips, Flash and 3D animations, even though generating abstract visuals with software such as Processing or VVVV is growing ever more popular. Some artists use game engines to create visuals (JODI) and some use online resources (WJs=Web Jockeys). Even the Google Earth web service can serve as material for a live show (Satellite Jockey). Also live cameras are used for projections (Hotel Modern).

The goal of this examination is to explore the essence of live cinema, rather than offer a comprehensive study of real-time audiovisual performance. For this reason I have focused exclusively on the elements and concepts that I consider specific for live cinema.

II. THE LANGUAGE OF LIVE CINEMA

What could be the language of live cinema ? In order to define first what is visual language, I will start by reflecting on the cinema language. As a point of reference, Alexander Mackendrick reflects on the silent movies in his article *The Pre-Verbal Language of Cinema*, as follows: "Cinema deals with feelings, sensations, intuitions and movement, things that communicate to audiences at a level not necessarily subject to conscious, rational and critical comprehension. Because of this, the so-called 'language' the film director uses may, in fact, make for a much richer and denser experience. Actions and images speak faster, and to more of the senses, than speech does. A recurring theme of these notes is that cinema is not so much non-verbal as pre-verbal. Though it is able to reproduce reams of dialogue, film can also tell stories purely in movement, in action and reaction. Cinematographic images, particularly when synchronized with recorded sound, deliver such quantities of visual and audible data that the verbal component (even, in the days of silent cinema, title cards) is overwhelmed and becomes secondary. Consequently, the essential and underlying meaning of film dialogue is often much more effectively transmitted by a complex and intricate organization of cinematic elements that are not only not verbal, but that can never be fully analyzed by verbal means."[1]

Silent cinema shares similar elements with live cinema, as neither uses verbal dialogues as the basis for communication. Silent cinema was also traditionally accompanied by live orchestra playing music in the movie theatres, which was sometimes referred to as live cinema. This tradition still continues and has recently gained new popularity as proves many events offering concerts with silent cinema such as "Live Soundtracks" in Barcelona.

A. Cinema language vs. live cinema language

The communication of cinema consists of shots and their order. Continuity is one of the key concepts of cinema. This is primarily constructed in the editing process, although camera work also plays an important role. Lighting, actors, costumes, make-up, scenery and props aid the construction of a scene.

In live cinema, many artists are one-person-bands, and construct the scenes, shoot the material, manage post-production and design and/or program their tools and/or interfaces to present the work, as well as perform the "montage" process in live situation. Many live cinema artists go around with their digital camcorders and record what they find visually interesting, then mix or process this material in real-time.

The cinema audience has become accustomed to the traditional narrative structure: The film begins by presenting the characters in their daily environment, soon after a conflict appears: Someone is kidnapped, falls ill, dies, is seduced, blackmailed or gets involved in a crime. Towards the end of the film a solution is reached through several crises. The narration in live cinema rarely follows this kind of structure, and I believe that it is possible to create "stories", expectation and tension also with different kinds of narrative methods.

In fact, poetry might offer a more adequate structural basis for live cinema as in poetry language is used for its aesthetic and evocative qualities in addition to its ostensible meaning. Wikipedia refers to poetry as follows: "Poetry, [...] often uses particular forms and conventions to expand the literal meaning of the words, or to evoke emotional or sensual responses. Devices such as assonance, alliteration, onomatopoeia and rhythm are sometimes used to achieve musical or incantatory effects. Poetry's use of ambiguity, symbolism, irony and other stylistic elements of poetic diction often leaves a poem open to multiple interpretations. Similarly, metaphor and simile create a resonance between otherwise disparate images—a layering of meanings, forming connections previously not perceived." [2] In his book "Sculpting in Time" the film director Andrev Tarkovsky writes in behalf of "poetic design of being" as follows: "In my view poetic reasoning is closer to the laws by which thought develops, and thus to life itself, than is the logic of traditional drama. [...] The usual logic, that of linear sequentiality is uncomfortable like the proof of a geometry theorem." [3] He also writes about the failure of cinema to exploit its artistic potential

and instead turning into a recording machinery of theatrical performance, of which results we are still suffering. [4]

