

Live Music for Moving Images:

Experimenting with customized musical instruments, sound systems, and performance techniques

Tero Vänttinen

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Aalto University

School of Arts, Design and Architecture

Department of Media

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1 Introduction

The following pages discuss two projects, in which a musical score was realized to accompany moving images. The musical accompaniments were actualized by using experimental means, e.g. self-made instruments and sound systems created specifically for these projects. The written part of my thesis documents these projects as carefully as possible, scrutinizes different phases of the making of these projects, contemplates the benefits and disadvantages of the techniques being used, and tries to establish these projects within a larger artistic context.

In the first chapter I explain why I have chosen this particular topic as the subject of my master's thesis. I talk about my background in the field of media, music and sound art. I also discuss the aim of both my artistic work and the written part. In the second chapter I continue from my motives and personal history to the history of silent film and its use of music. I research the history of silent movie accompaniments and follow the trajectory of its evolution. This is essential in understanding the origin of film music and the history of musical accompaniments. Chapter three is dedicated to customized and experimental instruments. I talk about self-customized instruments and the anatomy of my setup in the audiovisual group Cleaning Women. In chapter four I write about accompanying moving pictures, in this case the accompaniment Cleaning Women prepared for George Méliès's classic film *A Trip to the Moon*. I explain the structure of the accompaniment and introduce my praxis in making and performing live accompaniment for a film. In chapter five I write about the soundscape and musical accompaniment that was made for a live cinema performance called *I-files*, in which I tried to create something new - on personal basis - for the concept of live cinema, based on the knowledge I had gained making traditional silent film accompaniments. Finally, in the last chapter I estimate the success in carrying out these projects, and ponder the advantages and disadvantages of the use of technology in making music and sound art.

1.1 Audio technology and creativity

In 1857, the human voice was recorded for the first time in history. This was achieved with mechanical audio technology; a device called *Phonautograph*¹. It was only meant to represent sound waves in graphic form, not be listened to, and there was no technology to play it back.

It took over 150 years until audio technology made it possible to play back the ancient recording in 2008. It was scanned from the original master, a paper covered with soot, and graphically encoded into a digital file to be heard for the first time after its capture over 150 years ago. (Cowen, 2009)

If one is experimenting with music in the 21st century one cannot avoid the ubiquitous audio technology. It is so common in our everyday life that we do not pay much attention to it. We

¹invented by Édouard-Léon Scott de Martinville in 1857. (Sterne, 2005)

listen to music everywhere; in our homes, in the workplace, cars, while jogging.... We listen to it from our computers, iPads, stereo systems, radios, c-cassette players and whatnot. Digital audio processing tools can be accessed easily by downloading an audio freeware, such as Audacity. Even more common use of audio manipulating techniques are increasingly accessed with smart phones, for which there is a growing selection of audio-related applications.

I have never been particularly interested in technology per se, but experimenting with sound and music with the help of technology has been an intrinsic part of my life. I was about seven years of age when I realized that the auto-return mechanism of the record player at my childhood home didn't function properly. I could make vinyls spin freely back and forth with my finger, and listen to the material slowing it down, speeding it up, or even listening to it playing backwards. When I got my first cassette player in the mid-80s, I inherently realized I can modify a c-cassette by cutting bits off of the magnetic tape thus creating an edited version of the original material. I dismantled a c-cassette and created a loop with the magnetic tape cutting and splicing it with a piece of transparent adhesive tape. When I got my hands on a double-deck player I was able to overlay separate live takes using the machine as a primitive multi-track recorder.

Only later did I realize that my childhood experiments with audio technology were a bit similar to the experiments Pierre Schaeffer made with disc-cutting lathes and tape machines in the late 1940s and 1950s, thus creating *Musique Concrète*.

According to Schrader (1982): "Schaeffer spent several months experimenting with technology available to him. He discovered that he could record sound material on locked-groove discs that repeated instead of spiraling inward like normal phonograph records. These locked-groove discs allowed him to make loops of sound that created repetitive rhythmic patterns." Schrader continues: "Using these techniques and sound effects recordings of trains, Schaeffer composed the *Étude aux chemins de fer*, the first piece of *musique concrète*, in April 1948. This three-minute work contains various train sounds: wheels clacking along the track, steam escaping from the boiler and cylinders, whistles calling out various signals. Schaeffer decided to call his work *musique concrète* because of the ways it differed from "traditional" music. Instrumental music, he noted, was "abstract" [.]" (Schrader, 1982)

My experimentation was nothing but a joyous epiphany and the first wobbly steps into the field of sound manipulation. But in one way it was similar to Schaeffer's. Even though my experimenting was neither meant to, nor did it revolutionize sound art, it was accomplished by using technology that had become available. Or even better, the new technology allured me to experiment with sound manipulation. In the case of *Musique Concrète*, the new technology enabled the creation of something different than was previously done, subsequently building up into a new form of art. Of course, *Musique Concrète* was not fueled only by technology itself – rather that cognition – but I am confident to claim that *Musique Concrète* would never have existed without the new audio technology Schaeffer and his contemporaries were able to experiment with. Therefore it is a decent

example showing that whenever a new technology emerges, it opens up new possibilities for artists. Eventually it will lead into new aesthetics in art.

In Schaeffer's era, the possibilities to sculpture audio were quite limited compared to 21st century, where the possibilities to process audio is practically unlimited. Digital technology has revolutionized the production, editing, and processing of audio. Graphical programming softwares Pure Data and Max/MSP allow almost infinite possibilities in digital sound manipulation. Logic Studio software - affordable for a dedicated audio hobbyist - gives considerably more possibilities to sound processing than a professional mixing studio did in the seventies.

Technology and creativity can go hand in hand, but even though technology helps the creative process, creativity is not based only on technology. It is based on ideas, either recycling old ones or inventing new ones. Creativity also often accumulates from coincidences, serendipitous mistakes, when you end up somewhere you never would have thought of going. This is what I find interesting in making music. Actually, I believe these "accidental mistakes" are essential when creating something new.

Can a mistake be creativity? I believe whenever any technology is used in the process of creating art, it automatically has an effect on the work process and end result. For an artist, a proficient use of techniques and technology in one's artistic field – especially when performing live – is relevant, but what about a mistake that is determined by chance? Film director David Lynch has a creative approach towards sound, creativity and accidents, as he explains in the book *Soundscape*:

"But I like accidents, too. So you create situations where you can have sound collisions, places where sounds come together unexpectedly, and see what happens. Ninety-nine percent of it could be, you know, baloney, but you might come across one magical thing that leads you into another direction, and that might be the thing you're looking for. Sometimes when you're in doubt or you don't have an idea, creating accidents can break through to some places where you want to be." (Sider, Freeman and Sider, 2003, p.50)

Film sound designer Randy Thom explains how in Hollywood professionals are hired based on an assumption that they do not make any mistakes, because making mistakes is inefficient. He does not agree with this logic: "Well everybody who knows anything about art knows that that's anathema to the creative process. Mistakes are an absolutely necessary part of every creative process; that's the only way you figure out what will work and what won't". (Sider, Freeman and Sider, 2003)

John Cage used chance as the driving force in many of his works. According to Manning: "Cage in particular was concerned with exploring principles of indeterminacy: *Williams Mix* [1952] and *Imaginary Landscape No. 5* [1951–2] were based on "I Ching" chance operations, involving an elaborate series of tape-splicing and looping routines." (Manning, 2004, p.75)

In many cases, an accident or a mistake can help to continue and improve one's work. When working with audio technology, accidents and mistakes tend to happen. Wrong buttons are pushed,

cords are plugged in the wrong inputs, settings happen to be incorrect etc. Sometimes the unexpected outcome is fresh and surprising, and thus usable. I believe this kind of “chance-determined creativity” is essential in making art. In my opinion, art is full of these kinds of serendipitous accidents.

1.2 Thesis plan

This text follows the realization of two projects I have been involved in. One is a musical accompaniment to George Méliès’s classic short-movie *A Trip to the Moon*. The music was written and performed by an experimental group *Cleaning Women*, of which I am a member. The other is a live music and soundscape for Mia Mäkelä’s live cinema performance called *I-files*. I have chosen these two artistic works because they have certain similarities, but *also* interesting divergencies.

Silent film accompaniment is a form of art that flourished almost a hundred years ago. Live cinema is rather new form of digital art (I elaborate live cinema more closely in subsection 5.0.1). Still they have a lot in common; a moving image that can be colored with sound in various ways. I also consider that these projects are important in the continuum of my personal artistic work, especially when examining the working methods. *Cleaning Women* is a homogenous group; the three of us have been playing and composing music collectively for over 15 years. However, this is not the case with the *I-files*, in which I met media artist Mia Mäkelä approximately three weeks before the live cinema session was about to be held. I composed the audio setup and soundscape by myself instead of being a member of a group. Yet the origin and the content of these projects are the same; live music for moving images.

I try to search for the essence of a good live musical accompaniment and find answers to these questions: What ingredients do there have to be in order to make a fluent accompaniment? How can technology be used to enhance expression? Does technology affect the content? I ponder how digitalization has changed live performances. I also write about the history of musical accompaniments and try to locate my artistic works on the musical map and the continuum in sound art.

This thesis is not about the art of programming computer music. It is not about audio technology itself, rather about the creative use of audio technology. It is not about film music theory in general, i am not going very deep into the field of film music theory itself, instead I am writing about making music for these specific projects. This thesis is not a study, it is a subjective treatise of two artistic works I have been strongly involved in, combined with historical background information and some personal research I have made to put these works into context.

My working method has been: act first, analyze later. By going through all my notes, recordings and visual material I have looked back to the artistic decisions that were made doing these projects. Subsequently I have searched for related literature in order to reflect and contextualize the projects

in a wider context.

When I was making these projects I was not actively aware that I was working on projects that would become part of my thesis. Fortunately both performances were documented, but the audiovisual documentation is of poor quality. However, they can be found on the included DVD to help the reader to understand what is discussed in the text.

I hope that this text will give something to a person who is interested in musical accompaniments or is making music for cinema. It should also be of some interest to a person who is experimenting with sound for live cinema. The topic I have chosen to do my Master's thesis on - experimenting with music for moving images - is something I found fascinating. It is constantly being studied and further developed in today's sound and digital art field. Personally it also gave me a good reason to try something new in a musical perspective in order to create my composing skills and performance techniques.

1.3 Clarification of terms

In the text I write about *performance techniques*. I use this term basically for two different meanings, which are two sides of the same coin. I either use it to refer to the techniques a certain instrument is played with, e.g. playing with a bow, hitting with a stick etc. or to refer to a technique that is related to the whole performance situation, e.g. communication between other members of the group, taking the audience into consideration etc. I have tried to make clear each time with which meaning I use the term.

By the term *sound system* I am not referring to a PA system, but a smaller unit of a personal setup. It refers to everything that is used to produce and process the sounds before it goes into the PA system, including the musician's ideas and techniques of playing the instrument, musical instruments being used, microphones, effects units, hardware and software, cables and DI boxes.

2 Use of Live Music and Sound in Silent Films

The silent film era lasted over thirty years; from the first screening of moving pictures in 1895, until the first film with synchronized dialogue in 1927, continuing until its rapid decay in the early 1930s. However, the term *silent film* is deceptive. In fact, movies have never been silent. Sound was essential to the moving picture since its inception, both in Europe and America. The only reason films were silent for over thirty years was because the technical innovation of synchronized sound was not yet invented. The screenings of the movies were seldom silent, and sound was used diversely to accompany the picture. In this chapter I will gradually go through the evolution of the use of sound and musical accompaniments in silent movie screenings.

2.1 Early years of silent film

Film was always meant to be shown with sound. After inventing the Phonograph in 1877, Thomas Edison looked for ways to capture and represent real life in visual form. His desire to combine sound with picture led to the innovation of an apparatus dubbed Kinetophone, a coin-operated machine for viewing films through a peephole, combined with a phonograph. What may come as a surprise to many is that Edison's original idea was to use the picture to accompany sound, not the opposite, as one could suppose. According to Cook (2004, p.5):

“Edison, in fact, envisioned a kind of "coin-operated / entertainment machine" in which motion pictures made by the Kinetograph would illustrate the sound from the phonograph[...]. More significant is the fact that the first viable motion-picture camera [the Kinetograph] was invented as an accessory to a sound recording device and not for its own sake.”

