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Music for the eyes

trails of visual music from the 20th to the 21st century

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Abstract

This research explores how the visual and sound arts are conjugated throughout visual music. I inquire into the different artworks and artists of visual music in the 20th and 21st century. The term visual music is discussed briefly at the beginning, showing the different perspectives proposed by specialists and making small comparisons between definitions. Going through the early manifestations in color music and *cymatics* (the study of sound frequencies through the visualization of its waves), the connection with painting and abstract art, to the arrival of the experiments in the avant-garde and finally materializing the visual music culture in film, the history continues with the development of the visual music practice and the influences of other art movements in their aesthetics and ideas. Before arriving to the 2000's, I present some context by mentioning key figures in the contemporary music and the artistic climate in the previous decades. In addition, I dedicate a chapter entirely to silence, focusing in *silent music* and *silent visual music*. As a closure, I extract conclusions that relate with the contemporary aesthetics of visual music, the contributions made to other artistic realms, and to future research topics that have not yet been addressed.

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1. Introduction

From a personal artistic need, I started to work with scenic elements of visual and performing arts in my compositions. I imagined music and picture cohesively, both of equal importance in the development of a piece. Some images and movements allowed me to experience sounds that otherwise I could not have known. Sounds that were of course imagined, triggered by what I saw. At the same time, a specific sound or music could change the meaning and intensity of an image. Colors could be highlighted just with the sound that holds the scene together, and time would be perceived differently.

The line between music and visual arts became thinner and thinner with every new piece I made and every concert or festival I attended. The elements of one were mirrored and even transferred into the other and I realized that the idea of visible music appeared repeatedly in the work of the contemporary musicians and visual artists.

It was clear for me that the research had to have some relation with the subject. And so, by looking at the long trajectory of music and visual arts, I eventually stumbled upon visual music. I was immediately intrigued by the incredible diversity of the works, the contrast of styles, aesthetics, not to mention the different backgrounds from which each artist came. Cinema, dance, painting, classical or electronic music, technology and some of the most extravagant inventions have all coexisted in visual music, opening a space between academic labels and traditions, where the focus is on the points of encounter of image and sound and in an expanded synesthesia and an immersive experience. And so, I went on to gather information and start the research.

As soon as I started reading about visual music, I realized that there were only a few researchers actively writing about it. In fact, most of the articles and books, made reference to each other and the authors often acknowledged that the *“recurring problem in visual music field today is lack of thorough research and accurate scholarship”*¹. This made me think about the influence of visual music in my work, my colleagues’s works and in general, the current state of the arts which is basically built on trans-disciplinary projects. How-

¹ Ox, J and Keefer, C. (2006) *“On Curating Recent Digital Abstract Visual Music.”* Retrieved October 30, 2018, from Center for Visual Music, https://www.centerforvisualmusic.org/Ox_Keefer_VM.htm

ever, there are very few people that are familiar with visual music and even fewer that are aware of the contributions made by this practice.

By realizing how little is known about the subject and how rich it is, I decided that visual music would be the theme of this thesis. It would not only be a good fit to my own interests and work, but it could also help other artists and specially composers to learn about it and make use of its advantages.

1.1 Research questions

After being confronted in a daily basis with the interaction of music and image, it seemed imminent to learn and revisit the link between these two. The long love affair between music and visual arts started long before the subdivisions of these two separated one realm from the other. With time, the difference between sound and image, became more important than the things they had in common. But in the turn of the 20th century, the overwhelming outburst of new art expressions, movements and ideas, shifted the paradigm to an open and common ground that would built a solid platform of dialogue among the various art forms (music, visual and performing arts), leading eventually to the concept of visual music coined by Roger Fry.

Although looking into the definition of visual music is a fundamental part of the research, the focus is not on the semantic discussion of the term, but on meeting points of different medias and the forms that derive from these. The question in hand centers on visual music's development: how are the visual and sound arts conjugated throughout the Western history of visual music? What ideas seem to reappear when observing its history? What were the contributions to the arts and how are these manifested today?

1.2 Method and presentation

In visual music there is an amalgam of art forms and disciplines that provide a type of work that is open in format yet focused on the interlace of music and visuals. It grants a particular perspective while embodying multiple shapes that allow an ample vision of the

field of interest. But this same quality seems to complicate the task of finding an appropriate definition.

Visual music can be described as “*an interdisciplinary, broad-based art movement that explored the relationship of abstraction, color, and music*”², and covers various types of works that embody qualities of music into a visual or audiovisual format. The definition has often been examined and questioned, which is why chapter two is devoted to knowing the different notions of visual music. To achieve this, I will be examining key archives such as exhibition catalogs, research papers, and books, most of them written in the past ten to fifteen years.

Once having observed the academic perspectives, I will proceed by going through some early manifestations of visual music in chapter three. I will be tracking down theories and experiments of the 17th and 18th century, which have constituted a ground for the present-day artists.

The following chapter four will be focused on the main influences of visual music — abstract painting, some avant-garde movements of the turn of the 20th century and the historic climate— which will lead to the origin of the term in the 1910’s.

Next, from chapter five to eleven, the bloom of visual music will be shown through the pioneers’s work and the many experiments done between 1900 and 1950 that echo through the second half of the century in artistic proposals. As I inspect the history of visual music, the contributions and links to other artistic and musical realms will be mentioned in parallel until finally arriving to the current state of the arts, where these connections give birth to new practices.

Chapter twelve, before extracting conclusions, is a study case of my work in connection with visual music: what elements of the practice are there, what ideas are there in common, how is visual music manifested, etc. I see in this section a space for self-observation and analysis that will help understand better the purpose of each piece and the ideas behind this particular phase in my artistic development.

² Brougher, Mattis, Strick, Wiseman. “*Visual Music: Synaesthesia in Art and Music since 1900.*” Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005.

Returning to the big picture, the intention of this thesis is to provide an overview of visual music's history, perspectives and contributions. I hope the research done here, helps the appreciation, recognition and curiosity for visual music, "*a discipline that has shown consistent development for well over one hundred fifty years*"³, and that has given us a open space for the dialogue of the arts, music, and everything in between.

2. Definition of visual music

Visual arts and music have been influencing each other for hundreds of years, and its multiple manifestations and possibilities may be the main reason why the concept of visual music is still so ambiguous. The meaning of visual music is indeed unclear for most artists and musicians, even though it is present in several works and ideas of the avant-garde, influencing almost every branch of the arts in the end of the 20th and 21st century, not to mention the impact in the popular culture in relation with technology.

In order to understand and find an updated definition of visual music, I have gone through the work of leading researchers, which have provided a vast range of positions and opinions on the subject. It is in this broad and wide variety of definitions, at times incomplete and contradicting the very origin of the term, where one can actually see the evolution and development of visual music.

It is important to emphasize that I do not attempt to present an ultimate definition, but to find an outline that incorporates the many forms of visual music. This is crucial for comprehending the interlaced lines of work of visual music.

The discussion begins by asking from which perspective is visual music being observed. Some definitions focus on music as the starting point of visual music and make emphasis on the translation of musical elements to their visual representation. For example, the definition in the Visual Music Award's website which draws "*a historical line from Pythagoras to Oskar Fischinger and Len Lye, which gives a general idea of the organizers' viewpoint*:"

³ Ox, J and Keefer, C. "On Curating Recent Digital Abstract Visual Music." 2006. Retrieved October 30, 2018, from Center for Visual Music, https://www.centerforvisualmusic.org/Ox_Keefer_VM.htm

*“Visual music refers to the transposition of melodic, harmonic and rhythmic coherences in pictures through the composition of space and time. It’s a dynamic art form in which a special effect is achieved by the equal-footed interaction of visual and musical material.”*⁴

*“to concepts of transferring organizational principles coming from music onto the (moving) image, an idea that harkens back to the turn of 19th to 20th century.”*⁵

Like this definition, the term is often related with a time-based visual imagery, based on the fact that the first pure visual music works were developed in expanded cinema, abstract animation, and video art. But, some authors consider as well silent works like the Lumia pieces by Thomas Wilfred, as part of the visual music culture. In these cases, it is usually specified as a possibility within the visual music concept.

*“Visual music can be defined as time-based visual imagery that establishes a temporal architecture. It is typically non- narrative and non-representational (although it need not be either). It can be accompanied by sound but can also be silent.”*⁶

*“Visual music, sometimes called color music, refers to the use of musical structures in visual imagery, which can also include silent films or silent Lumia work. It also refers to methods or devices which can translate sounds or music into a related visual presentation. (...) Visual music has also been defined as a form of intermedia.”*⁷

As we move forward, we observe how the term sometimes alludes to its multi-disciplinary nature and goes further away from a literal visual representation of music, as it was suggested in one of the first definitions.

⁴ Lund, C. & Lund, H. *“Visual Music-Aspects of a Non-Genre”* Lund, C. and Lund, H.(eds.). Lund Audiovisual Writings, 2017. <http://www.lundaudiovisualwritings.org/non-genre>

⁵ Naumann, S. *Seeing Sound: The short films of Mary Ellen Bute*. In: Lund, C. & Lund, H. *“Audio visual: On visual music and related media”*. Arnoldsche Art, Stuttgart, 2009. (p. 41)

⁶ Evans, B. *“Foundations of a Visual Music”*. Computer Music Journal, 29:4, 2005. (p.11-24)
doi:10.1162/014892605775179955

⁷ Wikipedia. *Visual music*. 2019. Retrieved January 14, 2019, from https://en.wikipedia.org/wiki/Visual_music

“if we define visual music as a description for audiovisual productions pursuing the basic objective of a structural interplay between, and intertwining of, visual and acoustic components that leads to a new, genuinely audiovisual creation, then the questions of how audio and video come together in this kind of production, and whether visual music is a genre or an audiovisual practice, are no longer of major importance.”⁸

“Visual music is an interdisciplinary, broad-based art movement that explored the relationship of abstraction, color, and music. (...) A trail that leads from abstraction in painting through light projections and abstract film to video and digital recording, as well as multimedia installations.”⁹

And then, there are other definitions that go back to the very first use of the term to present poetic metaphors that unlink visual music with the time-based parameter and puts them closer to a more aspirational aim.

“a visual composition that is not done in a linear, time-based manner, but rather something more static like a 7' x 8' canvas.”¹⁰

“Visual music traces the history of a revolutionary idea: that fine arts should attain the non representational aspect of music. (...) Visual music constitutes a distinct aesthetic tradition based on shape precepts and metaphysical aspirations.”¹¹

Another element that appears repeatedly in more than one definition, is the one related with the origin of the term, which emerges from abstract painting: non representational imaginary.

⁸ Lund, C. & Lund, H. *“Visual Music-Aspects of a Non-Genre”* Lund, C. and Lund, H.(eds.). Lund Audiovisual Writings, 2017. <http://www.lundaudiovisualwritings.org/non-genre>

⁹ Brougher, Mattis, Strick, Wiseman. *“Visual Music: Synaesthesia in Art and Music since 1900.”* Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005. (p.10)

¹⁰ Ox, J and Keefer, C. *“On Curating Recent Digital Abstract Visual Music.”* 2006. Retrieved October 30, 2018, from Center for Visual Music, https://www.centerforvisualmusic.org/Ox_Keefer_VM.htm

¹¹ Brougher, Mattis, Strick, Wiseman. *“Visual Music: Synaesthesia in Art and Music since 1900.”* Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005. (p.7-10)

Most of these aspects are mentioned in the four structures that Cindy Keefer and Jack Ox recognized after curating the *Abstract visual music* exhibition in 2005:

- *“Visual music can be understood as a sonic composition translated into a visual content, with the elements of the original sonic ‘language’ being represented visually. This is also known as intermedia.*
- *Visuals follow a certain narrative structure that compliments the sonic structure. The final audio-visual composition can include sound or it can be silent.*
- *A real time translation from visual to sonic or from sonic to visual. These images, which can be in different formats, are simultaneously projected as sound is being played.*
- *The image composition can also be static (e.g. a painting). The theme is the artist’s personal interpretation of specific music.”*¹²

These proposals contemplate the translation of music to image, the interdisciplinary quality that predominates in visual music, the time-based or static form in connection to painting and the silent composition possibility. It does not mention though, the abstraction and non-representational language often considered a must in visual music. It does also not go into the discussion of whether is a movement, a genre or a discipline. But this has been investigated and treated in Cornelia Lund’s *“Visual Music -Aspects of a Non-Genre”* first published in *Tanzende Bilder. Interaktionen von Musik und Film* by Klaus Krüger and Matthias Weiss.¹³

Contemplating all of these characteristics, contradictions and dilemmas, one can see the importance of visual music in the current art and music scene, which deals now more than ever with the same questions and semantic problematic. This is something that also applies to the contemporary music niche (not mention the visual and performing arts), which has expanded its practice to theater, video art, dance, etc., since a few decades. This

¹² Ox, J and Keefer, C. *“On Curating Recent Digital Abstract Visual Music.”* 2006. Retrieved October 30, 2018, from Center for Visual Music, https://www.centerforvisualmusic.org/Ox_Keefer_VM.htm

¹³ Lund, C. & Lund, H. *“Visual Music-Aspects of a Non-Genre”* Lund, C. and Lund, H.(eds.). *Lund Audiovisual Writings*, 2017. <http://www.lundaudiovisualwritings.org/non-genre>

complexity of intertwine disciplines can be taken as an advantage for creating art and music (or both) outside of the traditional norm.