In the Soviet film-making of the 1920s, montage was theorized to be the essence of cinema. In live cinema, the montage is constructed in real-time, but the theories can still give insights about how to construct meaning in live cinematic language. As montage is not a very useful tool for abstract imagery, I propose that the principles of musical composition could be helpful in constructing structure for non-figurative visuals. As such, I discuss two methods for constructing meaning in live cinema performance: Montage and Compositing.

B. Montage

In traditional cinema, story and dialogues are central elements of the films. The continuity of the story is primarily produced with montage techniques. Even though the Americans were more advanced in using montage in the early days of cinema, it was the Russian film makers, led by Lev Kuleshov, who theorized montage and considered it the essence of film language. For Kuleshov, montage was basically the organization of cinematic material. After studying various films with his students, he realized that the speed of which the shots were edited was essential. Moreover, he realized that the Russian public seemed to prefer American movies for this reason. [5]

Eisenstein experimented with various editing techniques he called intellectual, metric, rhythmic, tonal and overtonal. He cut his film *Alexander Nevsky* (1938) to the rhythm of preexistent music and not just had the music played or composed to match the film. He also discovered that film cut metrically to the beat of a heart had a profound impact on viewers as it mirrors our biorhythms. [6]

Eisenstein's montage techniques could also be seen as the beginning of VJing. The way he used sound as the basis of the visual montage is how contemporary live visuals are often presented. Eisenstein understood the effect of rhythm and juxtaposition on the viewer, just like the video scratchers. Video scratching was one of the first genres of live visuals, and was often politically oriented. Groups like London based Hexstatic and Exceeda seem to follow Eisenstein's footsteps. Hexstatic has also collaborated with Pioneer in the development of the *DVJ-X1* mixer, which was launched in 2004. With this tool it is possible to scratch, loop and cue video in real-time, while audio stays in precise synch with the video. [7] To some extent, Eisenstein's theories have now materialized as a product.

Montage can also be spatial. In most real-time visual software, the option for showing multiple image sources on one screen is built-in. Furthermore, it is very common to use various screens in real-time audiovisual events, even though only a few live cinema artists use spatial montage creatively. The Light Surgeons from London is one of them. They project multiple simultaneous visual streams with transparent and non-transparent screen and thus create an interesting dialogue between the image sources,

something that has only been seen in cinema sporadically, with Peter Greenaway being one of the few directors of the "spatial school". Curiously enough he is also one of the few film directors who perform visuals in real-time on his *Tulse Luper VJ Tour*.

C. Compositing

Many avant-garde film directors have used visual compositing in their films. In his 1926 film *Mother*, Pudovkin composites various shots of the factory buildings on top of each other thus creating an aesthetically pleasing sense of the actual shapes of the buildings against the sky. Still, the majority of films employ direct cutting from one shot to another. It was during the video era that compositing images became easier, thanks to new technology. Video synthesizers electronically created TV signals without necessarily requiring the use of a TV camera. Moving abstract patterns, text subtitles, colorized or processed camera images can all be in the output of a video synthesizer. The first analogue video synthesizers included the *Sandin Image processor* (1971-74), the *Rutt-Etra* (1972) and *Paik/Abe synthesizer* (1969).

Early Video artists like Woody and Steina Vasulka, who had already started experimenting with video synthesizers in the '70s, used compositing, with chroma and luminosity keying, as one of their methods for creating videos. As live cinema artists tend to use various clips or visual layers simultaneously, mixing them together resembles musical composition, in which various instruments are being played together, in different combinations of rhythms, volumes and patterns. Perhaps abstract visuals could be better analyzed as if they were music, including their compositional strengths and weaknesses, rhythmic structure, beauty, etc.