The synchronized sound proved to be too difficult to actualize, the Kinetophone had sound but it was not in sync. Ever since moving pictures were invented, different experiences were made for incorporate synchronized sound. There were many reasons why it was not possible; sound could only be captured on discs (or cylinders) and the discs were easily out of sync as stylus would jump out of the groove; the discs were relatively short whereas movies became increasingly longer; sound could not be amplified enough for large theaters etc. Even though a lot of experiments were conducted during entire era of silent film, it took over thirty years to develop a system that was robust enough. Up to this time, films were without synchronized sounds and had to be accompanied otherwise.

Fortunately, some evidence exists showing that music has had an important role right from the inception of cinema. Martin Marks studied the first ever movie screening by Max Skladanowsky in 1895, who held a commercial screening in Berlin almost two months before the first Lumière

exhibition. The musical sheets from both this occasion and Skladanowsky's later screenings have been preserved. From them it is possible to see that (very likely even in the first screening) the musical accompaniment was carefully fit to match the images. (Marks, 1997, pp. 31-32)

Because of the nonexistent tradition of watching moving pictures, the audience acted very versatily in the early screenings of cinema. According to Altman (2004): "Like the accompaniment provided by the exhibitors, the accompaniment provided by the audience varied widely during film's early years." (Altman, 2004, p.88) When the picture came alive to audience's astonishment, the lack of sound made the experience uncanny, even though the action on the screen resembled real life and was otherwise comprehensible.

Talking and commenting on the film was common and the raucous audience is claimed to be one of the reasons why music was used in the early days of cinema screenings. It was needed to guide the viewers attention towards the film, thus making them silent. The other two reasons, according to Anderson (1988, p.12), are to "cover the sound of the projector and to overcome the "ghostliness" of the images."

The accompaniments varied and they were done in many different ways, as Altman explains; "Evidence remains of music, sound effects, and lectures, produced by live orchestras, stagehands, phonographic recordings, or the human voice." (Altman, 2004, p.88) In many cases, piano was the essential instrument to accompany a picture, often with a trap set.

The use of music has been neglected throughout the early years of cinema, thus making it hard to research. Musical scores have been lost, the reviewers often did not mention music in their reviews, the musicians are long gone and many accompaniments were improvised.

2.2 Golden era of silent film

In the turn of the 20th century, moving pictures were widely considered a novelty or light entertainment, that would soon give way to new inventions. It was definitely not considered a form of art. Nevertheless, audiences around the world were fascinated by these entertaining images from other countries and cultures², and the interest towards the moving pictures did not wither as it was expected. In the Nickelodeon period³, music was not yet used for narration. Popular songs of the time were played to accompany the movies and it was common for the audience to sing along. It was not until the 1910s when the music started to gain bigger role as a narrative element.

The first collections of cue music for films were published in the end of the first decade of the 20th century. According to Cooke (2008): "in 1909, Edison pictures in the USA started publishing cue sheets in the pages of its *Edison Kinetogram* to encourage the selection of appropriate musical

²e.g. Verdensteatret in Tromsø, Norway. It is the oldest cinema in Norway - opened in 1916 - that was built as a cinema, and is still functioning as a cinema in virtually the original form. Verdensteatret means "The World Theatre" and the name was given because it was thought to bring the whole world into the small village of Tromsø.

³Nickelodeon - a term coined and used in America - was a permanent theater specialized in showing films. The admission fee was 5c, a nickel, hence the name.

numbers from both classical and popular sources to accompany screenings of its films, and a range of similar suggestions began to appear in the trade press.” (Cooke, 2008, p.15) The term cue sheet is often used of any paper, that has markings of the music and how it is used in relation with the picture. However, Altman (2004, p.346) claims that these were not cue sheets rather than “musical suggestions” or “music cues”. This is how Altman defines cue sheets: “Whereas musical suggestions appear as part of a publication that is sold separately, and which contains far more than music cues, cue sheets were distributed as a separate commodity, in some cases by film producers and distributors, in others by music publishers or independent cue sheet companies.” (Altman, 2004)

The development, both in Europe and US, started to aim towards deeper and more controlled movie experience, thus making film exhibitors to pay attention towards sound and music. The first real theaters, that were built for cinema screenings only, started to appear in the 1910s. Theaters became bigger and often seated more than a thousand people, at least in the US. The growing film industry had to put more emphasis on the musical accompaniments. "The industry's campaign to standardize sound was supported by three related developments: larger theaters, longer films, and systematic introduction of a second projector" (Altman, 2004, p.249). In 1912, first Photoplayers were installed in theaters ⁴. Also, longer films with more complex story lines needed more efficient accompaniments.

In Finland, a piano and strings were typically used to accompany films, along with various other instruments, such as mandolin, guitar, harmonica and wind instruments. Musicians were hired on a regular basis. Occasionally local marching bands were used for accompanying films. The amount of musicians varied from a single pianist to commonly used trios and quartettes, all the way up to 13-15 musicians. In the grandest premieres even a 30-piece orchestras were used in the biggest Finnish cities. (Juva, 1995)

According to Altman (2004), D.W. Griffith's *The Birth of a Nation* in 1915 was the first film to travel America with a thoroughly arranged accompaniment written and compiled by Joseph Carl Breil. It was accompanied with a big orchestra, varying from 40 people upwards depending on the theater's capacity. Even though the ticket prices were much higher than normal, the movie was a huge success, thus inspiring the industry to carry on with the practice of well-compiled accompaniments.

In the 1920s, when live accompaniments were still a common practice, the thematic use of music as we know it today started to establish, including musical themes and leitmotif⁵. It happened side by side with the other developments in movie storytelling, e.g. montage, close-ups and camera techniques, which, like the use of music, took a while for the audience to understand and approve.

One interesting fact in the use of music was the music was also used during the shooting. The

⁴Photoplayer is a sound effect cabinet, built into automatic piano. Photoplayers “were the first instruments specifically conceived for motion picture accompaniment.”(Altman, 2004, p.327)

⁵Translated literally, “Leitmotiv” means “leading motif. [I]t refers to a musical idea that serves “to guide,” or “lead,” the listener through the narrative. (Wierzbicki, 2009)

music was played to set actors in the right mood or make them move effectively (as seen e.g. in the famous working scenes in the film *Metropolis*). According to Cooke (2008): The importance of music as a mood-enhancer in early cinema was reflected in the common practice of having live or recorded music played on film sets during shooting to inspire the actors[.]”

2.2.1 Cinema organ

One musical instrument – too absurd to be left unmentioned in the silent movie accompaniment history – is the theatre organ, also known as the cinema organ (and sometimes called “unit” organ as opposed to church organ, which is known as “straight” organ). Rather than being an individual instrument, a cinema organ is more of a set of musical instruments controlled with a horseshoe-shaped keyboard console. Invented by Robert Hope-Jones, its secret was electro-pneumatic system, that was used to activate its ranks of instruments by electric relays and pneumatic air. According to Anderson: “One difference between the two types of organ involved the unit organ’s use of electrical circuitry to reuse part of a rank of pipes instead of adding another rank of pipes of the same size.” (Anderson, 1988, p.29)

This allowed the organist to use different sets of instruments and sound effects that were played by a keyboard. One particularly interesting feature was the organ’s ability to produce various sound effects, as Altman explains: “While previous organs had often featured a single percussion instrument, Hope-Jones introduced an entire toy counter of percussion sounds, and in particular dozens of traditional moving picture sound effects.” (Altman, 2004, p.333)

It also embedded a huge set of other instruments. The American Theatre Organ Society (ATOS) has a web page, which has a lot of information about the theatre organ: “Real musical instruments, not previously associated with the pipe organ, were installed in the pipe chambers to be pneumatically operated at will by the organist. Such instruments as piano, drums, cymbals, xylophone, marimba, orchestra bells, chimes, castanets, woodblock, and even tuned sleigh bells could be played from the organ keyboards. Sound effects such as train and boat whistles, car horns, sirens, bird whistles, and an imitation of ocean surf could be used to great effect at appropriate times during a silent film.” (American Theatre Organ Society, 2012)

In Finland, there is no evidence of cinema organs being installed. (Juva, 1995)

Although the unit organ was often used together with a real orchestra, it also allowed a wide range of sounds to be used by one musician. Conceptually it precedes the role of digital audio; rather than being an individual instrument, it is more of a set of musical instruments, that can be operated individually. ⁶

⁶A free midi version of Theatre Organ – Mitzter™ – can be found and downloaded free at <http://www.virtualorgan.com>

2.3 Decay of silent film

The finesse in the use of live music, played by a large orchestra or mechanical theater organ, came to its abrupt halt when the technique of recording and reproducing sounds was stable enough to be used commonly. The first attempt to successfully record sound directly on film was completed in 1910 with optical system was called Photocinematophone (Cook, 2004).

The invention of a vacuum tube was not as relevant to film sound as it was to all other sound-related fields, e.g. radio, public address, and high-fidelity recording. Actually, it was the same man, Dr. Lee de Forest, who patented the Audion tube in 1907 in order to improve radio reception, who later founded De Forest Phonofilm in 1922. De Forest Phonofilm was a company that produced short sound films. However, this technique wasn't tempting enough for Hollywood producers and it became obsolete. (Cook, 2004)

In 1926 it was technically possible to introduce sound cinema to reluctant film producers. A system called Vitaphone was the first one to provide synchronized musical accompaniments, not yet "talking pictures". It was a "sound-on-disc" system and a huge success. The first film to incorporate spoken dialogue was *The Jazz Singer* in 1927. According to Cook, the dialogue was not intended to be in the film in the first place:

"It was conceived, that is, as a "singing" rather than a "talking" picture, and all dialogue was to be provided by interpolated titles (intertitles). But, during the shooting of two musical sequences, Jolson ad-libbed some dialogue on the set, which Warners shrewdly permitted to remain in the finished film." (Cook, 2004, p.210)

This improvised dialogue by the actor Al Jolson might have been the essential death strike to silent film. Since *The Jazz Singer* movies began to talk. Vitaphone gave way to more practical "sound-on-film" based systems like Fox Movietone, which became available some six months after Vitaphone system.

The decay of silent film proceeded rapidly and this was a bad piece of news for the accompanists. In July 1929, Finnish musicians union, Musiikeriliitto, discussed the topic in the union's special journal and was aware of the threat talkies posed for the musicians livelihood (Juva, 1995). According to Anderson, this is what happened in the US: "At the end of 1929, the Loew's Theater chain announced there would be no organists in their theaters in the future", "A few of the major Broadway houses retained their organists to play in case the sound system failed, or between the films, or along with the sound films to boost their volume." and "Between 1928 and 1930, 10,000 musicians, half of all those playing in movie houses, lost their jobs." (Anderson, 1988, p.45)

It is notable how the new technology of sound-on-film recording raised interest among certain people. Primitive musical experiments were made by splicing optical film before the magnetic tape recorders became available (Holmes, 2008).

2.4 New rise of musical accompaniments

As we know now, silent film accompaniments did not vanish completely. Recently, they have gained a new status amongst the cinema loving audience. There are many festivals, film archives, museums, art schools, concert halls, to mention but a few, which organize silent film screenings with musical accompaniments. The role of musical accompaniment has altered since its heyday a hundred years ago. In many film festivals, silent film accompaniment in the program is often given a role of a ceremonious event, where audience can experience cinema in its original form. Films can be accompanied using the original score, often played traditionally by a big orchestra or a pianist. A new accompaniment might have been made, perhaps actualized by means of experimental instrumentation or digital audio processing techniques. Yet another often used technique is improvisation.

One of my strongest movie experiences took place in Midnight Sun Film Festival, in Sodankylä where I saw a cinema concert of Charlie Chaplin's *The Gold Rush*. It was accompanied by Oulu Symphony Orchestra and conducted by Timothy Brock. *The Gold Rush* was released in 1925 as a silent film. After the inception of mechanized sound, Chaplin re-released it as a sound film in 1942. He had added the spoken narration and composed a new score for it. Brock used the score Chaplin had composed for the 1942 sound version but he had rearranged it to fit the original 1925 silent version. The music, interlocked with the movie, was breath-taking in its preciseness and multiplicity - and the end result absolutely hilarious!