I see this reexamination of concepts and visual music definitions as part of the history and development of it. And by observing and learning the different perspectives, there is a sense of relief that lies on the realization that *“no matter how clear the core of contemporary visual music may be defined by convention, this core is surrounded by a vast area of vagueness, a mixture of lacking and contradicting definitions in combination with a quickly evolving and ever changing practice.”*¹⁴

3. Early connections between music and image

Although it has been said that the history of visual music starts *“specifically in France with Clavecin Oculaire (Ocular Harpsichord) of Castel of 1734”*¹⁵, its origins can be tracked back to the idea of synesthesia in the ancient Greek philosophies in the 6th century BC (“Music of the spheres” by Pythagoras), in the 4th century in Aristotle’s idea of harmony of color with harmony of sound, and in the many theories and experiments on color-shape and sound that would take place in the 16th, 17th and 18th century. In any case, the cymatic studies and the theories of color in relation with the music will undoubtedly be of great relevance for the artists of the 20th and 21st century.

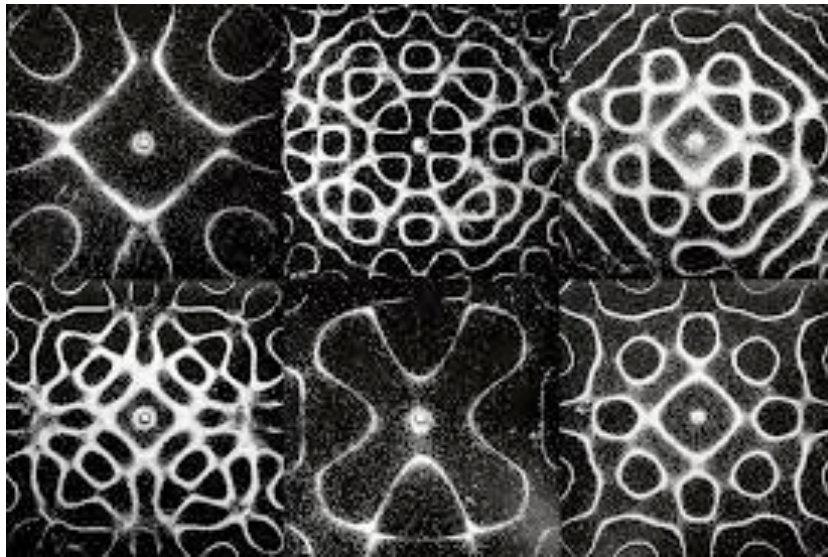
3.1 Cymatic experiments

In the field of physics, the studies of sound and shape started already in 1630 with Galileo Galilei and later in 1680 with the philosopher and architect Robert Hooke. In order to see the patterns of a frequency, Hooke used a glass surface covered with flour to which he would apply vibration by running a bow against the edge. These experiments were then perfected in 1787 by the German physicist Ernst Chladni and finally named as *Cymatics* by Hans Jenny in 1904. Jenny invented later the *tonoscope*, a device that displayed the

¹⁴ Lund, C. & Lund, H. “*Visual Music-Aspects of a Non-Genre*” Lund, C. and Lund, H.(eds.). Lund Audiovisual Writings, 2017. <http://www.lundaudiovisualwritings.org/non-genre>

¹⁵ Ox, J and Keefer, C. “*On Curating Recent Digital Abstract Visual Music.*” 2006. Retrieved October 30, 2018, from Center for Visual Music, https://www.centerforvisualmusic.org/Ox_Keefer_VM.htm

visual representation of the human voice onto a screen. By observing the shapes of sounds, he could identify that the low frequency patterns were more simple, whereas with high tones the image resulted in complex designs. This approach of shaping sound has been developed through the years and transported to almost every technology and media available, contributing enormously to the exploration of visual music, not to mention to the researches in physics, maths and science in general.



Chladni's Cymatic experiments

Di Vito, G. (2014). Cymatics. Retrieved November 12, 2018, from <http://www.thecymartist.com/cymatics>

3.2 Color music

Regarding color and sound, we have to go back to the 16th century, to the Italian painter Guiseppe Arciboldi. Based on a simple pitch-color principle where white represented deep notes and black high ones, Arciboldi proposed a scale of brightness of color in relation with the Pythagorean harmonic proportions of tones and semitones. During this period, there were several ideas of color and sound in connection with mathematics and physics. Isaac Newton, for instance, suggested in 1704 that the increase of the frequency of light in the color spectrum, corresponded to the increase of the frequency of sound in the diatonic major scale. This idea linked the seven colors of the rainbow with the seven notes of a diatonic scale.

		C	C#	D	D#	E	F	F#	G	G#	A	A#	B
Isaac Newton	1704												
Louis Bertrand Castel	1734												
George Field	1816												
D.D. Jameson	1844												
Theodor Seemann	1881												
A. Wallace Rimington	1893												
Bainbridge Bishop	1893												
H. von Helmholtz	1910												
Alexander Scriabin	1911												
Adrian Bernard Klein	1930												
August Aepli	1940												
I.J. Belmont	1944												
Steve Zieversink	2004												

Color and pitch theories from 1704 to 2004.

Harmon, P. "Brief History of Visual Music". Retrieved November 12, 2018, from <https://overprocessedthinking.com/brief-history-of-visual-music/>

Like Newton, the French mathematician Louis Bertrand Castel, proposed in 1743 a system in which a range of twelve colors corresponded to the twelve semitones of the chromatic scale. This system, led to the invention of the *Ocular Harpsichord*, which displayed a color to each specific note. Although there were no publications about the construction of the instrument on part of Castel, the German professor Johann Gottlieb Krüger, presented a few years later a design based on the little information provided by the visitors of such first *Ocular Harpsichord*.¹⁶

The connection between color and pitch has been used since then as material for creation and composition of art and music works. In parallel, it has had some impact in some unorthodox learning techniques. One interesting example, which I here mention only because of the strong impact that this method had in my musical education as a child, is *Música en colores* created by the Chilean pianist and composer Estela Cabezas. In this method, the children are introduced to the score by relating each tone to a color and each note's duration to a shape. This allows the children to read music from a very intuitive way, providing as well an integral and different perspective that helps the development of both, color and sound sensitivity. A down side of this system would be that it could forged an unnecessary and sometimes distracting association of pitch and color, making it more difficult for people with absolute pitch, to experience music without a pre-conditioned projection of a limited range of colors, as opposed to the subtleties that can be imagined without this learning.

¹⁶ Museum of Imaginary Musical Instruments. "Ocular Harpsichord". Retrieved October 30, 2018, from <http://imaginaryinstruments.org/ocular-harpsichord/>

4. Painting and Music

*“The idea of synesthesia served to mediate between music and visual art in the early 20th century and proved essential to the development of abstraction.”*¹⁷

The long love affair between music and visual arts started long before the subdivisions of these two separated one realm from the other. With time, the difference between sound and image, became more important than the things they have in common. But in the turn of the 20th century, the overwhelming outburst of new art expressions, movements and ideas, shifted the paradigm to an open and common ground that would build a solid platform of dialogue between the various art forms (music, visual and performing arts), leading eventually to the concept of visual music.

As it was previously revised, visual music encompasses a wide radius of media, genres, technologies and art forms, making it more complex *“to define the exact moment in historical development when the visualization of music became visual music.”*¹⁸ But in spite of this chronological ambiguity, the story of the origin of the term is to our luck very easy to place in time, since it is found in the catalog of one of the most important exhibitions in art history.

4.1 Origin of the term

At the end of 1910, the English painter and critic Roger Fry, organized *“Manet and the Post-Impressionists”*, an exhibition located in Grafton Galleries in London, that would be later known as the *“First Post-Impressionist Exhibition”*. The event compiled works of Cézanne, Gauguin, Van Gogh, Matisse and Manet, to mention a few.

¹⁷ Brougher, Mattis, Strick, Wiseman. *“Visual Music: Synaesthesia in Art and Music since 1900.”* Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005. (p.16)

¹⁸ Lund, H. *“Visual Music”*. Lund, C. & Lund, H.(eds.). *An den Rändern des Films -Vom Lichtspiel bis zum Filmtanz*. Lund Audiovisual Writings, 2006. www.fluctuating-images.de/wp-content/uploads/2018/12/Visual_Music_engl.pdf

In 1912, Fry arranged again in the same venue the “*Second Post-Impressionist Exhibition*”, which now gathered works of the avant-garde British artists, Lewis, Gill, Grant, etc, alongside with Picasso, Braque, Cézanne and Matisse, among others.

So, why are these exhibitions relevant to us? What is the importance of impressionism in visual music? Well, even though the development of visual music takes place in the 20th century based on the avant-garde movements of the beginning of the 1900's, *“the idea of musical analogy in painting originated in the late 19th century (...) when European and American artists began to ‘compose’ abstract painting that emulated the aesthetic purity of music.”*¹⁹ At the same time, the main influence of these avant-garde movements can be tracked back to the impressionists. Cubism, with Braque and Picasso as pioneers, was inspired by Cézanne's representation of the three dimensions. In parallel, Matisse and Derain, maintaining a more realistic style, took the prominent use of color in Gauguin's and Van Gogh's work to develop the fauvism. On the other hand, expressionism, which had many influences including Van Gogh and Munch, reacted strongly to the industrialization and dehumanization that came with the modern times. This opened the space to other contributions like Kandinsky's abstract painting, of which I will speak in the next chapter.

Probably the most accurate description of the cultural and artistic climate of the 1900's is in Roger Fry's text in the preface of the catalogue of the *Second Post-Impressionist Exhibition*:

“...the feeling on the part of the public may, and I think in this case does, arise from a simple misunderstanding of what these artists set out to do. The difficulty springs from a deep-rooted conviction, due to long-established custom, that the aim of painting is the descriptive imitation of natural forms. Now, these artists do not seek to give what can, after all, be but a pale reflex of actual appearance, but to arouse the conviction of a new and definite reality. They do not seek to imitate form, but to create form; not to imitate life, but to find an equivalent for life. By that I mean that they wish to make images which by the clearness of their logical structure, and by their closely-knit unity of texture, shall appeal to our disinterested and contemplative imagination with something of the same vividness as the things of actual life appeal to our practical activities. In fact, they aim not at illusion but at reality.

¹⁹ Brougher, Mattis, Strick, Wiseman. “*Visual Music: Synaesthesia in Art and Music since 1900.*” Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005. (p.15-20)

The logical extreme of such a method would undoubtedly be the attempt to give up all resemblance to natural form, and to create a purely abstract language of form — a visual music..."²⁰



Catalogue of second Post-Impressionist Exhibition Grafton Galleries, 1912, "Vision and Design", Chatto & Windus, London, 1920.

Rekveld, J. The origin of the term visual music at light matters. Retrieved November 14, 2018, from <http://www.joostrekveld.net/?p=1105>

Despite of the undoubted connection with painting, it will not be there where the visual music culture cultivates. The term is instead adopted by film and time-based media, to develop abstract animation, film, and colored light pieces.

4.2 Wassily Kandinsky and Arnold Schoenberg

During the first half of the 20th century, we find a very strong connection between painting and music, where avant-garde proposals and statements appeared mirrored in image and sound. The idea of breaking from the traditional models and rules manifested almost simultaneously in both realms. Harmony and figurative painting were then dismissed in favor of atonal methods and abstraction. Indeed, I am referring to the relation between

²⁰ Fry, Roger. "Catalogue of second Post-Impressionist Exhibition", Grafton Galleries, 1912. Vision and Design, Chatto & Windus, London, 1920, (p. 157). Retrieved November 14, 2018, from Rekveld, J. "The origin of the term visual music at light matters." <http://www.joostrekveld.net/?p=1105>

Kandinsky and Schoenberg, whose works would mark the beginning of a new era respectively in art and music.

Since the first encounter, the congruence of their theories connected their works and inspired further development. A ground was established to build on each other's pieces and perspectives, which encouraged an even more dramatic manifesto to their already radical discourse. A sustained tone, a pizzicato or a cluster would become to the painter a line, a dot or a plane, and the evolution and progression of each of these elements would be its own free and autonomous trail. This was an outbreak premise that released music from the long used tonal system (which was also strictly limited by traditional forms and structures) and liberated painting from the compositional regulations and figurative statute.

Consequently, after listening to the Second String Quartet in 1911, the Russian painter wrote to the Austrian composer: *"You have realized in your work that which I have so long sought from music. The self-sufficient following of its own path, the independent life of individual voices in your compositions, is exactly what I seek to find in painterly form."*²¹



Wassily Kandinsky
Untitled, 1921
Kunstmuseum Basel, Basel

Briggs, I. (2013, August 20). Seeing Sounds: Kandinsky Schoenberg. Retrieved December 7, 2018, from <https://www.artsy.net/article/ibiayi-seeing-sounds-kandinsky-plus-schoenberg>

²¹ Briggs, I. "Seeing Sounds: Kandinsky Schoenberg." 30, Aug. 2013. Retrieved December 7, 2018, from <https://www.artsy.net/article/ibiayi-seeing-sounds-kandinsky-plus-schoenberg>

Thanks to the experiences triggered by music, Kandinsky was inspired to create a purely abstract painting²² and thus, the beginning of expressionism. The construction of shapes and colors was in relation with the idea of sound and rhythm. Kandinsky believed that the shapes in his painting would resonate with each other and create a chord as it happens when overlapping two tones in music. The composition of the colors and forms in the paintings are implicitly creating a sound that Kandinsky imagined and designed for each particular work.

From Kandinsky's ideas and work, a long line of expressionist painters would come and present a new perspective, one that is not at the service of recreating exactly what it is seen, but instead focused on portraying a different possible reality.