In *A Practical Guide to Musical Composition*, Alan Belkin describes: "A musical work has a "trajectory", engendering a kind of internal voyage in the listener. This voyage takes the listener over varied emotional terrain in a coherent way. The composer's goal is to engage the listener, to maintain his interest and to increase his involvement during the whole voyage, and then finally to lead him back to the normal, external world in a fulfilling way. We call the experience "balanced" when the listener feels satisfied with the experience as a whole. Of course, this does not mean that the experience is necessarily pretty or pleasant – the emotional world may be serious or even troubling - but that the work seems meaningful in an integrated way." [8]

These principles can give valuable insights to the inner structure of live cinema performance even if the material is abstract. Rhythm, dynamics, movement, direction, speed, color, intensity and richness are important in a live performance, besides the imagery. These elements can be still further strengthened and contrasted in dialogue with the audio.

D. Visual effects

Visual effects have their own language as well, even though the connotations can differ according to the context. In cinema, certain effects have already established commonly accepted meanings, i.e. : When an image starts to get blurry it signifies that a dream or a memory sequence is starting. Some directors, like Tarantino, have used frozen frame, to mark a meaningful moment in the film. Effects in general are fascinating probably for the reason that they show us the world in a way we cannot experience in real life, as in real life we are continuously perceiving only the present moment. From the dawn of real-time projections, effects have been sought after for their "magical" qualities. Even the early magic lanterns had built-in dissolve effect and options for mixing between various image layers. Video performance pioneer, Carol Goss describes her sensations of feedback effect in her article *Driven to abstraction* written in 1998, as follows: "This loop between the camera viewing the cathode ray tube and the cathode ray tube displaying the image of the electron beam slightly off centre, magically created a dynamic image with multiple interpretations of itself - all depending on how you played with the aperture, focus, or angle of the camera. […] One was always aware that one was collaborating with the raw force of electricity.[…]The feedback images resembled mandalas. Any sixties person would recognize this instantly. The question was, "why?". Which came first: the Buddhist mandala or the electronic mandala? Was Itzhak Bentov's theory of the universe as a torus with all energy moving in a helix the basic paradigm, and video feedback and Buddhist mediation mandalas just manifestations of it?" [9]

The words "magical" and "amazing" are used often by the artists when they describe their sensations of creating real-time visuals. There is also a connection with hallucinogenic experiences, as some effects seem to recreate the patterns seen on LSD. The altered states of the reality.

It is interesting to note certain similarities between the early video art scene and the contemporary live cinema and the VJ scene. These all share the eagerness to explore the new visual tools and build cheaper equipment in close collaboration with engineers and programmers. The early video artists had a magazine called *Radical Software*, a copyleft product, promoting the idea of access to the tools of production and distribution and the control of images. Their politics were a reaction to the TVs supposed social control, similar to the contemporary concern about globalization and consumerism, and the power of IT-giants over individuals. DIY-movement and free software movement are both closely connected to live visual scene. One good reason for this is that the optimum tool or software for creating visuals in real-time has not been developed yet, so new software are being released in a growing speed. Nowadays there exist more than a hundred software specialized for live visuals.

III. ELEMENTS OF LIVE CINEMA

A. Space

Live cinema performances occur in a space shared by the performers, their tools, projections and the public. A performer covers various spaces simultaneously during her performance. I have divided these spaces into 5 different types according to their characteristics: digital, desktop, performance, projection and physical space.