The popularity of silent film accompaniments has also taken new forms. According to Cooke: "Such is the renewed popularity of silent-film screenings with live musical accompaniment that other media, such as television documentary, have in recent years been adapted for this purpose. Extracts from British composer George Fenton's substantial orchestral score to the monumental BBC TV series about the oceans, *The Blue Planet*, have been performed live in several countries, commencing with a show in London's Hyde Park in 2002 in which Fenton conducted a live accompaniment to a large-screen projection of the stunning wildlife photography from the series." (Cooke, 2008)

In the book *Early Cinema Today* (2011), edited by Martin Loiperdinger, a selection of exhibitors, specialized in reconstructing early cinema screenings consisting of short films, write about the art of programming and live performance. Loiperdinger discusses the customs and the venues of screenings: "While almost all live performances of early cinema today which are known to us neglect the historical institution of the film lecturer and instead are satisfied with the musical accompaniment by a piano player or a small orchestra, it is impossible to perform a fairground film show without barkers and film lecturers. Both are absolutely required by the fairground *dispositif* which fundamentally differs from all parameters of film screenings in the environment of film archives and cinema museums." (Loiperdinger, 2011)

In my opinion, a cinema concert can be not only great entertainment, but also educational for people who have grown up in the mediatized culture and have experienced cinema mostly in

multiplex theaters. A cinema concert is a good example of the importance of music in cinema storytelling, gives the audience a historical perspective, and perhaps increases the viewers respect towards the art of cinema.

Personally, as a musician, I have found it fascinating to be involved in composing new scores for old movies thus bringing them back to present. Even if the musical score is the original one — dating back possibly one hundred years — the live music makes the viewing experience very concrete and up to date. The fact that the sound one hears is created in the very same room you're sitting in is very strong psychoacoustic factor. This is something a recorded soundtrack simply cannot provide.

3 Customized Musical Instruments and Sound Systems

"I had become a virtuoso on the soldering iron before becoming a virtuoso on the instrument."

- Oskar Sala (who further developed Trautonium, an early electronic instrument)

In this chapter I explain the aesthetics and realization of Cleaning Women sounds and see what kind of similar experiments have been made in the field of experimental sound art. I talk about my history with Cleaning Women and explain how we ended up making music for silent films. Experimenting with self-made instruments and sound systems have taught me a lot about sound processing and performance techniques. Therefore, in order to understand the basis of the *I-files* accompaniment, I feel it is necessary I explain my background to the reader. I have been a member of Cleaning Women since the spring of 1999, which totals exactly 14 years of playing self-customized instruments as I am writing this. During that time I have composed music, written lyrics, played, sang, and created new sounds for the instruments in my setup. However, my background in music is related to experimental rock music. Alongside with Cleaning Women, my other long-term musical project has been an alternative rock trio called Kometa, in which I play the guitar and sing and compose most of the material. Kometa operates with traditional instruments. My point of view towards making music has always been the one of a musician's and a song-maker's instead of e.g. an instrument builder's.

The credit for the design and construction of the Cleaning Women instruments goes to Risto Puurunen, whose brainchild the concept of Cleaning Women is. Timo Kinnunen has to be credited too, since he also has been highly involved in the construction of the gear, especially building the percussion instruments.

3.1 Beginning

Cinema came closer to music in my life, after I got in to study audiovisual media production in Helsinki Polytechnic in 1998. I ended up sharing an apartment with Risto Puurunen and Anu Keränen, the two founding members of Cleaning Women, an avant-garde art school group which had a small following in the local art community. The third member and co-founder was Timo Kinnunen, a good friend and a band-mate of mine in Kometa since upper comprehensive school. During the first year of my studies, Cleaning Women were preparing for an extravaganza; a gig played inside a giant custom-made washing machine called the Hyper Cleaner. Anu could not participate due to her decision to concentrate full-time on her studies, and I was asked to fill in for her. This changeover turned out to be permanent, and ever since the gig inside a giant washing machine I have been a member of the band, to date playing over 400 gigs in over 20 countries. ⁷

⁷For more information see www.cleaningwomen.com

In 2002 Cleaning Women was asked to compose music for Dziga Vertov's *Enthusiasm* (which is originally a sound film!) to be screened in an underground film festival in St. Petersburg. After some pondering and discussion between us and the organizers, which was done with the help of a middleman, we decided to compose a score. Couple of hours before the screening in St. Petersburg, we wanted to check that the version of the film copy was the same we had made the music to. To our astonishment, we were told by the organizers that they did not have the film. It turned out that they never had gotten the information that we actually had agreed to compose the score. They did not have the screening copy of the film at their disposal so we decided to play a normal club set instead, taking this as an educational lesson about the importance of pre-production.

Since that time there has been more success in making music for films. Along the way we have had the opportunity to accompany, among others, such classic films in such places as Sergei Eisenstein's *Battleship Potemkin* in Muzei Kino in Moscow, Jakov Protazanov's *Aelita - Queen of Mars* in Luxembourg Philharmonie, Fritz Lang's *Metropolis*⁸ on a tour in Moscow, Petrozavodsk and Arkhangelsk and of course George Méliès's *A Trip to the Moon*, which was premiered in Espoo Ciné and was later screened at the Tromsø International Film Festival.

3.2 This is the sound of Cleaning Women

The foundation of the sound of Cleaning Women is built on one particular instrument, a customized laundry rack (See 3.3.1 on page 17). The idea of affixing a microphone onto a laundry rack was made by Risto Puurunen in 1996. Before he invented the use of a laundry rack as a musical instrument, he had (together with Timo Kinnunen) been experimenting with a contact microphone and a ZOOM 9002 multi-effect, which was famous for being the first stompbox-sized digital multi-effect processor (released in 1989). However, it was laundry rack that inspired him to form a group, based around the idea of contact-miked household items. Of course, the idea of using contact mics in search of new sounds is not a new one and can be dated back almost a hundred years, all the way to the 1920s. According to Holmes:

“...some early electrified pianos used contact pickups that were fastened directly to a piano's soundboard. The *Radiano* (Frank Adsit, 1926) comprised a set of pickups that could be attached to any piano. It amplified the sound of the piano through the microphone input of a conventional radio set. The next generation of electrified pianos used proximity pickups and eliminated the soundboard entirely, providing a sound that was distinctively different from an acoustic piano.” (Holmes, 2008, p.29)

⁸Together with Nasra Ali Omar and Gudmund Rotevatn Østgård from Tromsø, Norway and Ivan Afanasyev from Petrozavodsk, Russia

John Cage, an influential sound artist, has also been an innovator in the use of self-made instruments and contact microphones. According to Collins: “At the beginning of his career he literally made do with rubbish: his early percussion music, such as “First Construction in Metal” (1939), used brake drums and other scrap iron from junkyards.” (Collins, 2006) In one of the earliest pieces of live electronic music, Cage’s Cartridge Music (1960), he used contact microphones and cartridges to amplify small sounds.

Hugh Davies was another early artist experimenting with contact mics: “Davies began inventing piezo-amplified instruments in the 1970s, the most poetic of which consists of a disk with short steel wires soldered around its rim. By plucking or blowing gently at these wires, he could elicit a wide range of surprisingly deep, marimba-like sounds, which he incorporated into composed and improvised work.” (Collins, 2006)

Einstürzende Neubauten, a German pioneer of industrial music since 1980 is famous for using junk metal, power tools and other ferocious self-built instruments. The group has also explored contact mics, as the group’s bass player Alexander Hacke explains in a web interview: “So much of our work is researching materials and how to mic or pick up the sounds. With a contact mic, you can dive into the depth of these objects. It’s what you hear when you hold a resonating object to your ear; it’s a completely different way of recording than with a regular microphone. The contact mic really started our business.” (Macdonald, 2010)

I would like to emphasize, that I am not a musical instrument maker. Instead I try to create new sounds, compose, develop performance techniques, and make the output musically interesting. However, since I have been observing the building process closely, sometimes taking part myself, I consider myself competent to write something about it. The main formula of creating new Cleaning Women instruments follow mostly these steps (not necessarily in this particular order):

1. Building, finding or salvaging an object that has a characteristic sound (usually based on a need to create a specific sound or set of sounds, based on envisioned characteristics of the sound). The object can be something really simple, like a fermentation vat to be used as a kick drum, or something extremely complicated, like a customized bass laundry rack (See 3.3.1), which took countless hours to build, test and finalize.
2. Placing a microphone onto the object’s body if it’s hollow, or near the sound source (e.g. strings), based on the features of the sound source.
3. Channeling the signal into an effect unit or units, creating one or multiple sounds with the unit, or sometimes ignoring the effects completely, using only the clear signal.
4. Creating a playing and performance technique (hitting with a stick, playing with a bow, using bare hands, using a plectrum etc.)

The use of effect pedals, either digital or analog, has been essential in the development of the sound of Cleaning Women. Digital multi-effects have colored the sound since the beginning. However, they are not used in everything. The characteristic sound of Cleaning Women is based on acoustically produced sounds that are picked up with microphones, then possibly effected, and then amplified.

The evolution of Cleaning Women’s instrument family has been sprawling widely. In the first years the instrumentation was built around three customized laundry racks and effects unit. Since then, the instrument family has grown hugely. Today all three members have a unique set of personal instruments, including contraptions like “coffee bean can bouzouki”, “scrap metal cello”, and percussive “fermentation vat” that is used as a kick drum, and “washing machine drive pulleys” that are used in the same way as cymbals in a trap set. My sound system consists of “customized laundry rack”, “clothes hanger rod bass”, “customized bass laundry rack” and lately also “electrified hammered dulcimer” that has been an addition in the instrument family in the latest movie accompaniments. I have also a variety of effect pedals that are essential to the sound output.



Figure 1: Cleaning robot CW04 playing a customized laundry rack. Photo by Temuri Hvingija

3.3 Examples of self-customized instruments

Before industrialization, practically every instrument was hand-made. Tens of thousands of years ago the first instruments were carved out of animal bones, and since then humans have been building

musical instruments by themselves. The aesthetics of making art by building customized self-made instruments started to emerge at the beginning of the 20th century along with industrialization and electricity. Electricity also made possible Thaddeus Cahill's Telharmonium, the first synthesizer ever built. It was a huge and complex instrument weighing about 200 tons, and an ambitious attempt towards unheard self-made sounds (Holmes, 2008). The *Art of Noises* manifesto (1913) by Luigi Russolo was pivotal in the aesthetics of sound art and in order to incorporate real-life sounds into musical performances Russolo even built mechanical instruments – known as *Intonarumori* (noise intoners) – for creating different kind of noises in concerts (Gibbs, 2007). These days various techniques are used in order to coax interesting sound material. In circuit bending customized sounds are created by altering the circuits of electronic devices. Similar DIY attitude can be found among hardware hackers, who build and alter hardware using electronics and microcontrollers.

In the following subsection two Cleaning Women instruments are introduced to explicate different techniques that can be used in making and playing self-customized instruments and sound systems. The instruments can be roughly categorized in two groups based on their complexity. They can be either quite simple, basically any object with an attached microphone (the original contact-miked laundry rack) or then very complicated structure of mechanisms, electrics and materials (the bass laundry rack).

3.3.1 Customized laundry rack

The origin of this musical instrument is a common household item; a laundry drying rack with two fold-out wings (known also as clothes horse or drying rack). The most visible modification is that the original rods have been replaced by threaded rods. Rods are placed through matching holes that have been drilled into the frame. Each threaded rod is shortened into specified length in order to produce a certain pitch. Each rod is attached into the frame with 4 matching nuts, two nuts on each side. The rod is tuned by trial and error, first playing the rod with a bow to get a continuing flat pitch and then checking the pitch with a tuner. If the pitch is incorrect, the nuts are loosened. The rod is carefully moved either inwards or outwards in the frame to get the desired pitch and the nuts are tightened. This procedure is repeated until the pitch is correct. The frame of the laundry rack is miked with one guitar pickup mic that is mounted inside an aluminum cover to prevent humming and other unwanted noises. The microphone cover is attached to the rack's frame with a cable tie. The signal from the pickup microphone is routed into two ancient ZOOM guitar effects processors (both, models 3030 and GFX-5, have been out of production for years). From the effects pedals the signal goes in stereo into two DI-boxes. In live set, I often use the clear sound without any effects.