5. Avant-garde of the turn of the century (1900's-1930's)

The 20th century was moved by a number of events that would redefine not only the day to day life but also the arts and music history. The birth of the most influential art movements was originated during this period together with the development of new art forms like film, media art and light art, that emerged from technological advances and the subsequent digital revolution. But already at the beginning of the century, one can see the fast evolution of the arts in abstract painting, the collapse of the tonal system —and consequently, the emergence of atonalism and serialism— and visual music which appears in between the different movements of the avant-garde.

5.1 The Italian Futurists

In 1909 the poet Filippo Tommaso Marinetti presented to the world the futurist manifesto that marked the beginning of the Futurist movement. With its unmistakable link to fascism,

²² It has been recently argued that the first abstract painting was actually by Hilma af Klint (1862 - 1944), a Swedish painter that developed abstraction years before Kandinsky, Malévich and Mondrian. (<https://www.theartstory.org/artist-af-klint-hilma.htm>) It is also known that Arnaldo Ginna was also developing abstraction already in 1908 with his painting "Neurasthenia". (http://www.ginnacorra.it/ginna/cenni_biografici.html)

its aggressive ideas and a dark passion to violence and struggle, one might wonder why this movement is positioned in the forth front of the avant-garde. But with all that was disrupted in their extreme ideas, the ties of tradition that were for so long holding down the evolution of art were suddenly torn apart. It was thanks to these radical statements that embraced the industrial era and abolished everything that was left in the past, that the boundaries were pushed to explore beyond the standards and expectations of their realm. And the manifesto was the motor that drove the movement for almost 35 years until the death of its creator in 1943.

While the first futurists were based on painting, the generation of the 20's experimented with all arts wanting to remake the world with a modern eye, a futuristic approach to music, food, design, etc. Here is where we find some of the first films of Visual Music.

Arnaldo Ginna, of artistic formation, and Bruno Corra, writer and screenwriter, were well known brothers from an aristocrat family that collaborated in a series of projects related to Visual Music. After having failed in the construction of a color organ, they set up to experiment with film. By using the technique of drawing directly on the film, which was later developed in depth by Norman McLaren and Len Lye, they would release in October 1911 "*A Chord of Color*". During the same month, three other films were made, "*Study of the Effects of Four Colors*", "*Song of Songs*" and "*Flowers*", and in the years that followed another five more. Unfortunately all nine films were lost and can be only imagined by what Ginna described: "*While the first film was the development of a color chord, the second studied the effects among complementary colors (red-green, blue-yellow) and the last two were chromatic renderings of music and poetry.*"²³

5.2 Artifacts, art and music in the Soviet Union

Visual music had already started to bloom in some parts of the world, before the Italian Futurists who are credited with the first pieces of visual music, presented their films. Around the 1920's and 30's the advances of new technologies parallel to the artistic progress in the Soviet Union contributed enormously to the development of the arts and music in the world.

²³ Zinman, G. "*Arnaldo Ginna and Bruno Corra.*" 2011. Retrieved January 24, 2019, from <http://www.handmadecinema.com/mobileview.php?id=20>

During the Soviet-Era in Russia, the painter Daniel Vladimir Baranoff-Rossiné (1888-1944) eager to make a piece that would combine light, movement and music, conceived the *Piano Optiphonique*, an instrument that unfortunately failed to produce all three, but successfully became the first instrument to project light. This instrument had the appearance of a common keyboard but instead of hammers and strings, had disks that would rotate when pressing the keys. Each of these disks had colors and hand-painted pictures that interacted with three lenses, a kaleidoscope and a lantern.²⁴

Since the *Piano Optiphonique* had the exact same key system as the traditional piano, it allowed the player to read directly from a score. The result would not be acoustic (except for sounds of the mechanism), but it would create a colorful theater-screen size projection that the inventor thought to be accompanied by music. Although the instrument was created in 1907, it was not until 1922 when it was finally completed and played for the first time.

A number of artifacts and machines were built in the Soviet Union for experimenting with light, painting, sound and dance. This could be a consequence of the airs of the times, where the aim was to achieve an immersive aesthetic interdisciplinary experience, or maybe it had to do with a political agenda that searched (like the futurists with their own manifesto) to embody the concept of socialism in every aspect of the art, music, design and technology.

With the aspiration of producing artificial sound, Evgeny Sholpo invented the *Variophone* in 1932. It was a photo-electrical optical synthesizer that used cardboard disks in sound waves forms that rotate in sync with a 35mm film while being recorded. The process could then be repeated again to create multi-layer tones that were later played on a normal movie projector.

Although, the machine was able to produce both visual image and sound, it would be often used just to make the soundtracks for soviet animation films. The first artificial soundtrack was made in 1930 for the lost film “*The Year 1905 In Bourgeois Satire*” in collaboration with the composers Georgy Rimsky-Korsakov and Arseny Avraamov.

²⁴ Facts1900b. (2006, December 04). “*Piano Optiphonique*”. Retrieved December 6, 2018, from <https://www.youtube.com/watch?v=l2BnanDDeFg>

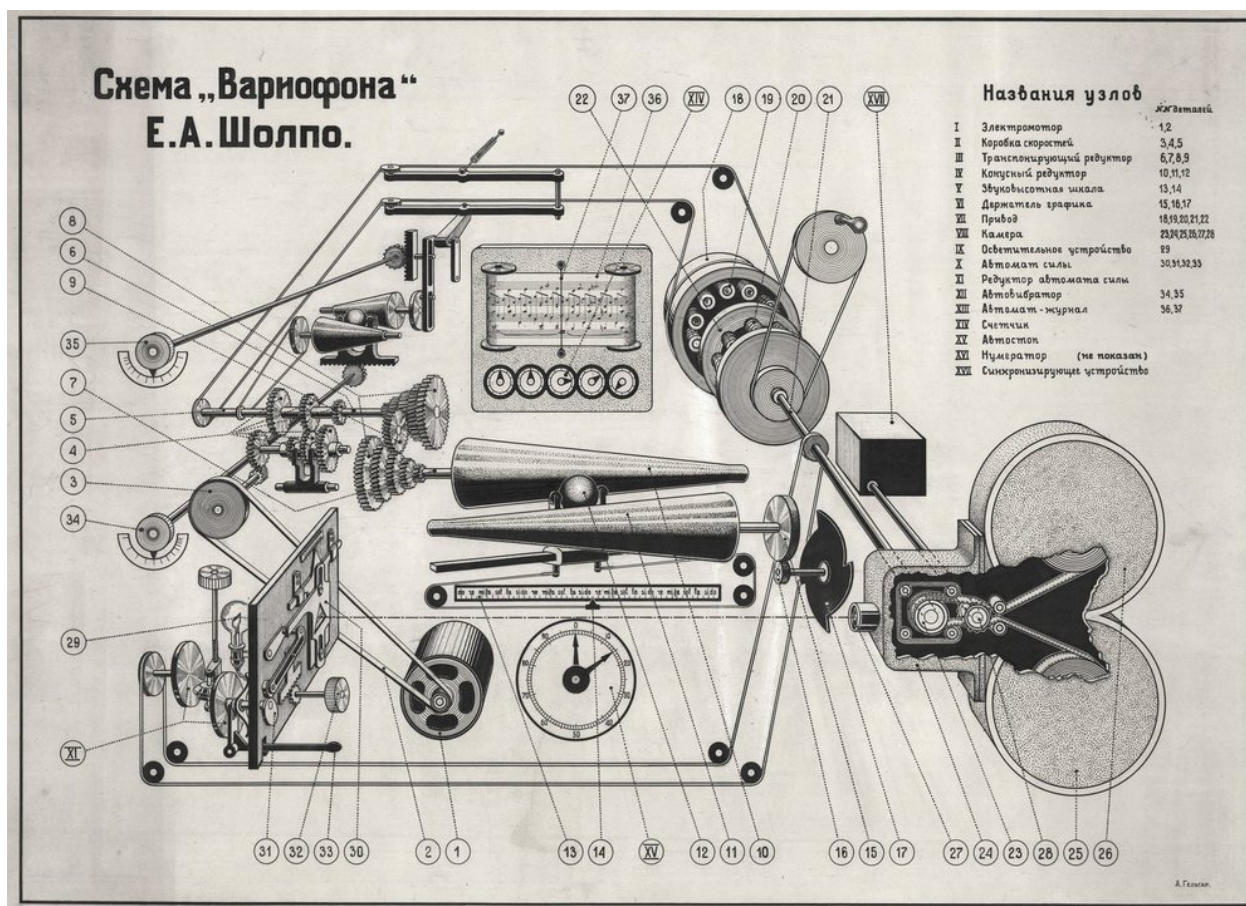


Diagram of the Variophone

Budzinski, N. "Soviet Light Music". 23, Feb 2016

Retrieved December 7, 2018, from <https://journal.beoplay.com/journal/2016/2/11/soviet-light-music/>

Arseny Avraamov (1886–1944) inquired in the trans-disciplinary, delivering a considerable amount of pieces that are now proving to be ahead of his time. Known for his extravagant compositions, Avraamov did not fail to surprise and innovate with his ideas. In 1922 for the fifth anniversary of the Soviet Republic he presented the "*Symphony Of Factory Sirens*", which made use of an extensive band, a choir, car and bus horns, machine and artillery guns, cannons, airplanes, whistles and various kind of sirens including the foghorns of the entire Soviet flotilla of the Caspian Sea. This piece appears to be one of the biggest music productions made in the times.²⁵

While the music of the Avraamov was definitely not traditional, it still responded to a harmonic, melodic and rhythmical order that probably came from the romanticism. At the

²⁵ Budzinski, N. "Soviet Light Music". 23, Feb 2016. <https://journal.beoplay.com/journal/2016/2/11/soviet-light-music/>

same time, the strong presence of songs and anthems, in contrast with sirens and noises, make a drastic and odd combination that reminds in a way to Luigi Russolo's noise machines²⁶. There is no doubt that the atmosphere of the war is impregnated in Avraamov's music, as it will be in the music of the next generations.

An important research of Avraamov, was a 48-tone microtonal system that he presented as *Ultrachromatic* in his thesis in 1923. This proposal was prior to the creation of the Circle of *Quarte-tone Music* by Georgy Rimsky-Korsakov, grandson of Nikolay Rimsky-Korsakov.

In a collaborative research around the 1930's, Avraamov, Alexander Shorin and Evgeny Sholpo developed the *graphic sound* technique, *graphic sonic art* or *ornamental sounds*, which uses the optical sound track of the film as canvas to draw sound waves. A similar concept was applied to the functioning of the *Variophone* and the films of the Italian futurists, who instead used the drawings only for image.



Film still from 1930s *Russian Drawn Sound: Arseny Avraamov's Ornamental Sound Animation*.

Retrieved December 8, 2018, from <https://www.youtube.com/watch?v=8EGFPZdiVqI>

Unlike the previous works, the composer explored the artificial sounds with a more intuitive perspective. By playing with the shapes and the layers, the experimentation conducted also to a visual result that would make the piece a Visual Music film. Even though

²⁶ The Italian futurist Luigi Russolo (1885-1947), considered the first noise artist, wrote manifesto *The Art of Noises* and fabricated between 1910 and 1930 a series of noise machines that he called *Intonarumori*.

these movies appear to be lost, there are some small fragments of a documentation in which Avraamov is seen painting and later projecting part of a film.

Avraamov is mostly famous for his participation in the first artificial soundtrack and the “*Symphony Of Factory Sirens*”, but his work with film and optical synthesis contributes a great deal to Visual Music. If were not for the Second World War, maybe we would still have the *Variophone*, together with a number of animated films and *ornamental sounds* that were sadly destroyed in a Nazi missile attack in Leningrad.

6. Color light instruments

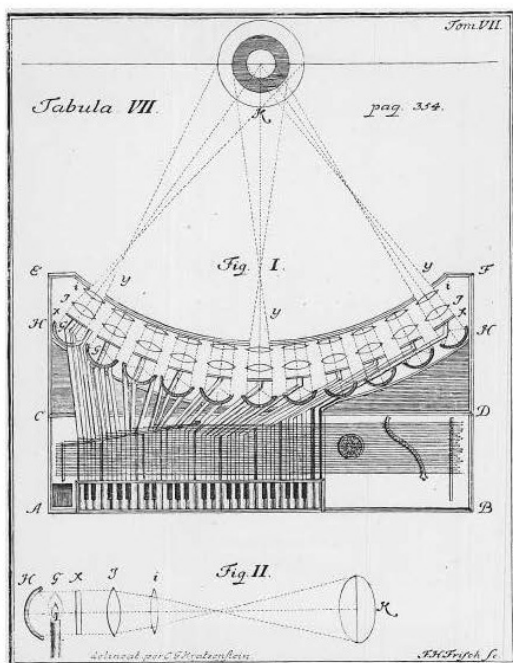
*“In painting, color has been used only as one of the elements in a picture. (...) We have not yet had pictures in which there is neither form nor subject, but only pure color. (...) There has, in fact, been no pure color art (...) The object of the present invention is to lay the first stone towards the building up of such an art in the future.”*²⁷

The idea of building an instrument that would generate color or images became the fantasy of many artists throughout history. It started already in the renaissance with sketches and experiments of scientists, artists and inventors, some of them who are to this day used as inspiration. The list of instruments created since then is exuberant, for which we will not stop to detail each case, and instead focus on just a few.