Digital space

Optimizing and compressing are two essential activities in digital space. They are specially relevant for live cinema artists who work with video material, as uncompressed digital video occupies huge blocks of digital space. One minute of full quality video can take up over one Gigabyte of digital space. Also processing "heavy" videos in real-time would demand a lot of RAM (Random Access Memory), very fast processor and a good graphic card. Without compression techniques it would be practically impossible to work with video on a normal computer. Nor would it be possible to watch videos online or on DVDs. Ron Burnett has written about the era of compression in his book *How Images Think*, as follows: "What do compression technologies do to conventional notions of information and image? This is a fascinating issue, since compression is actually about the reduction of information and the removal through an algorithmic process of those elements of an image that are deemed to be less important than others. The more compressed, the more that is missing, as data is eliminated or colors removed. The reduction is invisible to the human eye, but tell that to the image-creator who has worked hard to place "content" in a particular way in a series of images and for whom every aesthetic change is potentially a transformation of the original intent." [10]

Desktop space

Desktop space is the work space for laptop performance artists, as it is the background for the interface of the software. For software which contain so-called "open architecture", like MAX/MSP/JITTER, PureData or Isadora, desktop space is essential. In these cases the artist creates the interface or patch, as it is called, by choosing so called objects from the object library, connecting them to each other with cords and adding different parameters (controls) to the objects. The metaphor for these kind of interfaces is the video signal (cord), which goes through all the objects in the patch. If the continuity of the signal is cut, there is no video output.

The interface can occupy more space than is available on the desktop. This is already taken into account in the design of these software, as there are several options available to

"compress" the patch using sub-patches. Furthermore, other methods lie at the artists disposal, like changing the size of the objects (Isadora). Therefore, desktop space becomes a multiple space where the invisible and visible can be continuously altered depending on the needs of the performer. The design of the interface / patch should be also optimized for an intuitive and fast way of working.

Personalizing the interface is one of the most interesting qualities of the open architecture software. Basic software like Arkaos, which offers an interface in which video clips and effects can be activated with keys on the keyboard, could catalyze a visual show where different clips can be changed rapidly and even randomly. In an open architecture software like Isadora the user has to create a special patch to be able to change clips with the keyboard, and on the process could discover other possibilities.

Performance space
The performance space is where the performance takes place. Everything that is included in the performance in one way or another belongs to the performance space. This varies according to the performance, although still the most usual setup for live cinema is a stage where the performer is located with her equipment, with the projection screen behind her. In this case the stage is the performance space. Live cinema artists can also work for example with dancers which means that there are more performers and the combined space of action becomes the performance space.

Projection space
The projection space is the space filled with the projections. Many live cinema performances are presented in a cinematic 2-dimensional setup, where one or several rectangular screens are facing the public. There are other possibilities as the projection surface does not have to be a flat surface. It can be a human body, a table, a building, etc.

Cinema remains a flat-screen based medium, while live cinema and installation artists are exploring the possibilities of expanding the screen and changing our audiovisual experiences into audiovisual environments.

Physical space
Physical space is the space shared between the audience and the performer. All the other spaces of live cinema lay inside the physical space. The physical space defines the setup of the performance. The space can have arcs or other architectural elements which can limit the visibility of the projections for the audience. It is also important to explore the physical space before mounting projectors, as bigger projections require more distance from the screen. Care must also be taken to ensure that projectors are located in such a way that the audience does not obstruct the beam. In site-specific projections the physical space is the starting point for planning the performance.

B. Time

As the title already suggests, the difference between cinema and live cinema is that in the latter something is done live, in front of an audience. What qualities does live give to cinema? Seeing the creator presenting her work is different to watching a movie: There is a possibility of instant feedback both ways. The live context enforces the possibilities of participation of the audience. Also most performances are not documented. They become moments shared between the artist and the audience, unique and difficult to repeat.

Improvisation
Live situation also calls for improvisation. As musicians can jam together for hours, on improvisational basis, a similar kind of jamming can happen also between live cinema artists and musicians, allowing intuition and collaboration to take precedence over following a previously defined plan. This is an interesting challenge, as communication between the performers becomes literally audible and visible to the audience. Musicians and visualists can improvise on what they see and hear. This is actually easier to say than to do. In most audiovisual performances, it seems that the visual artist is improvising to the music already composed by the musician. Some visual performers attempt to make the visuals react to the music on rhythmic basis, while others construct audiovisual performances where the image and the audio are in constant dialogue.