It's notable that a contact mic is not being used anymore. In the past, many experiments have been done with different types of contact microphones. One long-term solution was to use two or

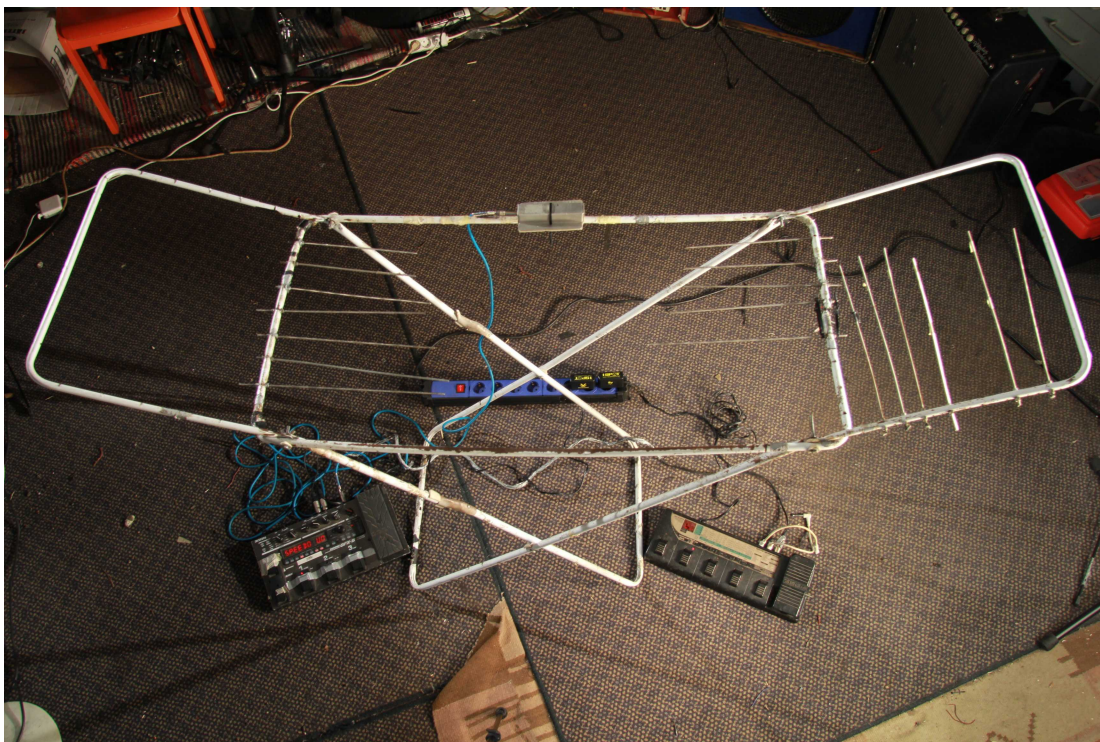


Figure 2: Laundry rack pictured above

more battery-powered electret condenser contact microphones attached with plasticine or blu-tack. This system was very cumbersome, and hard to control in live situations because of the feedback. Another solution was a circular piezoelectric microphone. The problem with a piezo mic was that it is very difficult to attach properly into the round frame of the laundry rack. If the mic is too loose, it does not pick up the vibration of the frame and threaded rods properly, if it is too tight, it bends and breaks up. An undersaddle piezo mic was also tested, but it also was difficult to affix properly and the sound was not satisfactory. All problems were solved with an electromagnetic pickup microphone. Because the laundry rack's vibrating frame is metallic, a pickup microphone can capture the mechanical vibrations directly from the frame. It doesn't feed back easily, is easy to attach, is robust and the sound is rich and full-bodied.

The customized laundry rack is quite a unique instrument in itself, but of course it has predecessors in the global instrument family. Its playing technique reminds of a hammered dulcimer. Like a hammered dulcimer, a customized laundry rack is also played with mallets (chopsticks in this case) and the playing technique and placement of the rods is similar to hammered dulcimer's strings. According to Hornbostel-Sachs musical instrument classification it belongs to the family of Idiophones. Idiophone is an instrument that vibrates itself without using strings or membranes

to produce sounds, as e.g. African thumb piano called the kalimba. But as the kalimba is plucked with the fingers, a customized laundry rack is usually played with a pair of chopsticks. According to *Musical Instruments of the World* (1976): “Although similar in general appearance to the xylophone, the metallophone has bars made of metal instead of wood”. Based on this classification a laundry rack as a musical instrument is a metallophone. Notable is that when played with a bow it can be classified in the subclass “friction instrument” and when they are played with a chopstick being scraped against threaded rods - the technique I use occasionally - it can be classified in the subclass “scraped instrument”.

3.3.2 Customized bass laundry rack

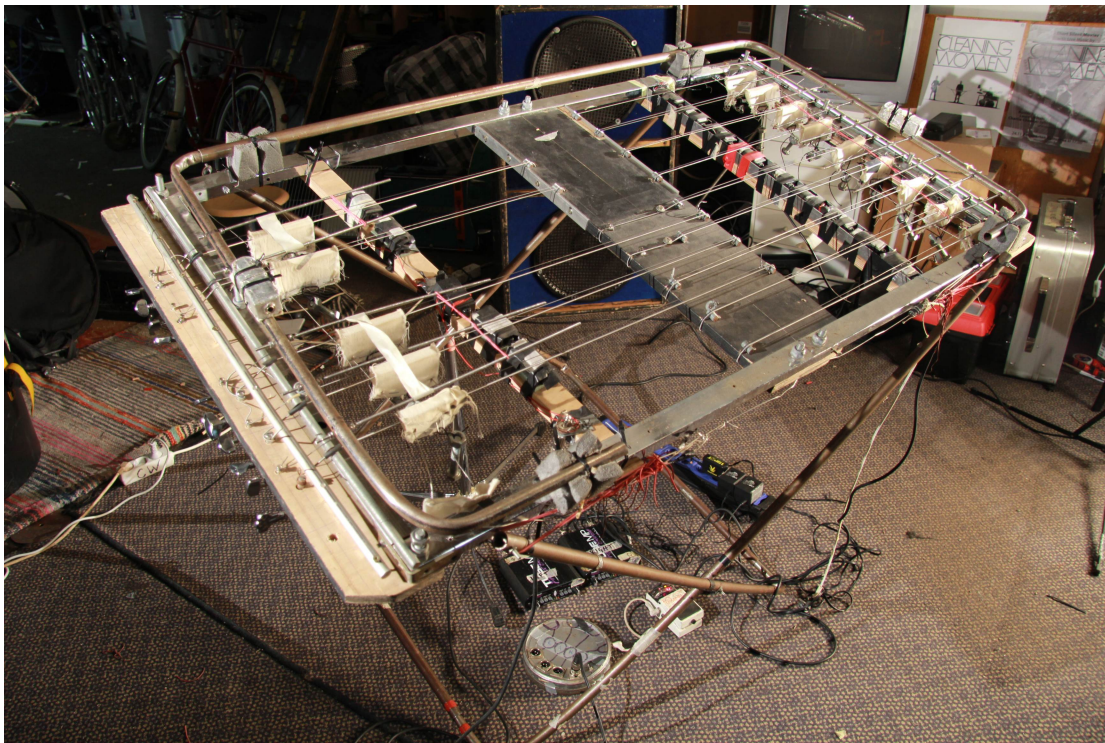


Figure 3: Customized bass laundry rack

Customized bass laundry rack is the most complicated in the Cleaning Women instrument family. It consists of a thick metal frame into which 13 pairs of strings have been attached. There are two strings for each tone that are tuned one octave apart. A bass guitar string is used for the lower pitch and a piano wire or a guitar string for the higher pitch. The lowest note it can produce is E1 (equal to electric bass guitar) and highest note is F2. It has a range of one octave plus a

semitone. The strings are placed horizontally (viewed from the player's point of view). Each pair of strings is dampened with a piece of cloth that rests on top of the strings. It is important that the piece of cloth is placed on the string for long enough distance to prevent the unwanted harmonics to be heard. These dampeners are connected by wire into a sustain pedal, that can release the dampeners if needed. The technique is similar to piano's sustain pedal. The sustain system has not been used lately and the pedal is not shown in Figure 3.

The string pairs are divided into two segments following the logic of a piano keyboard. The "white keys" are on the right side and the "black keys" on the left side. For each pair of strings there is one electromagnetic bass guitar pickup microphone. The microphones in each segment are connected together in series forming two groups. The other group ("black keys") consists of 5 mics and the other ("white keys") of 9 mics. Both of these segments are routed individually into separate pre-amps, out of which the sound is united with a jack Y-cable. Because the string is played with a stick, the sound has very fast attack. It decays rapidly because of the dampeners. The end result is sharp tone with a warm low-end, and due to a piano wire it has bright harmonics, reminding a bit of a hard-plucked bass guitar. The instrument is very suitable to produce groovy bass lines with rapid spurts of accents.

4 A Trip to the Moon

In this chapter I explain how the music was composed for the movie *A Trip to the Moon* by Georges Méliès. The reason I use this particular movie in my thesis as an example of making live music for moving images is because the structure of the movie is simple, and the movie is relatively short. Therefore I find it especially suitable for analysis within the framework of this thesis. I examine the process of composing music for moving images; how to begin to work with the score, how to fit the music with the imagery and what has to be taken into consideration. In the end of this chapter I talk about the performance techniques of playing live music for silent films.

A Trip to the Moon is a magnificent film and a relevant part of film history. George Méliès was one of the first to adapt the techniques of “living pictures” and one of the first, who began to develop the medium (Cook, 2004). As it is often case when combining technology with art, a coincidence played an important role in Méliès’s creation process. As Cook explains:

“According to Méliès’s memoirs, one afternoon in the fall of 1896, while he was filming a Parisian street scene, his camera jammed in the process of recording an omnibus as it emerged from a tunnel. When he got the machine working again, a funeral hearse had replaced the omnibus, so that in projection the omnibus seemed to change into the hearse.” (Cook, 2004, p.14)

This kind of trick, where an object is changed into something else in between two frames, is used often in *A Trip to the Moon* as in other Méliès’s films. His movies - and probably many others - would have been a lot different if he had not had this serendipitous accident back in 1896.

A Trip to the Moon is from 1902, so its story-telling is still on very primitive level. The events of the story are linear and they seem to be happening in real-time. As in every movie Méliès ever did, the camera is fix in every scene and every image is full shot. There are no cuts used within any scene. However, it is a movie with a story and characters. The action takes place in different locations and the characters go through a variety of emotions and actions. It has its protagonists and antagonists. The music can be used effectively to emphasize ambiences, action, story-telling, structure and to set the overall mood for the movie. The version we made music to, is the hand-colored and fully restored version, which was premiered in 2011.

I am writing this chapter as a member of Cleaning Women and everything that I write in this chapter relates to the techniques we use within the group, unless otherwise noted.

4.1 Composing the music

In the golden era of silent film in the US, an impresario Samuel “Roxy” Rathafel was one of the first exhibitors to realize the potential of a good accompaniment. He was a competent showman

and had a talent regarding musical accompaniments. I find his idea for a musical accompaniment very usable also in modern composer's point of view:

"All exhibitors consciously or unconsciously aim at realizing the producer's ideals. . . . These thoughts and ideas are frozen on the film; they are not flexible or plastic. The best then that we can do is to interpret what the director intended to convey, to emphasize and amplify his meaning. I try to read the mind not only of the director, but of the scenario writer as well, and I follow the actors very closely. Only in this way is it possible to do full justice to the combined efforts of the men in studio." (Altman, 2004, p.275)

When making music for moving pictures we try to be very careful to not overshadow the director's intentions with music. On the other hand, we want to leave our own imprint on the movie by the accompaniment. The hard part is to foist our own interpretation of the film in a way that does not conflict the film makers' artistic intentions. *A Trip to the Moon* is a fantasy film, a spectacle of its time. But when watching it today, it appears undeniably comic in many ways. The acting is exaggerated and even our knowledge of the universe has changed so much that the film's astronomical facts appear outdated like in the scene, where the expedition returns back to Earth by simply falling over the edge of the Moon.