We have already mentioned the *Ocular Harpsichord* of Castel and some attempts of the Italian futurists and artists in the soviet era (Baranoff-Rossiné’s *Piano Optiphonique* and Sholpo’s *Variophone*). All of these inventions contributed and form an important part in the improvement of a color light instrument, however the apogee will not be reached until the 1910’s and 1920’s with the construction of the *Sarabet* by Mary Hallock-Greenewalt, the *Sonchromatoscope* by Alexander Lászlo, the *Farbenlichtspiele* by the Bauhaus, and others like Fischinger’s *Lumigraph* and Wilfred’s *Clavilux*.²⁸

²⁷ Alexander Wallace Rimington, paper read at St. James’s Hall on June 6, 1895, published in pamphlet form by Messrs. Spottiswoode & Co., New St. Square. June 13, 1895. Klein, A.B. “*Color Music, the Art of Light*”, Lockwood, London, 1930 (p. 256-261) Retrieved January 26, 2019, from Rekveld, J. “*A New Art: Color-Music at light matters.*” http://www.joostrekveld.net/?page_id=185

²⁸ See: Naumann, S. “*Seeing Sound: The short films of Mary Ellen Bute*”. In: Lund, C. & Lund, H. “*Audio. Visual: On visual music and related media*”. Arnoldsche Art, Stuttgart, 2009.



Johann Gottlob Krüger, "De novo musices, quo oculi delectantur, genere" in *Miscellanea Berolinensia, ad incrementum scientiarum ex scriptis Societati Regiae Scientiarum exhibits edita* (1743)

Retrieved November 12, 2018, from <http://imaginaryinstruments.org/ocular-harpsichord/>

6.1 Color-Organ

An early example would be the *Color-Organ* of Alexander Wallace Rimington (1854-1918) presented in 1895 in London. The system of this instrument appeared to be quite similar to the *Ocular Harpsichord*. The mechanism was triggered by a keyboard that produced sound, and mixed color filters in order to have a wider range of hue. In the presentation of the *Color-Organ* he explains: "*I have divided the spectrum band into diatonic intervals or notes, on the same plan as that of the musical scale. These intervals (...) roughly correspond to these carefully calculated intervals or notes of the color octave. You will observe that these points are unequal in distance. This is because the rays of the spectrum are unequally refrangible, but the color notes are, as nearly as can be calculated, separated by equal intervals of vibration. It will be a question of opinion, and of further experiment, whether the close physical analogy between the octaves of color and sound has its physiological and Psychical counter-part.*"²⁹

²⁹ Alexander Wallace Rimington, paper read at St. James's Hall on June 6, 1895, published in pamphlet form by Messrs. Spottiswoode & Co., New St. Square. June 13, 1895. Klein, A.B. "*Color Music, the Art of Light*", Lockwood, London, 1930 (p. 256-261) Retrieved January 26, 2019, from Rekveld, J. "*A New Art: Color-Music at light matters.*" http://www.joostrekveld.net/?page_id=185

In spite of the divided opinions of the public, the *Color-Organ* performed in several concerts during 1895 and it kept on being used in compositions and performances still in the 1910's.

6.2 Clavilux

A few years after the Second Post-Impressionist Exhibition, Thomas Wilfred (1889-1968) would come across the idea of composing light. This outbreking thought would not only successfully merge art and technology but also opens a whole new chapter in art history: the art of light or Lumia.



Elliptical Prelude and Chalice, Unit #50 (1928) by Thomas Wilfred.

Yale University Art Gallery. "*Lumia: Thomas Wilfred and the Art of Light*" (2017). Retrieved February 10, 2019, from <https://artgallery.yale.edu/exhibitions/exhibition/lumia-thomas-wilfred-and-art-light>

In 1919, the danish inventor and musician Thomas Wilfred (1889-1968) invented the *Clavilux*, a keyboard instrument that created and mixed colored light. Its complex mechanism consisted in six projectors, a series of sliders and prisms strategically arranged in function of the light source. Given the lack of popularity that the keyboard *Clavilux* (model A) had, Wilfred carried forward with the creation of a smaller instrument that came with an

internally programmed composition. This home instrument model or *Clavilux Junior*, was sixteen times reproduced, some of them with slight variations. Apart from model A, Wilfred created two other full size *Claviluxi*: Model E and G.

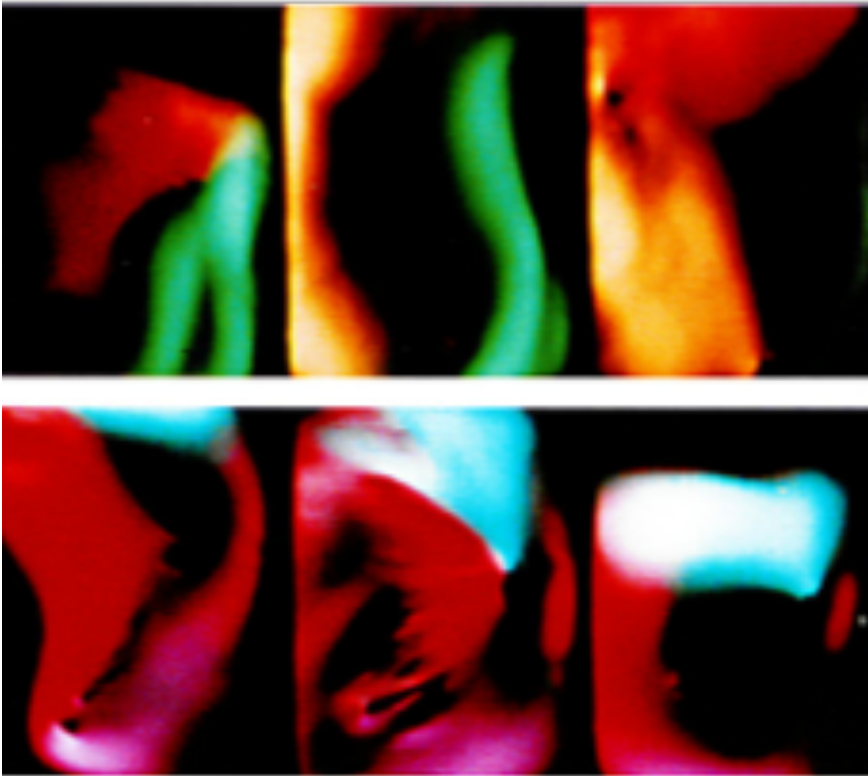
While it is clear that Wilfred was not the first who envisioned a color organ, his machine proved to embed high quality and subtle images that other instruments did not have. He dedicated his life career to the enhancement of the *Clavilux* and the composition of over forty pieces from which only thirteen survived. Most of these pieces were presented in complete silence, since he believed that Lumia should be a silent art.

The Lumia work, inspired several contemporary artists to work exclusively with light, thus marking the beginning of a new form or art: Light Art. With time, light art will make a turn to concern itself mainly with space. But in any case, Wilfred's aesthetic and atmosphere is still printed in the works of the contemporary light artists like Jim Campbell, Robert Irwin and James Turrell.

6.3 Lumigraph

Although most of the color instruments were keyboard instruments, in the late 1940's Oskar Fischinger proposed a device with a simple hand-play mechanism that allowed anyone to create colored light image to music. The *Lumigraph* was made out of changing color filters, projectors, stage spotlights and a large frame and screen, behind which the performer would execute the objects. Fischinger envisioned this instrument to be accessible for everyone, so it could be played at home by children and adults.

The *Lumigraph* was used in the film "*The Time Travelers*" in 1964, but unfortunately the performance was faked and misrepresenting the actual execution of the instrument, to which it was instead called *Lumichord*. The performer, a type of dancer, appears in front of the screen while pretending to interact with a light keyboard, which the *Lumigraph* does not have. Because of this, Elfriede Fischinger, Oskar's wife, kept him from ever watching this film.



Stills from filmed performance of Lumigraph by Elfriede Fischinger, 1969.

Brougher, Mattis, Strick, Wiseman. *Visual Music: Synaesthesia in Art and Music since 1900*. Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005. p. 89

The instrument kept on being displayed and used for performances mainly by his wife Elfriede, his daughter Barbara and film and animation expert specialized in Fischinger William Moritz.

7. The consolidation of visual music tradition and culture

“The art of painting has reached a point where it demands a feasible time element plus plasticity and the medium of light is the next logical step.”³⁰

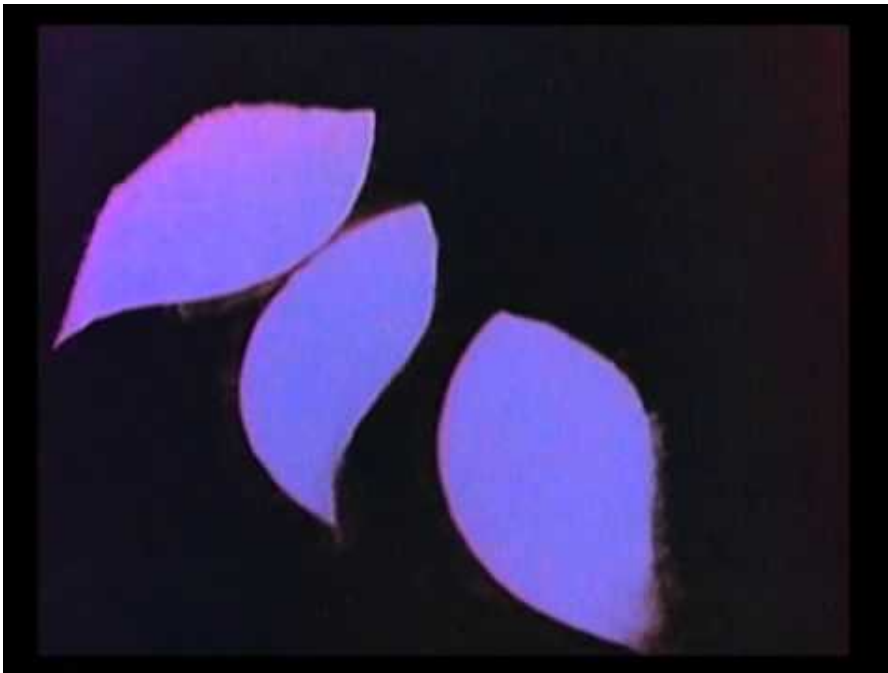
Painting and music had been growing together for some time now and filmmakers after observing this evolution and having developed their own techniques and technologies inquire into visual music with experimental cinema and abstract animation. The contributions of the color light instruments, abstract painting, alongside with the plasticity of time, har-

³⁰ Bute, M. E. *“Light as an Art Material and its Possible Synchronization with Sound”*. Paper read to the New York Musicological Society, January 31, 1932, typescript, New York, 1932, (p.13). In: Lund, C. & Lund, H. *“Audio visual: On visual music and related media”*. Arnoldsche Art, Stuttgart, 2009.

mony and structure of music, appeared to have merged and flourished in film. This would be known as non-objective film.

7.1 The pioneers of non-objective film

During the 1920's, the fever of the avant-garde had already reached cinema with the filmmakers Viking Eggeling (1880-1925), Hans Richter (1888-1976) and Walter Ruttmann (1887-1941). Their connection with abstract art brought ideas of movements like cubism and dadaism to cinema, apace with a premise that searches for an absolute form, analogous to early abstraction and similar to music. With these concepts Eggeling, Richter and Ruttmann founded *Absolute film*, a sub-genre of *Experimental film*, which incidentally overlaps with Visual Music.



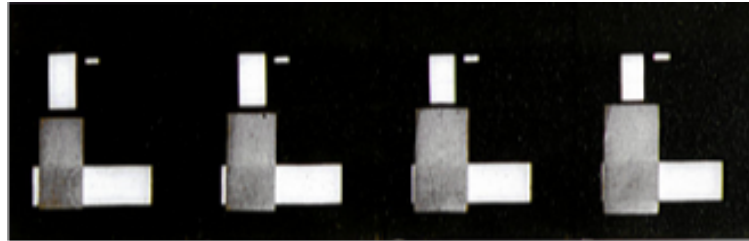
Film still from *Lichtspiel: Opus 1*, 1921 by Walter Ruttmann.

Retrieved February 4, 2019, from Marshall, C. "The First Avant Garde Animation: watch Walter Ruttmann Lichtspiel Opus 1 (1921)". 23 Jun 2017 <http://www.openculture.com/2017/06/the-first-avant-garde-animation-watch-walter-ruttmanns-lichtspiel-opus-1-1921.html>

In 1921 Walter Ruttmann presented in Germany the first abstract animated film, called "*Lichtspiel: Opus I*". The film was accompanied by a live performance of a string quintet with an original score written by his college friend Max Butting. Along followed "*Lichtspiel: Opus II, III and IV*", which were created between 1923 and 1925. The films were made by painting the glass plates of the animation camera thus making frame after frame.

Also in 1921, Hans Richter showed "*Rhythmus 21*", a black and white film that explored a composition with squares and rectangles. Later in 1923 and 1925, the films "*Rhythmus*

23” and “*Rhythmus 25*” were presented continuing the series “*Ist Rhythmus*”. The somewhat minimalistic aesthetic of these films, as opposed to the colorful and organic shapes of Ruttmann’s “*Lichtspiel*”, suggests an ambiguous space that is built and deconstructed by the proportions of the forms and the movement from foreground to background.



Film strip from *Rhythmus 21*, 1921-24 by Hans Richter.