Rene Beekman claimed at the symposium That Media Thing, in 1999: "Interestingly and strikingly enough, almost all efforts toward developing new computer software which could enable new ways of processing video almost all stem from the field of music."[11]

There have been various attempts to build instruments which would allow visuals to be played while the performer moves her body. On the other hand, if visuals are played with instruments similar to a guitar, or a piano, what does it tell us of the true nature of the image ? What constitutes playing visuals ? What could be a visual instrument ?

Live vs. real-time
When we see "Live from New York" flashing on the TV screen, we know that the image is "real", this is what is really happening. Normally the effect of "realness" or "liveness" is enforced by certain "reality effects", like a hand-held camera or even technical problems which makes us recognize the output as more "real" than the carefully chosen, edited and manipulated image material normally transmitted. Does live equal real life ? In real life, technical problems can occur, and as such, in performance, weather conditions and human factors like nerves can hamper the smooth outcome of the performance.

Computer-based work is already a real-time environment, for example, the movement of the mouse is rendered as the movement of the cursor without delay and received immediately. Computer games function on the same basis. However, in the live cinema context there are different levels of real-time. Mixing video clips can happen in real-time, as the performer makes simultaneous choices. The visuals can also be generated in real-time. A further example is the image created by live camera, which can be modified using real-time video effects in which case the production, processing and the output reception are simultaneous.

Loop
The production of electronic music is based on samples, and their repetitions and variations. Similarly, video clips (or algorithmic programs) are the basic elements of real-time visual performance. In cinema, different shots are edited together linearly, and each of them appears only once during the movie. I use the term "presentation time" to describe the time a visual element is visible to the public. In cinema, the duration of the shots equals their presentation time. In live cinema the presentation time can be longer than the actual duration of the clip. This is caused by various repetitions of the same visual sequence during the performance. This means that even if a clips duration is 10 seconds, it can be presented in a loop for a minute or longer. The clip can be also presented various times during the performance. In a "cinematic" loop, the beginning and the end of the clip is different which appears evident to the audience. Seeing the same loop over and over again could become tiring after several repetitions although sometimes this can add extra value to the performance, like repeating a movement which becomes ironic in the long run. In this case, the careful selection of the loops and their montage are the basis of the work and video scratchers like London-based Hexstatic, Cold Cut or Exceeda have done excellent performances using this method. In these cases, the interaction with music is crucial for the success of the show, and the three groups mentioned are all audiovisual groups who synchronize music to fit their images perfectly.

Another type of loop is what I call an "endless loop" or "seamless loop". In this kind of loop the beginning and the end are so similar that the clip seems to continue without a cut even though it is looping.

One example is a landscape where nothing seems to happen, until someone appears in the scenery and then leaves the image. The cut is done when the person has left the image, thus the beginning and the end show the same landscape and continuity of the loop appears seamless. With many repetitions, the exact duration of this kind of loop can also become obvious, but until that point, the loop's presentation time has exceeded its actual duration. The endless loop seems to offer more presentation time in the performance.

So why is presentation time so important ? Real-time performances are based on looping material. Real-time software automatically loops all clips until told otherwise. Let us imagine a performance which lasts one hour, where the artist has a library of video clips each lasting 15 seconds. If each clip were shown only once, the artist would need 240 clips, which is quite a lot to handle during the performance, not to mention the time consumed on the production of the clips.

C. Projection

Spatial projection
In live cinema performances, cinematic set-up is common, although there are many other ways in which to use projections. Unlike cinema, live cinema incorporates the setting up of projections as part of the creative process. The extended cinema artists, as well as contemporary installation artists, have done plenty of experimentation with projections. One of the goals has been to create spatial experiences. A Canadian video artist, Rebecca Belmore's video work, *Fountain*, exhibited in *Venice Biennale* 2005, was projected on falling water. In this case the sound of the water transformed it into an audiovisual screen. Many artists and VJs also used different shapes like balls as a projection surface and transparent screens which create 3-dimensional effects.