Our version of the music aims to underline the spectacularity and the suspense in the film instead of making an old-fashioned accompaniment pastiche of the music. It is important to jump into the author's shoes and keep in mind the film's historical aspect, instead of e.g. focusing on the accidental comical aspects. A question I often ask myself while making music for old films – even though impossible to answer – is what would the director want musically if he was making the same movie with modern audio and music technology?

The process of composing the music starts often with improvisation. I believe it is a good method, because it does not close any doors in the beginning of the process and it can open your ears and eyes to something unexpected. You are not yet stuck with a vision. It has to be remembered that when composing music for a live accompaniment, the music must cover the whole duration of the film so it is important to create enough material to work with. Another very important aspect of film music is the mood. It can either be a sound, or a melody, or soundscape, but it has to be something that either supports or contradicts the action of the film. How is the right mood for a music written for a film recognized, then? This is a matter I find impossible to explain, even though it is relevant in the creative process. To put it banally; it is something that communicates with the film on some level and – feels right. After enough material has been produced and recorded, it is time to start putting the pieces on their right places.

In the case of *A Trip to the Moon*, I remember that the score was created quite effortlessly. It was a mixture of new music that was partly composed beforehand, and new material that we

composed specifically for this film. The tonality of our instruments and the characteristics of our music seemed to easily find their place in the imagery.

4.2 The structure of the movie

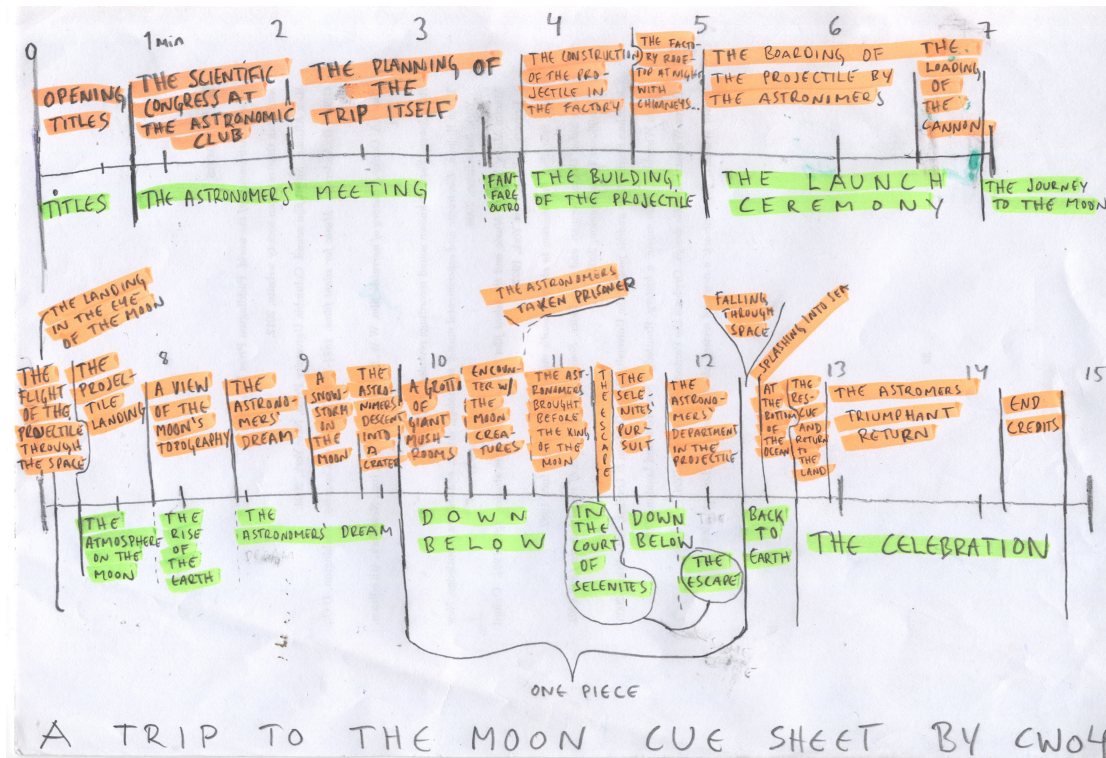


Figure 4: The timeline of *A Trip to the Moon* (in orange) combined with cues for musical themes (in green).

In the Book *A History of Narrative Film*, Cook (2004) has arranged the scenes from *A Trip to the Moon* into precise chronological sequence. The movie is divided into 30 scenes. However, in the version we worked with, there were additional opening titles and end credits that I have added to the list:

[Opening titles]

1. The scientific congress at the Astronomic Club.
2. The planning of the trip itself.
3. The construction of the projectile in the factory.
4. The factory rooftop at night, with chimneys belching smoke in the background.
5. The boarding of the projectile by the astronomers.

6. The loading of the cannon.
 7. The firing of the cannon.
 8. The flight of the projectile through the space.
 9. The landing in the eye of the moon.
 10. The projectile landing, moonside, and the astronomers disembarking.
 11. A view of the moon's topography.
 12. The astronomers' dream (visions of the Pleiades and Zodiac signs).
 13. A snowstorm on the moon.
 14. The astronomers' descent into a crater.
 15. A grotto of giant mushrooms in the interior of the room.
 16. Encounter with the moon creatures, or Selenites.
 17. The astronomers taken prisoner.
 18. The astronomers brought before the King of the Moon and his Selenite army.
 19. The astronomers' escape.
 20. The Selenites' pursuit.
 21. The astronomers' department in the projectile.
 22. The projectile falling vertically through space.
 23. The projectile splashing into the sea.
 24. The projectile at the bottom of the ocean.
 25. The rescue and return to land.
 26. The astronomers' triumphant return.
 27. The decoration of the heroes.
 28. Procession of "Marines".
 29. The erection of the commemorative statue.
 30. Public rejoicing.
- [End credits] (Cook, 2004)

In Figure 4 the structure of the movie can be seen in relation to the music. This particular cue sheet was not used in the performance, but it has the typical appearance of a cue sheet that is often used by Cleaning Women.

4.3 Themes

The soundtrack consists of 7-8 different pieces of music or themes, all of which are based on the action and imagery of the film. I explain the motives behind the decision in using each theme. I must emphasize that the depiction of the music is subjective and is not based on music theory. To hear the accompaniment in it's entirety, one must see and listen to it from the attached DVD. These

written descriptions are not meant to be a written score, rather to help the reader to interrelate sounds, musical instruments, performance techniques and images.

4.3.1 Opening titles

The titles are not in the original version of the film. In the new restored and colored version the titles are added to explain the restoration process. Therefore these texts are relatively long. The title music is performed using an electric drill. The drill's motor causes electromagnetic interference which a pickup microphone transforms into audible sounds. This sound is also effected using delay. The sound's pitch and duration can be controlled, albeit the pitch is quite hard to control precisely. The sound is "extra-terrestrial", resembling the likes of a Theremin or synthesized sounds, that are commonly used in old science-fiction films. The eerie sounds, created with a drill, are used to set the mood for the movie.

4.3.2 The astronomers' meeting + fanfare outro

The first scene begins with the electric hammered dulcimer, that plays arpeggios using two chords. This instrument is similar to hammered dulcimer, but it only has one string for each tone. Piano wires are used as strings and for each string there is a electromagnetic guitar pickup microphone. It also has a sustain pedal that releases the strings that are dampened with a thin cord. The sound resembles a piano or a cembalo and for this scene it is chosen to fit the noble action of the characters. I would even dare to say, that the music begins in the fashion of a traditional silent film accompaniment. However, quite soon the bass laundry rack is brought in together with the metal rods of a laundry rack. This adds rhythm, intensity, and harmony to the music according to the picture. The characteristics of the soundscape begins to build up. I like to call the general soundscape in this accompaniment "retro-futuristic". This is because the sounds created with effected acoustic instruments – that have a specific sonic characteristics – resemble sounds that are typical for analogue synthesizers, i.e. sound "retro". But since the instruments are self-built, and they are colored with not-state-of-the-art digital effects, the sounds become "retro-futuristic".

In the half-way of the scene a coffee bean can bouzouki is brought in, heavily effected. The bouzouki plays long notes and simple melodic lines, the sound resembles a bit of Moog synthesizer. This instrumentation goes on until almost the end of the scene.

When the astronomers are finally ready to leave after all the planning, the music changes into a fanfare-like theme, played with an electric hammered dulcimer and some percussion. This fanfare was not included in the first screening. We decided to add it in between two screenings in Tromsø Silent Film Days. This was because the first scene is very long to go through with one piece of music and we wanted to put something extra in the end of the scene. This fanfare piece of music was originally written to be used in the opening scene of Laurel and Hardy's short film *Liberty*.

We were working with both of these films at the same time. It is typical for us to update the accompaniments and interchange material within our own repertoire.

4.3.3 The building of the projectile

The scene starts with a riff played with the bass laundry rack. It consists of two atonal patters that are repeated. The repetitive pattern resembles a machine in a factory or workers on an assembly line. It goes along with the imagery of the workers building the projectile. Percussive hits are added increasingly, which develop into a constant – albeit varied – beat. This theme covers also the next scene, where the astronomers are observing the construction from the factory’s rooftop.

4.3.4 The launch ceremony

This theme is also fanfare-like. It is based on simple rhythmic pattern and only five tones, resembling of march music in order to fit the festivity shown in the picture. It is played with bass laundry rack and its metal rods, percussion, and scrap metal cello. It also covers two scenes; The boarding of the projectile by the astronomers and the loading of the cannon. The intensity increases towards the last scene. It was important to play this piece of music in the right tempo in order to play the last hit simultaneously with the loading of the cannon.

4.3.5 The journey to the moon / the rise of Earth / the astronomers’ dream

The musical fundament on the journey to the moon and the forthcoming scene is the same “theme” that is used in the titles, a soundscape made with an electric drill. But there is also a constant tone actualized with digital voice effects processor. It is a short snippet of the drummer’s live vocal performance that is automatically created into a seamless steady loop. It evokes a haunting atmosphere. It is used to set a completely different atmosphere than that of the Earth’s. This is an important scene because finally the trip to the Moon begins and the astronomers leave Earth. The journey to the Moon scene is relatively short and includes the famous shot where the projectile pokes the moon in the eye. That event is accented with electric hammered dulcimer making a fast glissando with the sustain pedal depressed. The right timing was very difficult to achieve since there is no preceding clue about when the projectile is going to hit the moon. The foundation of this theme, which is basically just one note, continues to the next scene where the projectile is shown to land on the Moon.

When the astronomers see the rise of Earth, a melody is brought in with a scrap metal cello. This melody represents Earth, or rather the characters’ feelings towards Earth when they see it from the surface of the Moon. Right before the earth disappears from the screen, an explosion happens. This is accented with an effected hit played with a laundry rack. Similar explosions, that

will be seen many more later when the Selenites explode, are clearly diegetic music, i.e. music (or a sound effect in this case) that is coming from within the scene instead of being an accompaniment outside the movie. When the astronomers see a shooting star it is accented again with an electric hammered dulcimer.

A new melodic line is brought in when the astronomers go to sleep. This mysterious melody is played with a scrap metal cello in 7/4 time signature later joined by the electric hammered dulcimer. It is the astronomers' dream and meant to increase mysteriousness on the moon even more.

4.3.6 Down below

This theme is basically a song consisting of two parts. Part A is rhythmic action music and part B is more dramatic in order to create suspense. The changes between the parts is arranged in the fashion that it fits the action and the varying scenes on the screen. This music is being played from the moment the astronomers descent under the Moon's surface and it continues until the projectile drops back to Earth. This is also the section of the movie, where a lot of fighting, chasing and running happens. Therefore a constant piece of action music is used to convey the story.

4.3.7 Back to Earth

This is a small interlude played with an electric hammered dulcimer (when the projectile falls back to Earth), changing into an effected laundry rack (when the projectile sinks and swims under water). The interlude is important because the previous and the forthcoming music is intense and even quite loud to some extent. A decrease in dynamics in between scenes gives the audience a small pause and it also effectively leads into the final scene. The quiet interlude together with the action on the screen is a hint for the audience; the story is almost told and the end of the film is near.

4.3.8 The celebration

The celebration is a rhythmic and danceable song, with steady beat coming from the kick drum (which is actually a plastic fermentation vat). The song is used in the fashion of music for the end credits, even though the movie is not over yet. Anyhow, after the trip to the moon, the end celebration seems to be a bit disconnect from the story, and it lasts relatively long. Therefore we covered the end of of the movie with one single song. This music goes on until the last scene and the end titles are finished.