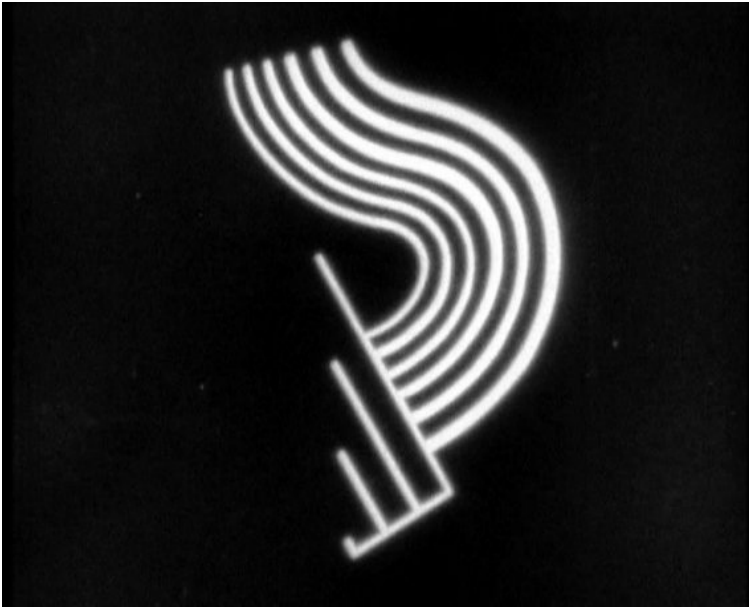
Brougher, Mattis, Strick, Wiseman. “*Visual Music: Synaesthesia in Art and Music since 1900*.” Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005. (p.101)

During the same period, Eggeling started making “*Symphonie diagonale*”, premiered finally in 1924 in Berlin, after being re-shot several times. The technique used was like most animators of the time, to paint and draw directly on the celluloid. Both Richter and Eggeling, used in their films some of the “painting” made in their collaboration, even though the films seem to have kept their own aesthetic and focus. With its strong cubistic influence “*Symphonie diagonale*” was described by the artist and theoretician Frederick Kiesler as “*the best abstract film yet conceived (...) an experiment to discover the basic principles of the organization of time intervals in the film medium*”.³¹

It is important to highlight that the invention of cinema began only a few years before the turn of the century, making much more impressive the quick development of these extended techniques and the results that manifested in such early stage of the history of film.

It was after seeing Ruttmann’s “*Lichtspiel: Opus 1*” that Oskar Fischinger (1900-1967) decided to explore into Visual Music. Coming from music and graphic art, Fischinger found in film the space to combine both and follow his passion for abstract painting.

³¹ Mertins, D. & Jennings, M. W. G: “*An avant-garde journal of art, architecture, design, and film 1923-1926*.” London: Tate Publishing in association with the Getty Research Institute. 2011. (p.64)



Film still from *Symphonie diagonale*, 1924
by Viking Eggeling

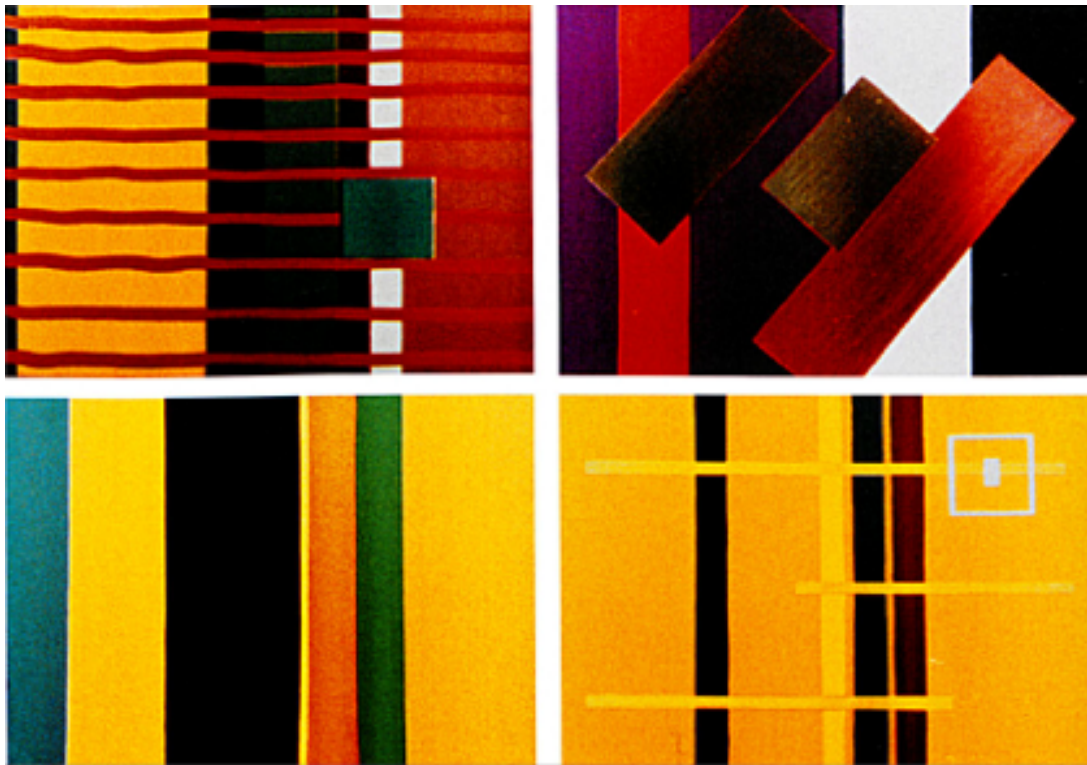
Retrieved February 4, 2019, from <https://www.museoreinasofia.es/coleccion/obra/symphonie-diagonale-sinfonia-diagonal>

He explored various animation and film techniques including the *ornamental sounds* from Avraamov and the invention of some light instruments (previously described). In his early animations, Fischinger experimented with liquids, wax and clay figures, which pointed towards the creation of a wax machine named "*Wax Slicing Machine*". Upon presenting the machine to Ruttmann, it would be utilized to film the background of the animated movie "*The adventures of prince Achmed*" by Lotte Reiniger in 1926.

By 1930, Fischinger had already become one of the pioneers in Experimental Film and Visual Music. His extensive list of works showed an exponential artistic development that grew hand in hand with the technologic progress. His success and fame led him to work with Paramount, MGM and Disney, which he did not find easy to do. These works were accompanied by music of recognized classic composers: "*An Optical Poem*" to Liszt's "*Hungarian Rhapsody No. 2*" (1938), "*Toccata and Fugue*" by Bach for Disney's "*Fantasia*" (1939, incomplete) and "*Motion Painting N°1*" (1947) to Bach's "*Brandenburg Concerto no. 3*", winning with this last one a Grand Prix for Experimental Film in 1949.

After numerous projects and tons of experience in synchronized image and music, the filmmaker created in 1942 a silent piece entitled "*Radio Dynamics*". The idea emerged as a counter proposal to a commission by *The Museum of Non-Objective Painting*, which unfortunately insisted in a film using an American march as music (to prove loyalty to the

country). Fischinger proceeded with the commission and in parallel made for himself the silent film *"Radio Dynamics"*.



Film still from *Radio Dynamics*, 1924 by Oskar Fischinger

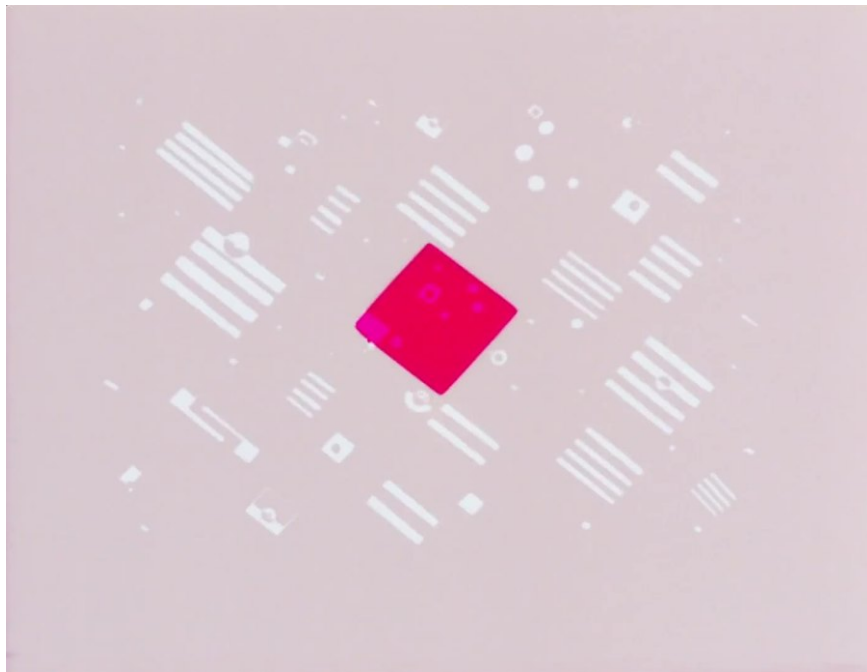
Brougher, Mattis, Strick, Wiseman. *"Visual Music: Synaesthesia in Art and Music since 1900."* Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005.

The abstract forms in play with pictorial elements in a temporary medium, was for many a perfect place to compose movable image in time. *"Through the color organs of Castel and Rimington, Scriabin's Mysterium, to the abstract animated films of Eggeling, Ruttmann, and Fischinger, the Dada/Surrealist "poems" of Man Ray or the Satie-Picabia-Clair Entr'acte, or the equally "Surrealist" films of Len Lye"*³², visual music had built a tradition that would continue to develop strongly in the coming years. For Mary Ellen Bute, after having gone through abstract painting and shortly engaged with color light instruments, visual music would not only become the most suitable medium for her work, but also would open the doors for her to expand the ideas of cinema.

³² Moritz, W. *"Enlightenment"*. 1998. In: Haller, R. *"First Light"*, New York: Anthology Film Archives, 1998. Retrieved February 24, 2019, from Center for visual music, <http://www.centerforvisualmusic.org/WMEEnlightenment.html>

Mary Ellen Bute (1906-1983) was a video artist and animator, whose work derives from the need of the time element in painting. Her love of music and the inspiring work of Wilfred and Fischinger, led her to extensive research and experimentation with video and animation. She presented her first abstract animated film in 1934. *"Rhythm in Light"* was constructed over the music of Edvard Grieg's *"Peer Gynt Suite"*, and was made out of hand cut geometric figures. The abstract sequences were created by changing the video speed and using out of focus effects on images of various objects and materials like cellophane, plastic, and paper.

Bute's idea of finding a visual imaginary corresponding to music, persisted in the works that followed. The aim was to create a musically organized visual composition through an abstract play of light and shadow, and the priority remained on deriving principles from music to color, form and movement.³³



Film still from *Tarantella* (1941) by Mary Ellen Bute.

Retrieved December 2, 2018, from Flicker Alley (Ed.) *"Tarantella"*. <http://www.fandor.com/films/tarantella>

Throughout the years, Bute's use of effects, color, light, and camera techniques became more and more elaborated, resulting in her most famous film *"Tarantella"* (1941) in direct collaboration with the composer Edwin Gerschefski. In this collaboration, Bute was able to

³³ Further analysis can be found in: Naumann, S. *"Seeing Sound: The short films of Mary Ellen Bute"*. In: Lund, C. & Lund, H. *"Audio. Visual: On visual music and related media"*. Arnoldsche Art, Stuttgart, 2009.

contribute musically, using the rhythmic patterns present in the visual compositions. These rhythmic ideas, were translated to music by Gerschefski who wrote the music especially for the film. Although this is one of her most famous pieces, Bute's work is usually built on music of composers like Liszt, Saint-Saëns, Bach, Wagner, Shostakovich, Copland and Rimsky-Korsakov.

Bute's work represents the link between the avant-garde of the 1920's and early media art.³⁴ Her connections and collaborations with pioneers of electronic music, such as Theremin, and experimental filmmakers, as well as her halfway position in the mainstream and the underground, made an exotic combination that brought the techniques of the avant-garde to the masses.

Bute's creation of the firm "*Expanding Cinema*" consolidated a practice and marked the beginning of the new movement *Expanded Cinema*.³⁵

Norman McLaren (1914-1987) was a Scottish Canadian filmmaker and animator, whose thorough exploration of image, color and sound left a print in cinema and Visual Music. Unlike the animators that followed the legacy line of Ruttman, Fischinger and Bute, McLaren did not restrict himself to work only with abstract film. Instead, he fused experimental and avant-garde film into the tradition of animated effects and techniques.

At the very beginning of his career in 1934, exposed to the works of the Russian filmmakers Eisenstein and Pudovkin, McLaren discovered the immense capacity for artistic expression contained in the medium in contrary from the idea of cinema as a form of entertainment. And soon enough, he jumped into the exploration of the already known animation techniques of painting on the film and scratching the optical sound part.³⁶ While the techniques were not entirely McLaren's invention, he is admitted to be the main developer of them.

³⁴ See: Naumann, S. "*Seeing Sound: The short films of Mary Ellen Bute*". In: Lund, C. & Lund, H. "*Audio. Visual: On visual music and related media*". Arnoldsche Art, Stuttgart, 2009. (p.40-54.)

³⁵ See: Naumann, S. "*Seeing Sound: The short films of Mary Ellen Bute*". In: Lund, C. & Lund, H. "*Audio. Visual: On visual music and related media*". Arnoldsche Art, Stuttgart, 2009. (p.40-54.)