A recent example of spatial experimentation is the 360-degree *Pictorama* project at *SAT (Society of Arts and Technology)* in Montreal. Sebastian Croy, with his group of students from the University of Montreal, launched in 2004 a free software *LightTwist* in order to automatically adjust the projected images onto the projection surface and various artists have been exploring the possibilities of spatial montage. In this case, as well as in the example of Jeffrey Shaw, the projection becomes an environment, and thus calls for spatial narrative, as the viewer can not see all of the image simultaneously. Surround audio is already a well known concept. It is a very different concept for visuals, but nevertheless interesting one, especially as audio can support the visuals in order to draw public's attention to a certain direction.

Mediatecture
A projector is not the only possibility with which to show visuals. Computers can be directly connected to LED screens which are more powerful light sources than projectors. Interactive media facades which use LEDs are interesting also from an architectural point of view, as projection surfaces could be implemented in the design of houses. Facades can also be reactive. i.e. the external input like weather, pollution, noise or movements of people could determine the content of the visuals.

Tangible screen
The projection can also function as an interface like in

the case of Alvaro Cassinelli's *Khronos projector*, described as a video time-warping machine with a tangible deformable screen. It explores time-lapse photography. The audience can interact with the image by touching the tangible screen and therefore, effectively go back and forth in time.

As these examples show, projection is a flexible concept. We can understand projection as an interface, as in the case of the *Khronos Projector*. Or as an environment as in the case of Pictorama at SAT. These kinds of projects give an idea as to what projections might become in the near future, and how they could change the concept of performing visuals in real-time. One prognosis is that the projected image could turn out to be the best visual instrument for real-time performance, as also the performer's body would become an integrated part of the live show.

D. Performance

What is the role of the performer in live cinema ? In the Wikipedia, performance art is defined as "art in which the actions of an individual or a group at a particular place and in a particular time constitute the work. It can happen anywhere, at any time, or for any length of time. Performance art can be any situation that involves four basic elements: time, space, the performer's body and a relationship between performer and audience. It is opposed to painting or sculpture, for example, where an object constitutes the work". [12]

In most laptop performances the audience sees the performer standing or sitting behind the computer, attentively watching the monitor while moving the mouse and pressing keys on the keyboard. The Laptop performer resembles an operator who carefully performs tasks with the machine more than a performer in the traditional sense of the word. According to the the *ClubTransmediale* 2004 press release: "The laptop hype is over. Laptop performers, who resemble a withdrawn scientist publishing results of laboratory research, are now just one role-model amongst many. Electronic music takes a turn towards being more performance based, towards ironic playfulness with signifiers and identity, and to being a more direct communication between the public and the artists." [13]

The question arises of how to form a relationship with the audience and create "liveness" during the performance? This can be a challenging issue in a laptop performance, as the audience can not see what the live cinema artist is actually doing with the laptop. How would the audience know if they were watching a playback of a DVD ? It is also challenging for the performers, to perform and use the software at the same time, as in the live situation the computer screen normally requires their total attention.

After a performance I am often asked what I did live. I wonder how the experience of watching visuals changes by knowing whether it is done live or as playback ? In TV shows, musicians play electric guitars, while it is obvious

that it is playback as the guitar is not even plugged into the amplifier. The musician's presence is more important. On the other hand, there arguably exists a certain sense of betrayal and doubt on the part of the viewer. London based Slub has resolved this problem by using two projections; one with a view from from their desktop, which in their case shows how they use only command line to create the audio and the visuals, and another with the view of the results. This enables the audience to know what they are doing, which in their case is coding. In this case, their bodies still remains static and the attention focuses to the projection screens.