4.4 Arranging the music

In James Wierzbicki's book *Film Sound* is an example of how music was arranged to the film and how the cue sheet was made. Wierzbicki (2009, p.66) quotes an article from Literary Digest,

published in January 26, 1918. The article is called “How Music Is Made to Fit the Film,”. The methods of arranging can still be quite the same. In the following segment I compare the praxes I have found useable, to the ones that have been used in 1918. I also point out the differences that have altered the process due to technological progress.

“When a new film is booked for an engagement the print to be used is sent on a week ahead for a private screening. This may occur in a private projection room, in the theater proper before the performance time, or in the studio of some film exchange. In any instance, it is at the private screening [that] the work of the musical director begins. It is there he lays the foundation for his next week’s score. The picture is projected at the same speed at which it will be shown to the public. As the scenes flash across the screen, the director jots down his notes as to varying incidents and characters. Three or four of the leading characters are selected as vital to the action. Varying themes may be given to them, . . . or the basic principle of the play may be themed. . . .” (Wierzbicki, 2009, p.66)

The first screening is important. The first screening sets the overall mood for the composer to continue the work on. Of course nowadays it is easy to see the movie various times on DVD or possibly on YouTube instead of arranging a private screening of the film, but in general it is good to write down the ideas you get while watching the film for the first time. In my experience, it is common that during the first screening the ideas for the themes for the leading characters appear. It is also important to check that the copy you are working with is shown at the same speed in the performance to avoid asynchrony in the music.

“Elaborate notes are made as to the varying scenes, with memoranda whether the action is fast or deliberate, long or short, and what character participates in them. This is the working model, as it were, the skeleton upon which the director fastens his themes and builds up a musical composition to fit the performance.” (Wierzbicki, 2009, p.66)

This phase is usually the first one to begin with in the rehearsal place. In our case, it is usually a drawn timeline where the scenes have been separated into segments and specific notes have been made, e.g. first appearance of characters, special sound sources in the picture, comments on the action etc.

“Then comes the real task—the arranging of the score.

The average feature of the program presented today runs from five to ten reels, with an average of 1,000 feet of film to a reel. The six- and seven-reel feature is employed as frequently as any. The total of musical numbers selected in making up the score for such an offering may number from eighty to one hundred different compositions, irrespective of repetitions; the number is never less than from forty to fifty.” (Wierzbicki, 2009, p.66)

In our case this is the phase when we do the actual composing of the music. Our method is to improvise themes and to record them. Sometimes old material is chosen to accompany the movie if it is found suitable for the movie. When we have enough recorded material, we start to listen to it. The good thing in recording, as a composer and a musician, is that when you are listening to the recorded material you can more easily listen to it objectively. Listening to recorded music makes the choosing easier. It is a good method to run the movie, put some of your music on and observe how the music communicates with the picture. If the music does not work it is easy to try some other theme or piece of music. In this way, the improved technology has made arranging a lot more easier and faster.

When these arrangements are completed, the music selected, the themes worked out, the cuttings indicated, and the rough version of the setting is ready, then comes the second showing of the film, which is reviewed by the director and the pianist. Then. . . the music is made to fit. Some bits may be found to be too long; some may run too briefly; all this is noted, tried, rearranged, and, finally, when the session is ended, the score has been synchronized to a nicety. The musical arrangement is reviewed. The part for each of the various instruments is made to correspond with the master score. Then, when this is done, all is ready for the dress rehearsal, at which not only the orchestra and operators, but stage-hands, electricians, and others may be present.” (Wierzbicki, 2009, p.66)

After compiling the music with the picture we begin to rehearse it live with the movie. In this phase we start to rearrange the music and practice the synchronizing. Sometimes the themes are changed or renewed. Practicing together with the film is an essential part but it is painstaking because the timing is usually hard to match. We do not have specific tempo markings in our notation, therefore it is important to practice enough in order to memorize the tempi correctly. This phase usually involves a lot of rearranging of the music. Practicing begins with small segments, usually in the scale of a scene or two. Small segments are practiced separately. Then they are consolidated into bigger segments until it is time to run through the whole film. For us, this usually happens only a short time prior to the premiere of the screening.

4.5 Performance techniques in live situation

Accompanying a film differs from a normal live performance in many ways. Even though the performer is playing carefully selected and rehearsed material for the audience in a typical manner of a live concert, it still is the mechanical and fixed movie that has the unquestionable star role in a cinema concert. Therefore the music is played as much for the film itself than for the audience. Also, because the audience is concentrated on watching the film, it is possible that any feedback can not be received from the audience while playing. If the performer face the screen it is impossible to have

a visual contact on the audience while playing. In a normal rock club situation, it is typical that the audience interacts with the performer. This does not necessarily happen when accompanying a film. A musician might have to wait for couple of hours, until the end of the film, to get the first long-awaited feedback in the form of applause.

In our case, we usually do not have a written score for the film, but a memo of some sort. If it is a short movie, we usually manage to memorize the movie and the arrangement. If it is a feature film, a written note or a map of some sort is needed, at least to recall the arrangements, and especially how many times each part is played. *A Trip to the Moon* is so short and distinct that a memo is not needed in the performance. When performing in a group eye contact is important. Sometimes it is quite challenging to simultaneously watch the film, concentrate on playing, keep eye contact with your band-mate while preparing for the next cue point. As a musician all this multi-tasking easily affects the intensity of the playing. The result is lame music. It is essential to focus on the intensity of the performance, rather than just robotically carrying out the score.

During the years it has also became clear that one has to be prepared for surprises when performing live music for films. On one occasion we arrived at the movie theatre only to find out that there was no PA system to be used. *Cleaning Women* usually requires a professional PA system with a mixing console of at least 16 channels. Within some hours, we managed to hastily put up our gear and get connected to the movie theater's sound system using the 8-channel mixer of my personal setup as the main console. During one performance the DVD got stuck, leaving us to play improvised music while patiently waiting for the DVD to be stopped and fast forwarded back to the point where the film had been interrupted. In one cinema concert the film caught fire and melted because of an overheating projector, so the projectionist had to skip to the next reel on the fly. Sometimes the reels of a movie have been shown in the wrong order leaving both us and the audience pondering the weird twists in the story line. In one particular case we even had to stop playing and explain to the audience what they did not see because the reels were shown in the wrong order. In all of these situations we have managed to continue and finish the concert. In my opinion – when playing music for films – it is important to be prepared for improvisation and to be able to go with the flow if something unplanned happens. The better you know the score, the easier it is.

5 Soundscape of I-files

In March 2012 I was informed that Mia Mäkelä was looking for a person to compose and actualize music for a live cinema (see 5.0.1) session at the AAVE -festival⁹. During my studies at the Media Lab I had used graphical programming software such as Pure Data ¹⁰ or Max/MSP to process sounds. I had been looking for a possibility to experiment with some of these real-time digital sound processing techniques on stage. A live cinema performance appeared to be a chance to make something I had never before done using techniques I had not used on stage before.

The imagery Mia Mäkelä was going to project was described on her website in the following way: "a flowing stream of images depict Icelandic nature, each frame resemble a living landscape painting in a continuous, viscous perceptive moment." This appeared as a chance to create something "non-linear" in a musical context; hovering soundscapes, eerie melodies and sporadic, experimental sounds.

I was also interested in experiencing live cinema. Compared to traditional cinema, the live cinema concept is interesting, because it usually completely lacks traditional linear storytelling. Non-linearity is also characteristic to digital sound processing techniques. In the book *Sonic Art* (1996) Trevor Wishart discusses the role of computer technology: "Computer technology, offering us the most detailed control of the internal parameters of sounds, not only fulfills the original dream of early electronic music – to be able to sculpt all aspects of sound – but also [...] makes the original categoric distinctions separating music from text-sound and landscape-based art forms invalid. We can no longer draw these lines of division." (Wishart, 1996, p.5) He sees the role of a composer becoming different, as he continues: "In future it might therefore be better if we referred to ourselves as sonic designers or sonic engineers, rather than as composers, as the word 'composer' has come to be strongly associated with the organization of notes on paper." (Wishart, 1996)

5.0.1 Live cinema

Live cinema stands for a real-time audiovisual performance, often created with digital means. The following text is from Mia Mäkelä's thesis paper (Media Lab, Helsinki 2006): "What is live cinema? According to the Transmediale¹¹ press release for it's 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 simultaneous creation of sound and image in real time by sonic and visual artists who collaborate on equal terms and with elaborate concepts [...] The term "Cinema" is now to be understood as embracing all forms of configuring

⁹Alternative AudioVisual Event held in Malmitalo, Helsinki in April 2012

¹⁰:Pd (aka Pure Data) is a real-time graphical programming environment for audio, video, and graphical processing.[...]The core of Pd is written and maintained by Miller Puckette and includes the work of many developers, making the whole package very much a community effort." <http://www.puredata.info>

¹¹A Berlin-based art, culture and technology festival.

moving images, beginning with the animation of painted or synthetic images.”

Like many other art forms, cinema has changed due to digitalization. Interactivity and non-linearity are typical features of digital cinema, as Malcolm Le Grice explains: “Because digital applications in the field of cinema are beginning to have significant commercial potential, two features – interactivity and non-linearity – are becoming widely debated. If there is to be a recognisably new ‘digital cinema’, those two concepts will probably be inseparable in its realisation.” (Grice, 2006)

5.1 Designing the setup

The basic idea was to build a setup that I can effortlessly control by myself and is capable of producing wide variety of sounds. It should be versatile and somewhat musical. I had to be able to interact with Mia Mäkelä’s imagery. An important factor was that in this project I would be performing the music on stage by myself, so I would need to know my system thoroughly in order to avoid disconcerting silence during the performance. I wanted to use Pure Data software in the performance, therefore I had to take my laptop on stage. In my previous live performances I have been reluctant to do so. Probably for that reason I did not want the sound to be dependent on computer only, therefore it was crucial to design a system that includes another sound-generating system. Should the computer crash, I still would be able to continue the session seamlessly. However, I also wanted to make use of my experience from my previous projects, therefore I knew immediately that I did not want to only use a computer, but effect pedals and electro-acoustic instruments too.

I had a meeting with Mia Mäkelä and she told me about the concept of the screening. She was going to project imagery of landscapes, that she would control with Max/MSP/Jitter patch, processing the visuals in real-time. As a reference for what she was going to do, I watched footage of her previous project *Suonombra*, a collaboration between Mia Mäkelä and Zahra Mani, a composer and a musician. In *Suonombra* Mäkelä had used partly the same visual material that she was going to use in *I-files*, together with Mani’s music. She wanted me to realize a soundscape that would fit the imagery, but the final result should be an unique work of art that consists of the output from the two of us.

There was only 2,5 weeks until the performance date, so I had to make quick decisions on how to proceed. Mia would be out of city until the performance date, so it was not possible to practice together.

I had been experimenting with a setup of effect pedals, mixer, radio, and scrap metal percussion on Shinji Kanki’s Experimental Radio Art workshop. Another school-related project was a performance for Andy Best’s workshop Narrative and Storytelling Development in Installation and Participative Performance, where I used a simple setup of a loop pedal and a microphone, with which I compiled layers of sounds made with tiny objects that would fit in a pocket such as a



Figure 5: Performing at experimental radio art workshop. Photo by Shinji Kanki

guitar string, a sharpener, a pin etc. I began to design the setup based on these two experiments. I wanted to put together a diverse sound system, that would be original, easy to control, robust, and hopefully would not crash during the performance.

5.2 Building the setup

How to put envisioned soundscape into practice? How to choose from theoretically endless possibilities of different musical instruments and sound systems? How to decide what kind of processing and performance techniques to use? All these questions became reality when I started to ponder the different aspects of the forthcoming performance.

Eventually I ended up using two different sound systems that I can control separately and overlay and cross-fade if needed. The idea was that I can drive all the original sound signals, that are created live on stage, into either one of these systems. The core of the other sound system consisted of a Pd patch (See 5.2.1) that basically was a multi-channel looper with some qualities I was not able to produce with any other of my effects units, e.g. recording multiple samples and controlling them separately.