³⁶ Optical sound: sound recorded in the form of a photographic image on cinematograph films. Retrieved February 10, 2019, from <https://www.collinsdictionary.com/dictionary/english/optical-sound>

In the short film *"Canon"*, McLaren explores the musical form *"through a combination of animation and live action, this lively musical film demonstrates, without dialogue, the many patterns that a canon can take depending on the number of participants and the length of the piece of music in question."*³⁷ Of course, considering that most of the definitions of visual music make emphasis in abstraction, the presence of an actor may question whether the piece is visual music or not. Regardless of this, one cannot but recognize the witty talent of McLaren when he takes this musical structure and translate it into film in such a simple and elegant way. And, either way, it is clear that the music is the ground and inspiration of this and the majority of his films.



Film still from *Canon* (1964) by Norman McLaren

Retrieved February 19, 2019, from National Film Board of Canada <https://www.nfb.ca/film/canon/>

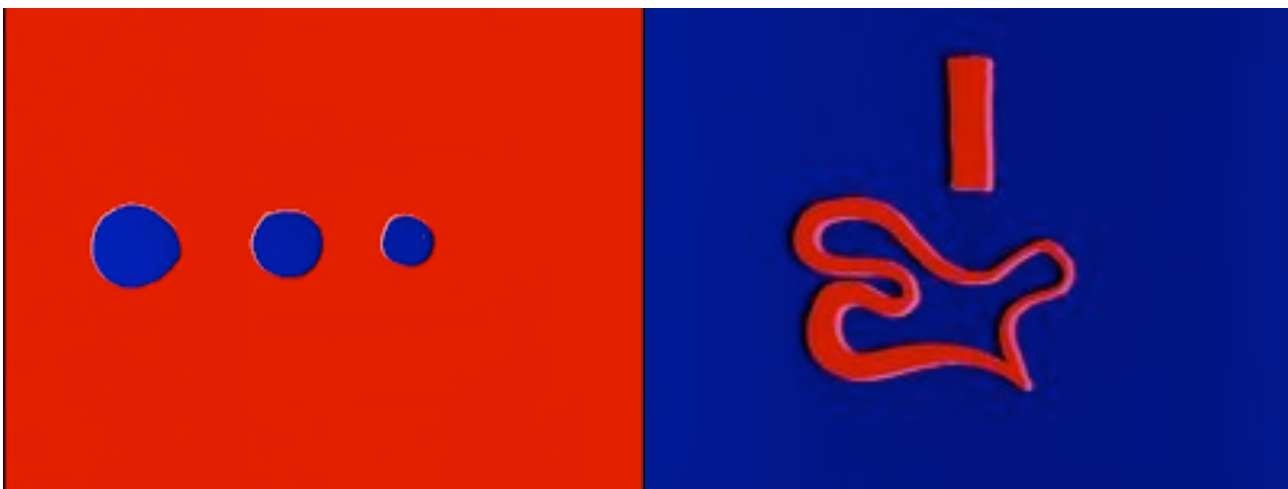
McLaren was not afraid of using figurative and narrative elements in his pieces, which Bute and many others strongly rejected, stressing that *"the corresponding effect on the visual sense was only possible with the help of abstract form, because this, in contrast to representative symbol, is aimed not at the intellect but rather directly at the emotions."*³⁸ At the same time, by not having the standpoint of abstraction, he had freedom to explore with other aspects of film, which led, for example, to the invention of the pixilation technique, similar to stop motion but using actors instead of objects or puppets. These tech-

³⁷ National Film Board of Canada. *"Canon"*, 1964. Retrieved February 19, 2019, from <https://www.nfb.ca/film/canon/>

³⁸ Naumann, S. *"Seeing Sound: The short films of Mary Ellen Bute."* In: Lund, C. & Lund, H. *"Audio. Visual: On visual music and related media"*. Arnoldsche Art, Stuttgart, 2009. (p.50).

niques would become key for the animation industry and the visual effects that now are so commonly used in cinema.

Apart from his more figurative and narrative films, McLaren dedicated a large part of his work to a series of hand painted color pieces. In these films he works with jazz, classical music and with own compositions made with the technique of scratching the optical sound area. Some of the most outstanding films are “*Dots*”, “*Synchromy*” and “*Loops*”. These pieces integrate the abstraction and aesthetics of the early visual music films and the sound production techniques of the firsts synthetic sounds that come from the work of Avraamov, Alexander Shorin and Evgeny Sholpo.



Film still from *Dots* (1940) by Norman McLaren.
McLaren, N. (2011, November 24). *Dots* (1940).
Retrieved February 24, 2019,
from <https://vimeo.com/32645760>

Film still from *Loops* (1940) by Norman McLaren.
McLaren, N. (2011, November 24). *Loops* (1940).
Retrieved February 24, 2019,
from <https://vimeo.com/32646107>

7.2 The second generation of non-objective film

The 1950's were marked by the post-war trauma and a space and nuclear competition between the two world powers: United States and Soviet Union. “*Art of the 1950s was one of the battlefields for the ultimate and long-lasting victory of communism or capitalism*”³⁹ which would be later strongly criticized by the artists of the 1960's and 1970's. Although there were some new movements during this period, there was basically an echo of the avant-garde of the beginning of the century. The last half of the century can be seen as a

³⁹ Maria, R. “*The Story of 1950s Art.*” 9, Nov 2016. Retrieved February 23, 2019, from <https://www.widewall-s.ch/1950s-art/>

time of recovery and reflection, where the ideas of the avant-garde were implemented and used to create the new artistic currents.

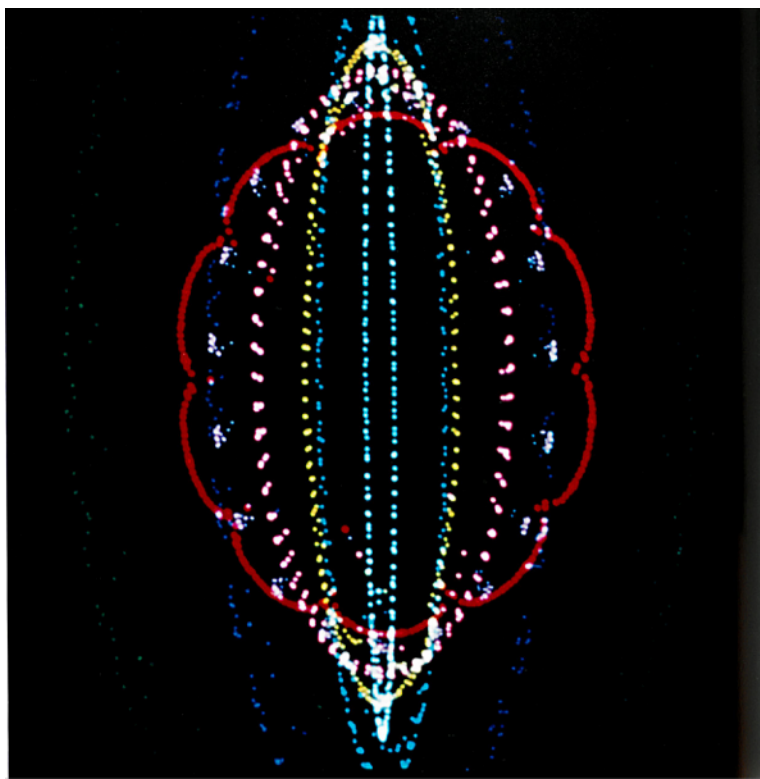
The *Art in Cinema festival* at the San Francisco Museum of Art in 1946, inspired young filmmakers to pursue abstract animation and visual music. The exposure to Fischinger's, Ruttmann's and Len Lye's work would be known as the *second generation of non-objective film* formed by the Whitney brothers, Harry Smith and Jordan Belson.

John Whitney (1917-1995), American inventor, animator and composer, took the benefits of the technology advances to build a mechanical analog computer in the late 1950's. This machine allowed him to create geometric forms and patterns that were animated "*in precise orbits at independent rates and directions.*"⁴⁰ The search of a complementary interaction of sound and image was important part of the creation of the films, which engaged Whitney with the composition of the music. After being exposed to the dodecaphonic pieces of Schoenberg, he based some of the early films on serial principles. He linked the mathematical procedures of music composition to visual components. As a result, most of the shapes respond to symmetric patterns and geometric shapes that were gradually transformed in the exploration of three-dimensional movements. At first, the sounds were produced with a homemade pendulum soundtrack device that would later lead to the exploration of sine wave polyphonies. The digital pixel and the digital audio sine wave were the basic elements of image and sound respectively. These units would conform the ground for the development of the pieces.

Unlike the first generation of non-objective filmmakers, Whitney actively concerned about the state of the arts of various disciplines of modernity: Bauhaus, Schoenberg's new music school, contemporary mathematical and philosophic ideas, etc. These were great tools for the graphic visual design, the music composition and the construction of the devices. Whitney is considered one of the fathers of computer animation and music. Aside of his films and the invention of the mechanical analog computer, he went on to develop "*a com-*

⁴⁰ Whitney, J. Sr. "*Notes on Permutations*", 1972. Film Culture No. 53-54-55. Spring, 1972, (p.78). Retrieved February 23, 2019, from. <http://www.centerforvisualmusic.org/WhitneyNotesPerm.htm>

*puterized instrument on which one could compose visual and musical output simultaneously in real time.”*⁴¹



Film still from *Permutations* (1968)
by John Whitney

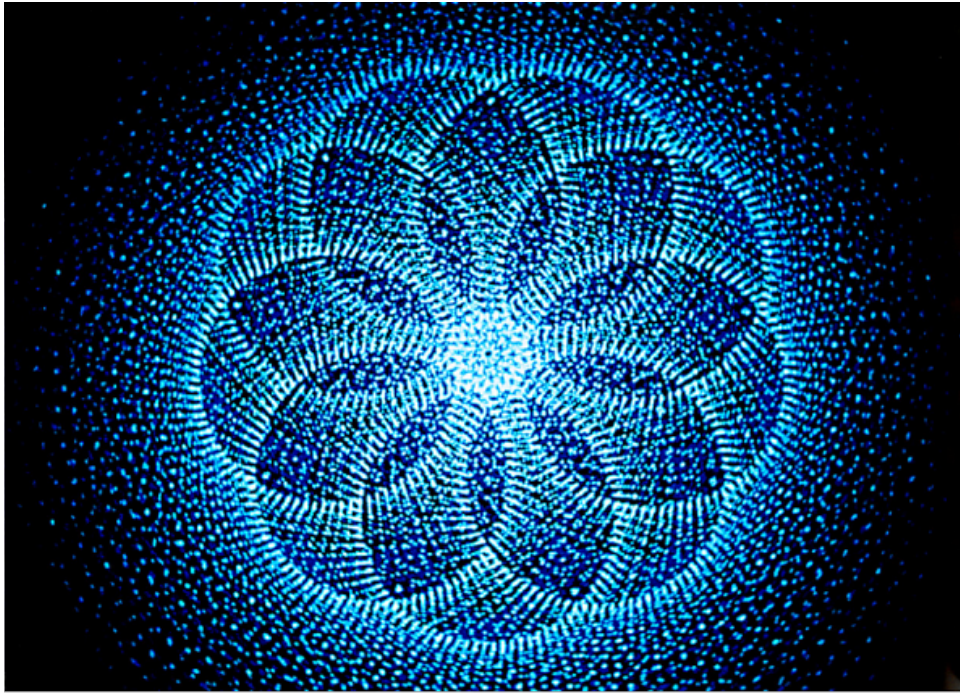
Brougher, Mattis, Strick, Wiseman. *Visual Music: Synaesthesia in Art and Music since 1900*. Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005.

On the other side, James Whitney (1921-1982), John's younger brother, dedicated entirely to film. His spiritual and mystical interest, especially in oriental philosophies, influenced his aesthetics and the line of work that he developed entirely by hand. During his four decades career he only made seven films alone, plus three others with John.

One of these collaborations, *"Film Exercises"* (1943-1944), was particularly groundbreaking for soundtrack, winning them a grand prize at the 1949 Brussels Experimental Film Competition: *"At that time, before the perfection of recording tape, these sounds, with exotic "pure" tone qualities, mathematically even chromatic glissandos and reverberating pulsations —were truly revolutionary and shocking."*⁴²

⁴¹ Moritz, W. *"Digital Harmony: The Life of John Whitney, Computer Animation Pioneer."* Animation World Magazine, Issue 2.5. Aug, 1997. Retrieved February 23, 2019, from <https://www.awn.com/mag/issue2.5/2.5-pages/2.5moritzwhitney.html>

⁴² Moritz, W. *"Enlightenment"*. In: Haller, R. *"First Light"*, New York: Anthology Film Archives, 1998. Retrieved February 24, 2019, from <http://www.centerforvisualmusic.org/WMEenlightenment.html>



Film still from *Lapis* by James Whitney.

Brougher, Mattis, Strick, Wiseman. *Visual Music: Synaesthesia in Art and Music since 1900*. Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005.

James Whitney belonged to the *Beat Generation* of the 1950's, a line of artists that rejected the traditional values of the American culture and were deeply devoted to the exploration of spiritual eastern religions as well as other psychedelic and mystical experiments. The next generation of the 1960's would take a lot of these ideas to the hippie movement.