It is quite obvious that a laptop is not the best tool to bring the body into the performance, as concentrating on what is happening on the screen limits the physical actions to moving the mouse, or turning knobs on a midi controller, which might not be the most interesting sight for the audience. On the other hand, the necessity to "prove" liveness can lead to performances where live becomes the "content" of the show rather than integrated part of the performance. There are audiovisual groups who have successfully united liveness and content, including the Swedish audiovisual group AVCENTRALEN. At the Pixelache Festival, in Helsinki in 2003, their whole performance was based on live camera work. They had set up a "visual laboratory" of different miniature scenes; in one they dropped colored powders into a glass of water which was shot (close up), with the video camera. In the projection, the image from the camera had transformed into an abstract visual world resembling space travel. Without having seen the setup, it would have been impossible to define how the projections were produced. In this case, watching the process of "creative misuse of technology" and the results became interesting for the public.

Justin Manor, MIT graduate (2003), wrote his thesis on gestural performance tools for real-time audiovisual performance. He also produced the *Cinema Fabrique* instrument, which allowed the control of the audiovisual environment with gloves, especially designed for real-time visual performance. Data gloves and sensors are also the performance tools of S.S.S Sensors_Sonics_Sights, a performing trio formed by Cecile Babiole, Laurent Dailleau, and Atau Tanaka who take laptop performance to another level by creating the audiovisual worlds by their movements and gestures.

In order to fully implicate the body in the performance, visual instruments, data suits, data gloves, and sensors are used to allow the body of the performer to be more active. Using this kind of equipment requires technically demanding set-ups and also programming skills. Controlling the performance with gestures and movements is also a valuable skill as gestures can limit the whole range of possible controls available in the software. Another issue is the meaning of the gestures in the performance. Should they have a corresponding effect in the visuals ? Without this kind of correspondence the performer's actions can

become vague for the audience. In a piano concert, when a pianist presses the keys, the sound immediately corresponds to the actions of her fingers. If the pianist plays faster, the speed of the music accelerates. If this correspondence were to suddenly disappear, the audience would immediately think it were a playback. The key concept in gestural interfaces is real-time correspondence between the actions and the results.

I believe that in spite of the new possibilities offered by digital technologies, the content of the performance should still count the most, and an interesting audiovisual experience as a whole is worth striving towards, with or without the involvement of the body. "Classical" video mixing and processing can offer fascinating insights to the nature of images. Even though performance is a vital element in the live context, creating new narratives for visual culture should be equally important.

E. Public

In cinema the public does not generally have a very active role, though the experience of watching a movie cannot be called passive either. In cinema the public does not participate in the creative process of movie making, although the viewer can decide which films they watch and thus choose which directors have more possibilities to get funding for their work in the future.

In the 60's video artists responded to TV's "one to many" formula by transforming the signal and creating video installations, where the viewer formed part of the work. Video cameras played a central role in these experiments. In these installations, the viewer became the protagonist and her body and actions played a central role. Many installations did not exist without the viewer's presence. In Bill Viola's video works like *Instant Replay* (1972) the viewers' image is captured and presented in two monitors in the exhibition space. In the first monitor they see themselves in the present moment and in the other with seven seconds of delay. These installations were also called "video environments", and they paved the way for the interactive installations of the 90s, in which computer controls the environment. Virtual reality environments are perhaps the most immersive experiences for the public.

Messa di Voce, is an installation designed by Golan Levin and Zachary Liebermann in which several visitors can interact with the environment simultaneously. The visitors control the projections by their voice and gestures. Their gestures can make different shapes and forms, in bigger and smaller sizes, depending on the volume of their actions. Therefore, playing with the projections resembles performing.

How to involve the audience in live cinema performances? Many performers use cameras in their performances which allows the public to become the protagonist of the projections. Cameras are also used as sensors to track motion, which has become more and more popular lately due to applications like SoftVNS, Isadora or MAX/MSP/JITTER, which offer objects for tracking. The idea of the public as the user/performer of the visuals is attractive one, although the question arises: would the performance then become an installation ?

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