The core of the other sound system was a Boss Loop Station RS-20 phrase recorder. I wanted to use a variety of instruments and effects, and still be able to control them. Two independent sound systems would help me to achieve that. With two systems I can create a loop and let it run by itself. In the meantime I can change instrumentation and delete the settings on the other system, and start to build another loop, while the other is still running. With two systems I do not have to produce live sounds all the time. Instead, after creating a satisfying loop I can let it run, and improvise on top of everything.

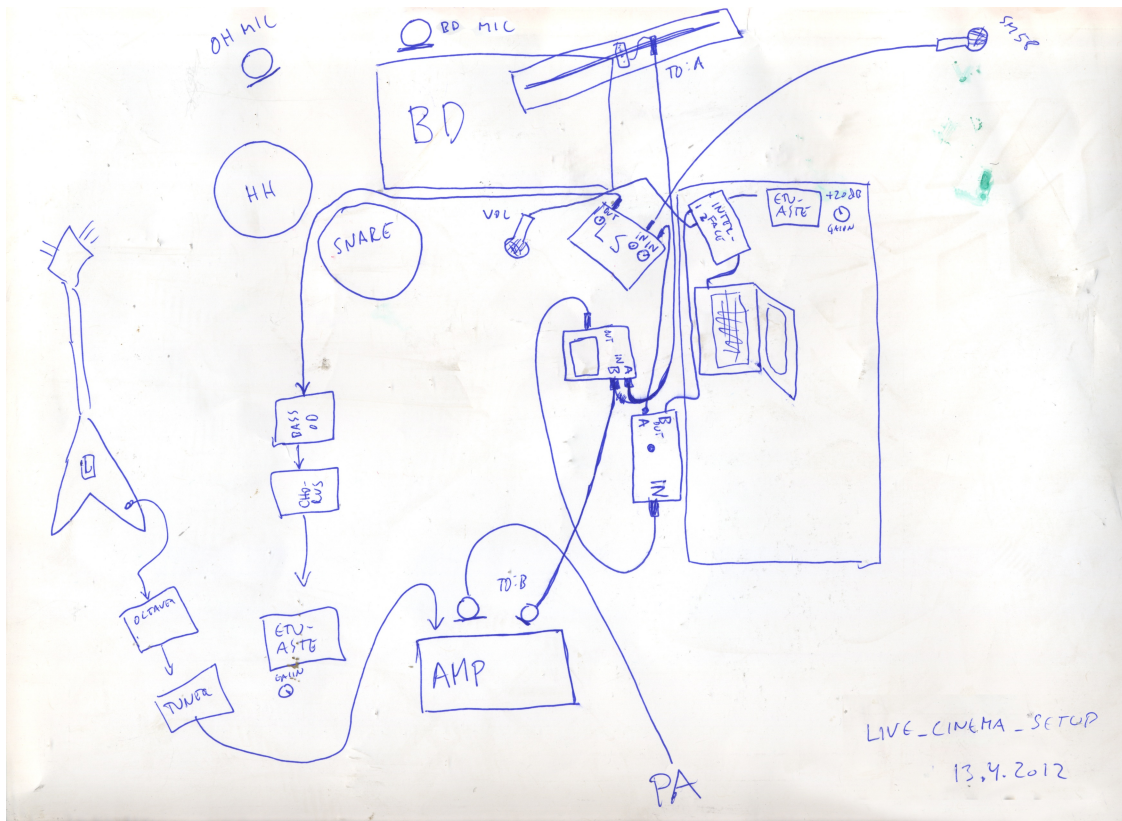


Figure 6: Sketch of the setup

With the help of digital sound processing tools the possibilities in sound manipulation have become almost unlimited. This is part of another kind of problem that can be seen in live situations: performances that are put up using only a computer are often tedious to watch. For a member of audience it is usually difficult or impossible to comprehend the skills of the performer. In my opinion, the artistic quality of the outcome combined with the skills of a performer makes a performance good. I think this is relevant to all kinds of performing arts; theater, circus, a symphony orchestra or a shabby avant-garde poet. If you see a person playing an electric guitar, it is rather easy to notice if the person is talented in what the person is doing. Of course this applies only if the aim of the performer is to show the person's brilliance. The visual aspect is important and it can be used in many ways to enhance a performance, e.g. in a live coding situation, where the screen of the computer is projected onto a backdrop and the audience can follow the process of a person writing the code. In this case the audience can note the coding skills of the performer, even though the performer's physical action might not be very interesting. In the book *Liveness*, Philip Auslander states an interesting point about the concept of a live performance today: "Live

performance now often incorporates mediatization to the degree that the live event itself is a product of media technologies.” (Auslander, 2008, p.25) By this he indicates e.g. to the use of giant video screens that are commonly used in live situation. I believe that carefully considered visuals can add something to a live performance, but the overuse of visuals can also efface the content.

I wanted to achieve the best parts of both worlds; the possibilities in digital sound technology combined with physicality. I would have a computer on stage, allowing me to process the sounds more thoroughly than an effects pedal would do. I chose to have acoustic instruments that I can physically interact with. One decision to bring more live aspect to the performance was that I chose not to use a mixer on stage. Instead I chose to use two stompbox pedals for the signal routing in order to make the channel switching more physical instead of just turning knobs.

One of the hardest part in designing the set-up was the signal paths. I had quite many effect pedals, a sound card, a small amplifier etc., but I had to have control over everything all the time. I also had to be able to channel all the signals into two relatively separate systems, which made the signal path a bit complex. I also had to make sure I can reconnect everything correctly during the sound check prior to performance since there was not much time to rehearse.

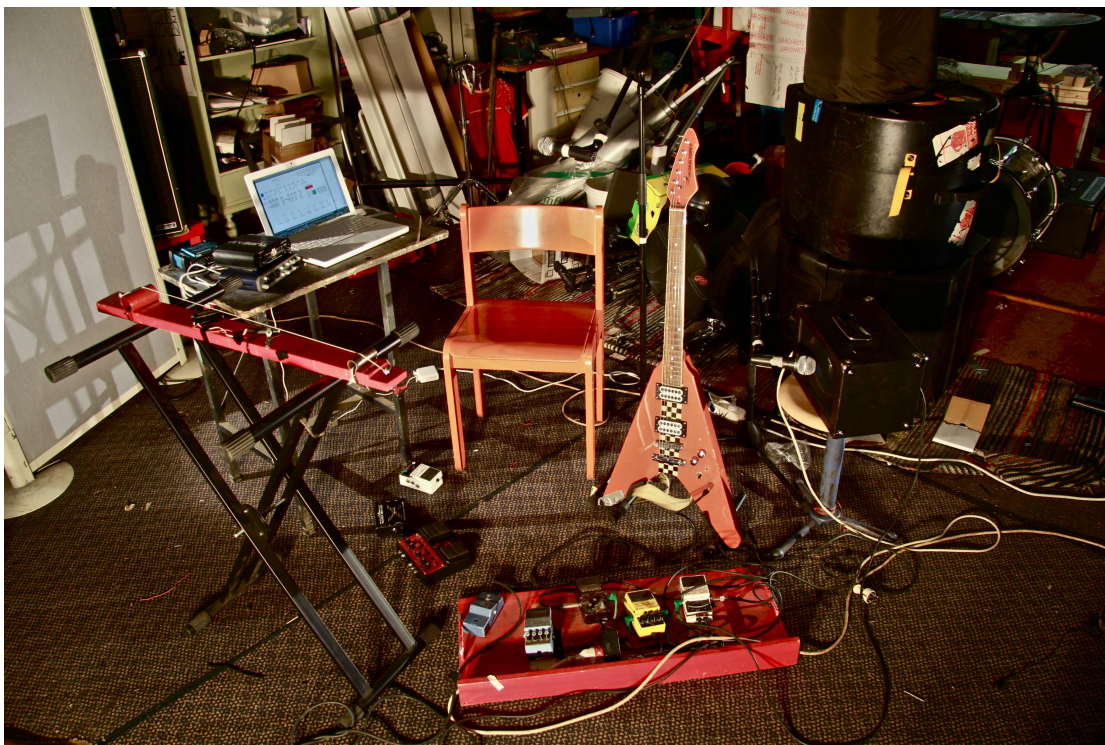


Figure 7: The setup

5.2.1 Pure data patch

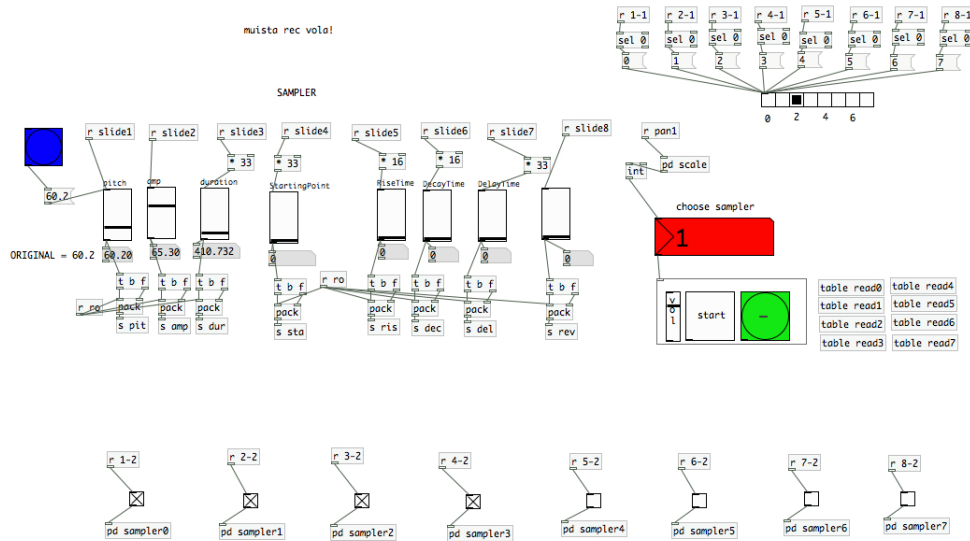


Figure 8: Screenshot of the Pd patch

The Pure Data patch that I used in the *I-Files* performance was a patch modified for Koray Tahiroğlu’s course Sound Design and Interactive Music. Originally it was used to route recorded samples individually into a 6-channel sound system. Later it was modified to be used as 8 separate samplers in stereo system. Every sampler could be manipulated in terms of pitch, amplitude, duration of the sample, attack, decay, delay and reverb. (See Figure 8.) Each sampler could be switched on to play continuously as a loop.

In the book *Interactive Music Systems* Robert Rowe classifies interactive systems into a combination of three dimensions. The first dimension distinguishes *score-driven* systems from *performance-driven* systems. *Score-driven* system is a program that uses “predetermined event collections [...] to match against music arriving at the input”. *Performance-driven* system is a program that “do not have a stored representation of the music they expect to find at the input.” In the second dimension are methods, which can be either *transformative* (produce variants based on existing musical material), *generative* (creates material based on given rules) or *sequenced* methods (based on pre-recorded material). Third dimension is distinguished between *instrument* and *player paradigms*. *Instrument paradigm* works as an instrument that a player interacts with, unlike *player paradigm*, which Rowe describes the following way: “Systems following a player paradigm tries to construct an artificial player.” (Rowe, 1993)

The patch was used as an performance-driven system, which in this case means that I created

all the material during the performance instead of using pre-recorded material. I processed the recorded samples (voice, guitar, percussion) and I created variants of them using DSP (Digital Sound Processing) techniques. In Rowe's classification, this is described as the transformative method.

5.2.2 Electric guitar

I needed an instrument in this project to play simple melodies with and electric guitar was a natural choice. However I didn't want to play in the same style I usually do. The material I processed with Pure Data did not always act as I preferred and was easily slightly out of tune. Therefore I ended up using a slide for playing the guitar. This way I wasn't stuck with playing only between frets but to play micro-intervals or use glissandos to find a suitable pitch by ear.