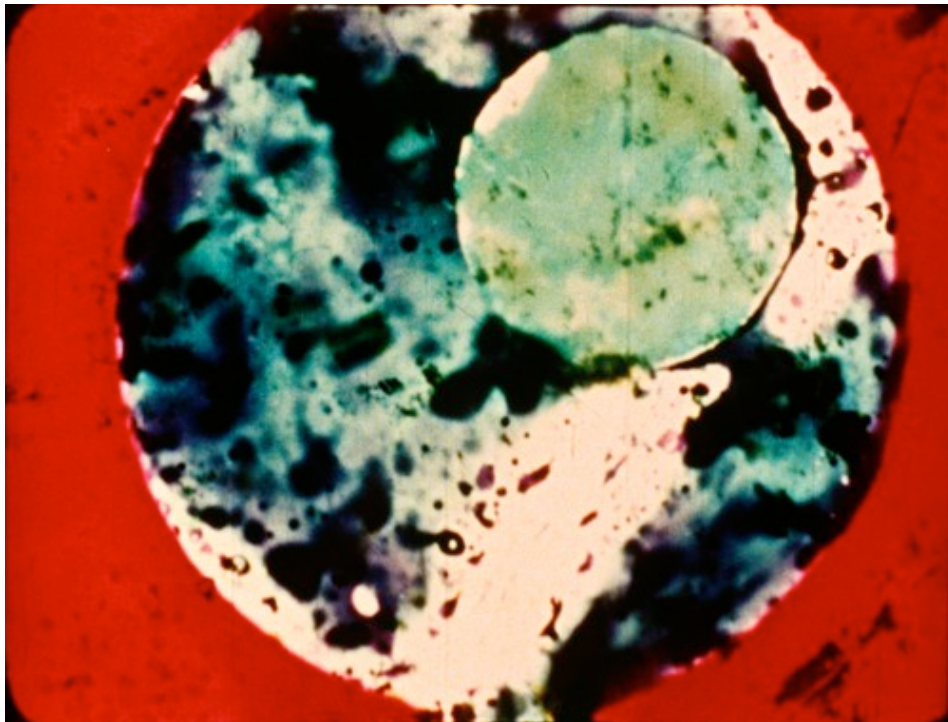
The American filmmaker Jordan Belson (1926-2011) also pointed towards a spiritual visual music. He explored with scroll painting and traditional techniques of animation while taking his inspirations in mandalas, mysticism and astronomy. His filmography, over thirty films, is at time called cosmic cinema.⁴³

Given his long career (approximately six decades) his work has been shown recurrently next to the ones of Fischinger, McLaren, Ruttmann and Richter, his main influences. Belson has participated in the main exhibitions and research of the 21st century and has been represented by the Center for Visual Music (CVM), which is still now actively maintaining

⁴³ See: Stein, S. (2010, October 12). "Cindy Keefe on Jordan Belson, Cosmic Cinema, and the San Francisco Museum of Art." Retrieved February 25, 2019, from <https://openspace.sfmoma.org/2010/10/jordan-belson/>

the visual music legacy through the preservation, investigation and digitalization of the pieces.

Harry Smith (1923-1991) appeared as an important figure to the Beat Generation in New York. In addition to filmmaking and painting, Smith inquired into musicology with his research in American folk music. He was strongly inspired by Bebop and the jazz scene, which he came to know closely as he lived over the club *Jackson's Nook*. The nightlife, the use of drugs, the music, light, and the mystical quests, motivated him to do a series of art experiments including visual music films that were of course accompanied by jazz.



Film still from *Early abstractions* (1946) by Harry Smith

Film Makerscoop. *Early Abstractions* 1946. Retrieved February 25, 2019, from <http://film-makerscoop.com/catalogue/harry-smith-early-abstractions/stills/1>

The mystical and meditative aim of Smith's, Belson's and Whitney's pieces, would be later the predominant idea of visual music in the popular culture. This aesthetic is also taken by the music visualizer software of nowadays —that generates the images in reaction to the music one chooses— and to the psychedelic light shows of the 1970's.

8. New perspectives in new music

The synesthetic composer Oliver Messiaen (1908-1992), appears as one of the greatest figures in music of the 20th century. Messiaen's music gathers the influences of complex rhythms of ancient Greece and India, together with a harmonic and melodic base that he himself developed. He imagined colors for each of the chords and sounds of his music, which he communicated to the performer *"by spelling out in words in his scores the precise colors he envisaged."*⁴⁴ The color-sound connection is key for the appreciation of his music and to understand the sensory sensitivity that extended in the following generations.

While it is true that Messiaen composed from synesthesia, he did not develop his work in visual music. Possibly because the colors he envisioned were already present in the sounds. But this idea of color in sound transformed the way of listening and opened sound to subtleties that were before unseen. This approach stayed with his students, who then would also become great contributors to the music: Karlheinz Stockhausen (1928-2001) and Pierre Boulez (1925-2016).

For some artists like John Cage (1912-1992), the 1950's would be defining for his career, a period of deep philosophical and artistic incursion that would build the ground for the next artistic phase. From a musical exploration of form, composition and extended techniques, Cage brought the attention back to the act of listening —listening with the senses instead of the brain. This major contribution *"shifted the focus away from the artist's inner psyche to the artist's contemporary environment."*⁴⁵

Cage's conceptions would open the space for the next generations of composers that were already evolving from serialism (initiated primarily by Arnold Schoenberg) to an expansion of composition that embraced dadaism, surrealism and incorporated theatrical and visual elements. Such composers like Mauricio Kagel (1931-2008), would take a step forward in the exploration of form and the disruption of the musical language with new music-theater.

⁴⁴ Brown, G. *"How Olivier Messiaen heard in color"*. 25, Jan 2008. Retrieved February 26, 2019, from <http://www.rowan-hull.com/the-man-who-heard-colour/>

⁴⁵ Zurakhinsky, M. *John Cage Art, Bio, Ideas*. Retrieved February 23, 2019, from https://www.theartstory.org/artist-cage-john.htm#key_ideas_header

Taking into account that neither Cage nor Kagel were working on visual music, the ideas behind their philosophies contemplated visual music aspects, like for example, color-tone. John Cage dabbled in graphic notation, using drawing and color to provide extra information to the performer.⁴⁶ Although, a link between visual music and graphic notation could be created, the notation has the purpose of instructing the interpreter to produce sound. The notation is not the piece, thus, it is not really visual music. Still, the line between music notation and visual music, is constantly moving depending on the specific case. Cage's relevance to visual music is not based on his work with graphic notation, but in the paradigm shift that would influence many composers and artists in the future.⁴⁷

In Kagel's work, which included film and performances with actors and unconventional use of instrument and objects, *"color and light would not serve to illustrate the music more than the music served to comment on the drama—all would rest precisely on the action common among all elements."*⁴⁸ These ideas were consequently incorporated in his artistic practices.

9. Silence as platform for musical experience

Both music and arts have used silence as a statement, but in some cases, silence has become a manifestation of a point zero, a return to the basics and most essential. Considering this idea, it is not surprising that several of the visual music artists that had worked for many years synchronizing music to their films, had at some point the need to compose a silent piece. This phenomenon has not being closely looked at in visual music for which I hope these few examples open the question to some researchers and artists.

9.1 Silent music

Since music is built on sound, the role of silence in a music composition consists usually on increasing and releasing tension but also on separating sections. It is actually through silence that we can recognize a structure, as it marks the end of a movement and the be-

⁴⁶ See: Cage, J. *"Aria"* (1958).

⁴⁷ See: Cage, J. (2011). *"Silence: lectures and writings"*. Wesleyan University Press.

⁴⁸ Laskewicz, Z. *"The New Music-Theatre of Mauricio Kagel."* May 2008. Retrieved February 23, 2019, from http://www.nachtschimmen.eu/zachar/writer/9204_KAG.htm#_ftn5

ginning of another. This is key for the communication between audience and musicians. Only when the audience is completely quiet, the musicians can start playing. And vice versa, when the musicians are finished, they hold the pause and then release giving the cue to the audience to clap and close the circle of the concert ritual. A pause provides as well information about the interpretation of the piece. A musician can organize the phrase, give emphasis in specific moments and change the character of the interpretation, thanks to these particular pauses. But this dynamic belongs to a hierarchical organization of things that respond to the values and aspirations of the western mentality. In music, "*western society dictated that things happening at the "center" of an orchestra concert were inherently more important than things happening in the audience.*"⁴⁹ Now, with time the composers have dared to disrupt this traditional order by confronting it directly and putting it in the artwork. Silence remains one of the most controversial and misinterpreted topics.

Even though *silent music* has been existing already some centuries ago (thinking on the silent pieces of visual music and some religious silent music of the renaissance⁵⁰), the preconceived expectations of the centralist normative of the concert together with the fix notion "*that music was made by musicians using traditional instruments to perform structured and prearranged compositions*",⁵¹ still prevails over the idea of silence as platform for a musical experience. In consequence, the works that introduce silence as a key factor in the piece are usually destined to be misread or misunderstood. Such are the cases of "*Silent Music*" (1941) by Raymond Scott's (1908-1994) and the later "*4'33*" (1952) by John Cage (1912-1992).

Scott's piece can only be imagined through the brief description of a *Time magazine* reporter in 1941, who wrote: "*The band was going through all the motions: the swart, longish-haired leader led away; the brasses, the saxophones, the clarinets made a great show of fingering and blowing. This, explained leader Raymond Scott, was silent music.*"⁵²

⁴⁹ Dacey, J. "*I have nothing to say and I'm saying it...: John Cage Defined in the 1950s*". 2004. Retrieved February 23, 2019, from <http://www.plosin.com/beatbegins/projects/dacey.html>

⁵⁰ See: Shephard, T., Ștefănescu, L., & Sessini, S. "*Music, Silence, and the Senses in a Late Fifteenth-Century Book of Hours*". *Renaissance Quarterly*, 2017. (p.489–507)

⁵¹ Zurakhinsky, M. "*John Cage Art, Bio, Ideas*". Retrieved February 23, 2019, from https://www.theartstory.org/artist-cage-john.htm#key_ideas_header

⁵² Times Magazine. "*Music: Silent Music.*" 3, Mar 1941. Retrieved February 12, 2019, from <http://content.time.com/time/magazine/article/0,9171,851092,00.html>

Raymond Scott, who was mostly composing for Warner Brothers, appears to have given up on the idea, leaving no recording or documentation of the piece. If were not for this critic, we would maybe not even know of its existence and Cage would have been the first to fall on deaf ears.

Later in 1952, after suffering the audience's giggles and laughs at the premiere of 4'33, the composer confessed: *"They missed the point. There's no such thing as silence. What they thought was silence, because they didn't know how to listen, was full of accidental sounds."*⁵³ Indeed, the question of silence arises almost in any silent piece, for the experience of it is rarely perceived in awareness and when realized, it is usually interrupted under the common social judgement of "awkward silence". Now, having multiple books, articles and blogs, not to mention the extensive amount of quotes and reference to the piece, silent music (and prolonged silence) continues to be somehow controversial and un-comprehended.

It has been now explained that silence can have many meanings depending on the purpose, context, and format of the piece. For the radical 4'33, it was clearly *"an act of framing, of enclosing environmental and unintended sounds in a moment of attention in order to open the mind to the fact that all sounds are music."*⁵⁴ But in the case of Scott's 13-piece orchestra, it was a music expressed through actions and movement, leaving it all to the imagination and engagement of the audience. This is a great example of a music composed on the idea of the inner-sound — a sequence of gestures of simultaneous or single individuals that delivered altogether a silent visual music.

9.2 Silent visual music

Silent visual music has been briefly mentioned in more than one review and article, usually as a poetic conclusion of a study case, never the less, there are no focused studies about it and no real acknowledgement of these pieces. The already paradoxical concept of music in silence, silence as music and other related philosophical-artistic questions (con-

⁵³ Cage, J. "4'33". Edition Peters. 1952. Retrieved February 12, 2019, from <https://www.edition-peters.com/product/433/ep6777c>

⁵⁴ Gann, Kyle. "No Such Thing as Silence". Yale University Press, 2011. In: Robson, D. "Culture - The mysterious appeal of 'silent music'." 2016. Retrieved February 12, 2019 from <http://www.bbc.com/culture/story/20160323-the-mysterious-appeal-of-silent-music>

flicts that rise from silent music alone), make even more complex the topic of *silent visual music*. To unravel this, it would be necessary to dedicate a research that focuses entirely on the subject. For the purposes of this research, I will just mention a few examples of *silent visual music*, acknowledging this practice as a branch of visual music.

9.2.1 The silent Lumia of Thomas Wilfred

The invention of the Clavilux in 1919 came hand in hand with the emergence of the art of Lumia. Wilfred's idea was perhaps too advanced for his time—even nowadays, it seems to be misunderstood and not entirely appreciated—but thanks to his persistency and enormous dedication, his work is being rescued, rediscovered and reconsidered. It appears to be that the Lumia pieces were the beginning of silent visual music, a small and evidently little known current that somehow managed to go under the radar even during the most strange and schizophrenic moments of arts and music history.