5.2.3 Hammered bass plank

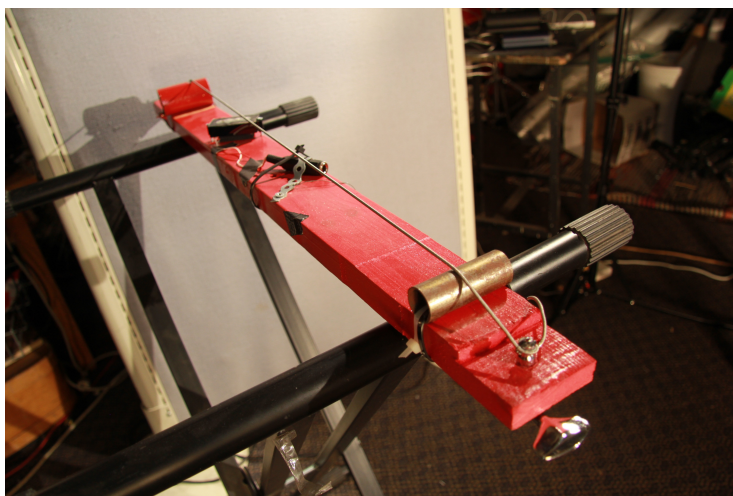


Figure 9: Hammered bass plank

I needed to get a vigorous sound in the low-frequency range, so I built a primitive instrument out of a bass-guitar string that was attached to a plank, onto which a pick-up mic and a tuning peg was mounted. It was made out of material I salvaged from our rehearsal place. In the end it turned out to be very essential and surprisingly multi-functional musical instrument with a lot of possibilities to produce sounds. With this instrument I was able to use different techniques, including tuner glissando, use of a slide, hammering the string with a stick etc. According its appearance and sound qualities I named it Hammered bass plank.

5.2.4 Hardware

The hardware in my setup consisted of a Boss Loop Station RC-20. Instead of a mixer I used a Boss LS-2 Line Selector and a Roger Mayer Crossroads Signal Director to route signals between the two systems, For the guitar I used a Boss OC-2 Octave and a Boss CH-1 Super Chorus. I used a small cassette player/speaker combo as a guitar amplifier, out of which I picked up the amplified sound with Shure SM58 dynamic microphone. I used another similar microphone for recording my vocals. The interface connecting my instruments effects, and my laptop was M-Audio Fast Track Pro. In the performance, I used two ART Tube MP Project Series pre-amps as DI boxes for both systems. The pre-amp has an output volume control, so I could do the cross-fades between two systems with these master volume controls.

5.3 Composing the music

In the book Audible Design the author Trevor Wishart defines three assumptions which are essential when composing with sounds:

1. Any sound whatsoever may be the starting material for a musical composition.
2. The ways in which this sound may be transformed are limited only by the imagination of the composer.
3. Musical structure depends on establishing audible relationships amongst sound materials. (Wishart, 1994)

This was the starting point for the forthcoming I-files live cinema performance. My aim was to create a non-linear soundscape. By non-linearity I mean that the produced audio material can be played back, processed, superimposed and looped as many times as desired thus creating a net of sounds that can be considered a soundscape. Extremely arduous to actualize with magnetic tape, but relatively easy to achieve with digital sound manipulation. On top of this soundscape I could play improvised melodies. I knew that the session would last approximately 30 minutes and the visual material would be divided into segments, in which the visual material would vary. I wanted this segmentation to be followed in music too, therefore my plan was to create 6 “themes” or soundscapes, that would last approximately five minutes each, but could last anything from one minute to half an hour, if needed. Each segment would start with a single sound or instrument and its complexity would be increased the longer it proceeds.

The performance would be interactive, therefore the structure couldn't be too predetermined. Since the production of the material happens live, it is possible for the performers to react to the material that is being produced and act accordingly. Image affects the music and vice versa. The

role of sound is different than in a silent film accompaniment, where the role of the music is just to accompany the picture. In the book *Soundscape*, edited by Sider, Freeman and Sider (2003) American artist Amie Siegel gives three examples of avant-garde film images, that don't interact with music in traditional way. Some of these methods applies also to the concept of live cinema: "There are many viewpoints, one of which proposes that no sound be added to the images because the images themselves are musical. An example [...] would be the work of American film-maker, Stan Brackhage, that reached a nadir with his hand-painted films and is continued today with the current movement of silent, hand-processed films. [...] Another viewpoint would be films that are based on a musical structure or a kind of John Cage-like chance operation. So the image and music can come together by chance, but be welded together in the marrying of the optical sound to the image. [...] Or, a third possibility, is to combine the sound and image live, with mixing and 'projector performance' which would open up the film even further to chance operations. (Sider, Freeman and Sider, 2003)

When I got my sound system connected and working, and I was able to control it fluently, I found it very easy to produce improvised material that resembled the soundscape I had envisioned. This can be considered as a success in the design of my setup. Surprisingly, the designing, building, and finding the signal paths for the sound system was the hardest part.

Quite soon I realized that the core of my musical themes would be either a loop, created with my slide plank bass instrument, or a loop created with vocals into Pd patch. The loops created with slide plank bass were rhythmic and fragmentary unlike vocal loops, which were dream-like and mellow. On top of these loops I would play guitar melodies with a slide.

I composed five or six different themes, all from which I knew how they would start and what instrumentation would be used. I sent these pieces to Mia and she commented on them. I had used a small drum kit to be able to produce rhythmic material. I recorded separate drums into the looper and crated layers of them. In some themes I also played the drums live on top of loops. However, this was something Mia considered too rhythmic to accompany the visual material. I decreased the role of drums and on the day of the performance I decided to not use them at all.

I had planned a structure of the performance based on the material I had composed. On the day of the performance we discussed about the visual material and according to this discussion I compiled the final order in which the themes would be performed. The length of segments was not planned in advance.

5.4 The structure of the performance

The performance consisted of 6 musical segments:

1. "Intro + Creepy Monks" started with a loop produced with a guitar. The guitar loop was



Figure 10: I-files performance

used as an extended intro in order to hear the correct pitch to record the vocal samples for Creepy Monks, which was a chant that consisted of layers of vocals that were recorded into Pure Data and pitch-shifted down. I played eerie notes with the guitar into the Loop Station and then reversed them. On top of this web of sounds I played slide guitar. I didn't use right hand for picking I usually do, instead I used it to make gentle oscillating movement with a slide in order to vibrate the string and make the guitar feed back.

2. "Slow Engine" was a piece consisting of layers of sounds produced with the hammered bass string recorded into Loop Station. The method was to use all the different playing techniques I could come up with in order to produce usable sounds.
3. "Breathing" consisted of breathing sounds that I recorded into Pure Data. The imagery was fresh and icy and I tried to achieve similar freshness with the soundscape. On top of the Pure Data loop I played very high-pitched sounds with the guitar using a slide.
4. "Ghastly Images" was an improvised section. I started to pitch-shift down the vocals on the Pure Data patch randomly plus add other effects to them. The idea was to create ghastly atmosphere.
5. "Stuck in Tar" was produced with hammered bass plank. This theme was much more rhythmic in the rehearsal period, but I reduced all the drums and used only hammered bass plank. I had decided the rhythmic pattern I started with, the rest was mostly improvisation.

6. “Outro” was created with vocal samples recorded for previous themes. It was a short outro to finish the performance.

5.5 After the performance

In the beginning of subsection 5.2 I had written three questions: How to put envisioned soundscape into practice? How to choose from theoretically endless possibilities of different musical instruments and sound systems? How to decide what kind of processing and performance techniques to use?

The first question is the hardest one to answer. I believe the answer lies in craftsmanship. The more you have expertise within your field, the better you intuitively know how to achieve the forethought end result. I will discuss this topic more in the next chapter. The second question is the easiest one to answer in this case, especially when time was very limited; one has to cope with the equipment one already has at one’s disposal, or is possible to build in very limited amount of time. If the equipment is familiar, it helps you to create material efficiently. At the same time, when exposed to unfamiliar techniques, it accidentally might help you to create something unexpected. Third question is best answered with one word; by authoring. Making things helps you proceeding in making things. It may sound self-evident and banal but it also is easy to forget. Doing something is a self-feeding system and to me the most essential thing is to begin to do something.

Designing the sound system and actualizing the soundscape to *I-files* was an interesting artistic and learning experiment. Anyhow, analyzing it afterwards I feel that the soundscape was not very successful in carrying out all the goals that I had in mind. During the performance I had to focus on technology, especially Pure Data. When performing with a laptop, it is important to have an easy access to all controllers unless you want to spend the whole time on stage staring at the display. The Pure Data patch I used was not as multifaceted as I had wished it to have been, mostly because of the lack of both my programming skills and time. At the same time I was very satisfied with the previously unheard sounds I could produce with my hammered bass plank.

During the performance, one serendipitous accident happened. Following the imagery, some parts of the soundscape were meant to be airy and breezy. After the performance, a Q&A session was held and a man in the audience asked me how the great sounds of the seagulls had been produced, to him they had sounded very natural. I was taken aback since I had had no intention to produce anything that would sound like birds. It turned out that seagulls had a nest in the roof construction and in the springtime the sounds of their nesting emanated inside.

6 Conclusions

After completing these two projects, what can I say about making live music for moving images? A couple of significant conclusions appear important.

Firstly, the bond between sound and image is strong. A still image is easily accepted without any sound just as it is. It is still and quiet and appears realistic. As soon as the image starts to move, it seems unnatural without sound because we are so accustomed relating sound to our visual perceptions in our everyday lives. Over a hundred years ago the audience got frightened when the pictures started to move. A moving picture is, perhaps subconsciously, considered to be representative of real life, and our real life is full of sound. But a moving picture is not real life, merely a reproduction of it, but nevertheless sound is needed. However, sound is subtle and crafty. The human ear is extremely accurate in hearing nuances and this is both a challenge and a blessing for an artist working with sound. Sound can be used in countless ways to affect one's perception, but also it is easy to accidentally get the listener sidetracked. All aspects of sound are important; timbre, amplitude, pitch, density and whatnot. Everything you put out, is out there exposed to people's inherent reactions. How should one choose from all the possibilities then? In this case, how can one be sure whether the music works with the images? My answer is: through intuition. Intuition is not magic, it is something that can be gradually learned. The more you work with sound, the better you learn to recognize the essential elements and how to modify them into the desired shapes. I think this applies to both sound and music.

What ingredients have to exist in order to construct a fluent accompaniment? I would say that this is not a technical aspect. A good accompaniment can be made out of anything, acoustic material, digital sound, perhaps even silence in the right context. I am quite sure it is of help, if there is inspiration, experimentation, hard work and some challenge involved.

Technology can be used in many ways, but does it affect the content? I believe it does and in many cases, unfortunately, it is the content. At least for some amount of time, until new aesthetics have been applied and accepted. In *Soundscape*, edited by Sider, Freeman and Sider (2003), Stephen Deutsch, professor of music design at Bournemouth University discusses new technologies in the following way: "Those who control the technology of a new medium control its content as well. As the technology spreads, the control of its content dissipates." (Sider, Freeman and Sider, 2003) Whenever technology is involved, the aesthetics have to be created and agreed upon. How this happens, is through experimentation by many. Deutsch gives another good example using some electronic music pioneers Stockhausen, Schaeffer, and their peers as an example: "Electronic music composers became the priesthood of a new aesthetic. They controlled the very expensive tools, they wrote the conference papers and journals, and they kept the unbelievers firmly out." (Sider, Freeman and Sider, 2003) Now the technology is available for everyone to take part in creating the aesthetics.

How can technology be used creatively and how it can be used to enhance the expression? I think creativity has to be forced out of technology. Digital sound art is about sculpting audio material into different shapes of waveforms. But technology doesn't do this by itself, there has to be a sculptor to decide how to do it. Technology makes audio sculpting possible and also affects the methods. It is important to know your methods in order to achieve what you are looking for. Technology can also be used to do things "wrong". With the help of technology it might be easier to end up somewhere you never thought of going and using technology makes it easier to make mistakes and new findings, that give you new directions.

This thesis has discussed two projects in which live music has been produced for moving images. These projects have been finalized and performed successfully and I am mostly satisfied with the end result. After many years of searching for personal expression in the group Kometa, being involved in the making of silent film accompaniments and experimenting with self-customized instruments and sound systems in *Cleaning Women*, I feel I have built a firm platform to stand on. I managed to create a unique accompaniment using techniques which I had never used before. Considering this, the creation of the soundscape for live cinema performance *I-files* was a personal triumph, even though I could not perfect it in the exact way I would have wanted. I think it is important to keep your ears and eyes open for new possibilities in expanding your expression. Using self-made instruments and customized sound systems and creating your performance techniques with the aid of technology can help in achieving this goal.

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