As most light artists, Wilfred came from the musical realm and as it usually happens with former musicians, this background appears in the work, even if the subject is not about music, or has anything to do with sound. It manifests itself in the subtleties, the characteristic development of temporality, the essence and atmosphere that creates, or in the compositional approach. It is not just in the titles of his pieces, (*“Elliptical Prelude and Chalice”*, *“Lumia Suite”* or *“Nocturne”*, to mention a few), added to the fact that all the works of Wilfred are organized and numbered by Opus⁵⁵, but also in the evident implied musicality of the pieces. The delicate strokes of light that create at times counterpoints that slowly change their form until resolving together in a tonic. In other moments, the thick harmonies appeared in masses of color, which move from one chord to the other like a choral. Sometimes these condense stains work as a ground for a subtle thin ephemeral shape to float, resembling a shy melody. In the words of *The New York Times Magazine*: *“Wilfred could organize a Lumia composition as carefully as any musician ever organized a symphony, translating the musical elements of tempo, rhythm, key, theme, and contrapuntal structure into colors that rise, fall, blend, separate, fade, glow, and reshape them-*

⁵⁵ Opus: a musical composition or set of compositions usually numbered in the order of its issue. *“Opus.” Merriam-Webster*, Merriam-Webster, Retrieved February 12, 2019, from www.merriam-webster.com/dictionary/opus.

selves according to plan."⁵⁶ Unfortunately, in the same publication, the reporter questions the silent factor of the pieces and suggests the inclusion of sound (not music) to the Lumia. In my opinion, this proposal would not only distract from the actual composition that Wilfred carefully made, but it would also disallow the audience to experience a truly subjective music, one that is triggered by what is seen and heard only in the individuality of the imagination: the inner-sounds.



Unit #86, Clavilux Junior (1930) by Thomas Wilfred.

Carol and Eugene Epstein Collection.

"Lumia: Thomas Wilfred and the Art of Light" (2017).

Retrieved February 10, 2019, from <https://art-gallery.yale.edu/exhibitions/exhibition/lumia-thomas-wilfred-and-art-light>

Thomas Wilfred was known to be a reserved and perfectionist man, to which the mysterious quality of his works fit not only to his personality but to the evanescent essence of light. The visitors usually enter this silent and dark atmosphere with no previous knowledge of the work or the artist, only to be confronted with the delicate and subtle Lumia that grants little or no information, but somehow contains and supports itself as a pure art work, which was what Wilfred wanted: a self-sufficient art. I find in this a direct link with absolute music, music that is not about anything else but itself—a close circuit that refers to itself and manifests in the simplicity of its own form. Now, what is interesting is that within this purity, Wilfred is reaching multiple arts and discourses. Starting with the presentation of the

⁵⁶ Canaday, John. "Art: Thomas Wilfred and his persistent Clavilux". The New York Times, 22, Aug 1971. Retrieved February 12, 2019, from <https://www.nytimes.com/1971/08/22/archives/thomas-wilfred-and-his-persistent-clavilux.html>

work, a silent and dark space, both being synonyms of image and sound, to the use of technology in service of the arts, which would be later an own genre. But Wilfred, I assume without any ambition of being a pioneer or breaking through the normative of art history, does not categorize his work. Instead he continues composing light and calling it by his own criteria: Lumia.

9.2.2 Silent visual music films

The pioneers of visual music have been mainly acclaimed for their contributions to film and interdisciplinary art. But while the analysis of their works is based on special techniques and a pronounced correlation between music and sound, the silent works of these artists remain overlooked.

In film, the element of silence is usually included in the description of a piece together with the technical features, to which, it is frequently understood as an aspect of secondary order. Due to this —or perhaps because it is often misinterpreted or linked to a technicality— silent visual music has not been properly investigated, nor observed as a particular and recurrent phenomenon of visual music. Although the visual music pieces that intentionally use silence are very few, they are also not entirely insignificant. They emerge, apparently from a common personal need of change after having worked for long periods of time with synchronized visualization of music. These are the cases of the previously mentioned *“Radio Dynamics”* and *“Spirals”* by Fischinger.

“Radio Dynamics” has been considered *“Fischinger’s best film, the work in which he most perfectly joined his craftsmanship with his spiritual ideas into a meaningful and relatively faultless whole.”*⁵⁷ The intentional silence, which is specifically stipulated in the first frames, provides key information on how to approach the film. The images that Fischinger presents have an independent intention and are not to be restricted by pre-conceived music. In fact, the point of the piece has nothing to do with music. On the contrary, it is connected to a spiritual aim, to reach a *“psychological effect throughout is pleasurable”*. As he mentioned in a letter before the film was even finished: *“The Static, the passive observa-*

⁵⁷ Moritz, W. “CVM’s Oskar Fischinger pages: Film Notes, Film Reviews by others.” Retrieved February 22, 2019, from <http://www.centerforvisualmusic.org/Fischinger/CVMFilmNotes2.htm>

*tions of former color science, will be superseded by the Dynamic. This step corresponds to penetrating from the surface into the depths.”*⁵⁸

The Whitney brother's film *“Twenty-Four Variations on an Original Theme”*, which was based on Schoenberg's serialist theories, was also conceived in silence. Like Wilfred's works, the visual composition responds to a musical structure, that in this case suits to the musical ideas of the modernity: *“the silent images performed a cogent dynamic on their own, and the intimate format of the film gave the feel of exquisite chamber music.”*⁵⁹

The intentional use of silence in the visual music films -from this are excluded the silent films of the beginning of the century, which were usually thought to be played with live music- continues to be an unresolved paradox for many, although even now, some artists insist on exploring the silent visual connection. It would be interesting to inquiry more deeply into this particular phenomenon: why do artists and musicians seek silence to express music? Is there perhaps a kind of music that can only exist in silence?

10. The pre-digital era

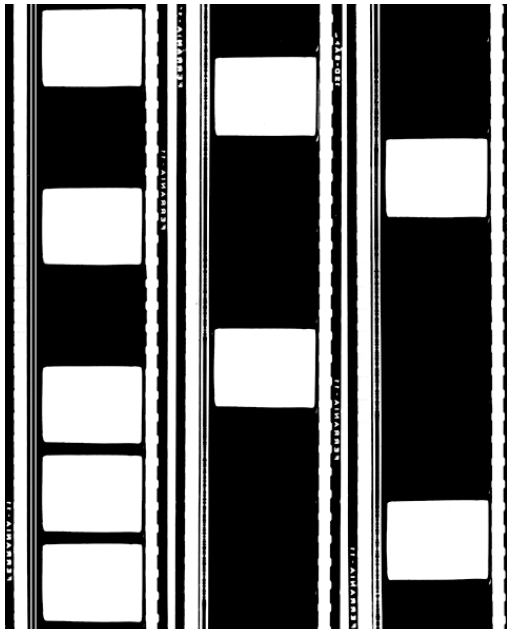
The pre-digital era was maybe the most ambivalent of times for the arts. Filled with “neo” art movements and structured ideologic positions (Neo-Conceptualism and Neo-Expressionism as main opposing forces), the artists were now more focused on portraying their viewpoints than in the creating art for the sake of the arts. In spite of this, the way these ideas manifested in arts and music were at this point pretty much interlaced. Accordingly, there are quite a few similarities between the works of composers and artists. The resulting pieces proposed a different perspective to the image sound relation.

The Austrian filmmaker, architect and musician Peter Kubelka (*1934) amazed the art world in 1960 with his flicker film *“Arnulf Rainer”*. The film alternates clear and black frames creating a contrapuntal dialectic with the interrupted white noise sound. It is built on the dialogue of the visual and sound rhythms. The film enables visual music to develop

⁵⁸ Fischinger, O. *“from a letter to Hilla Rebay”*. 18, Aug 1940. <http://www.centerforvisualmusic.org/Fischinger/OFFilmnotes.htm>

⁵⁹ Moritz, W. *“Enlightenment”*. In: Haller, R. *“First Light”*, New York: Anthology Film Archives, 1998. Retrieved February 24, 2019, from <http://www.centerforvisualmusic.org/WMEenlightenment.html>

image and sound simultaneously and independently. It introduces a different way of approaching this link, in which image and sound are not reactionary to each other but produce a counterpoint in their interaction. Kubelka was one of the fathers of structural film, a movement that would develop through the 1960's.



Film strip from *Arnulf Rainer* (1960)
Peter Kubelka

Grisseemann, S. "*Frame by Frame: Peter Kubelka*". Film Society of Lincoln Center. Sept 2012. Retrieved February 23, 2019, from <https://www.filmcomment.com/article/peter-kubelka-frame-by-frame-an-tiphon-adebar-arnulf-rainer/>

Light and sound installations were appearing in the artwork of composers and artists all over. Greek composer and architect Iannis Xenakis (1922-2001), presented between 1967-1974, his *Polytope* installations, "*that used hundreds of loudspeakers, lasers and pulsing lights in architectural settings.*"⁶⁰ During the same time, John Cage (1912-1992) composed "*HPSCHD*" (1969), for seven amplified harpsichords, two thousand slides and one hundred films. Stephen Beck's (*1950) "*Illuminated Music*" performances between 1971-1972, —"*considered a form of "visual jazz"*"⁶¹— would be shown through the 1990's and into the 2000's.

Several artists and composers transport visual music to sound and visual installations, light show performances and video art. The 1970's started with a forward thinking that rested on inter-media art, installation and performance explorations and the new digitalization and motion graphics technologies in real time.

⁶⁰ Brougher, Mattis, Strick, Wiseman. "*Visual Music: Synaesthesia in Art and Music since 1900.*" Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005. (p. 170)

⁶¹ Beck, S. "*Illuminated Music*". 2007. Retrieved February 26, 2019, from <http://www.stevebeck.tv/ill.htm>

Into the 1980's and 1990's, visual music had moved from experimental cinema with instrumental and mostly classical music, to trans-media art and electronic music. The hype of the video and sound synthesis, the rise electronics and the strong predominance of conceptual ideas —mainly rejecting political and social behaviors— put visual music in second or even third order of importance. The artworks that were in part visual music pieces were bond to ideological statements and technological development. While not finding a true space of development in the art and music scene, the tradition of visual music slowly blended in the popular culture.

11. The digital era: state of the arts in visual music

The digital era took over the 21st century by storm. Already starting in the last decade of the previous century, the changes that were affecting the world —the post Cold War, end of Soviet Union, the U.S. as super world power, the fall of the Berlin wall, and the many transition periods from dictations to democracy of countries around the world— separated the arts in movements and viewpoints. Just as it happened with the industrial revolution and the arrival of modernity, the globalization and the rapid technological progress (the “fourth industrial revolution”) became the main theme of the 2000s to which *“many artists responded by gravitating towards issues of tangible lived experience and identity.”*⁶² Soon enough these topics would appear in the concert halls and galleries. With these new influences, visual music would now emerge in sound art, electronic music, media art, as well as the mainstream.

10.1 Visual music in popular culture

In the popular culture, before the computer technology became accessible to the masses, visual music was already gaining importance in the 60's and 70's, especially after the ideas of the beat group, were taken by the hippies. In the New York clubs and disco scene, the rock festivals and electronic psychedelic light shows, the images resembled the visual music of the Whitney brothers, Belson and Smith. Soon the music performances would in-

⁶² LeBourdais, G. P. “*The 1990s*”. 24, Aug 2015. Retrieved February 26, 2019, from <https://www.artsy.net/article/artsy-editorial-the-most-iconic-artists-of-the-1990s>

tegrate visuals as part of the show and the Vj's would become a key figure in the night life.⁶³

Later, the abstract visuals of the music visualizer software arrived to the home computers. As a result, nowadays most people relate visual music to a psychedelic-like computerized imagery that renders from a chosen music. These media player software became extremely popular in the 1990's and 2000's. In fact, when typing visual music on YouTube, the results correspond to this aesthetics: "*Calm Relaxing Psychedelic Journey*", "*Shamanic Meditation Music*", "*Psychedelic Trip Music and Visuals*", "*Background Music- Instrumental, Positive, Harmony & Visuals*", to mention a few.

This would explain why visual music lost part of its seriousness and was instead transferred to an idea of background entertainment, when originally the images were intended to be part of an immersive synesthetic spiritual experience. But, aside of this mainstream approach to visual music, some artists and musicians have kept on developing visual music in other forms and aesthetics, embracing the new technologies and new contemporary practices.

10.2 Contemporary visual music pieces

Artists of different realms have introduced the 21st century perspectives to visual music, providing an aesthetic that relates more to the actual contemporary art paradigm. Ryoji Ikeda (*1966), for instance, took elements of electronic music and media art to make large-scale installations as gigantic visual music pieces. Such is the case of "*The Radar*", a series of site-specific video projections displayed all around the world. These pieces could fit in many categories of art, from plain visual arts, electronic music, trans-media art, to sound art. But regardless, its aesthetics respond to the before mentioned digital era influence that has amused the multitudes in the last years.

⁶³ See: Lund, C. & Lund, H. "*On the Aesthetics of Contemporary Visual Music*". Lund, C. & Lund, H.(eds.). Lund Audiovisual Writings, 2017. <http://www.lundaudiovisualwritings.org/aesthetics> (p.6-8)



The Radar, site-specific installation, 2012.

Ryoji Ikeda

Photo by Bernardo Palmeiro

<http://www.ryojiikeda.com/project/theradar/>

The German visual artist and musician Carsten Nicolai (*1965) alias Alva Noto, is specially relevant to the composers who have been expanding their work to video, electronic music, media art and scientific phenomena. His work is generally linked to electronic music and cymatics visuals, but in some of his collaborations, for example with the composer Ryuichi Sakamoto (*1952), the combination of instruments and the colorful projection almost resemble some early visual music pieces.

Nicolai's artistic statement can be mirrored to the manifestos and main fundamentals of the visual music pioneers. By situating his work in "*the transitional area between music, art and science*"⁶⁴ —statement that could belong to the very definition of visual music— he is dealing not only with active role of the artist and its context, but also with a generational phenomenon that is embodied in this new type of artists, much like the one Ruttmann had anticipated already in 1925. But, unlike many artists of the past century (specially from absolute art and absolute music), this type of artist is not exclusively concerned with art itself. He or she uses art to "*overcome the separation of man's sensory perceptions by making*

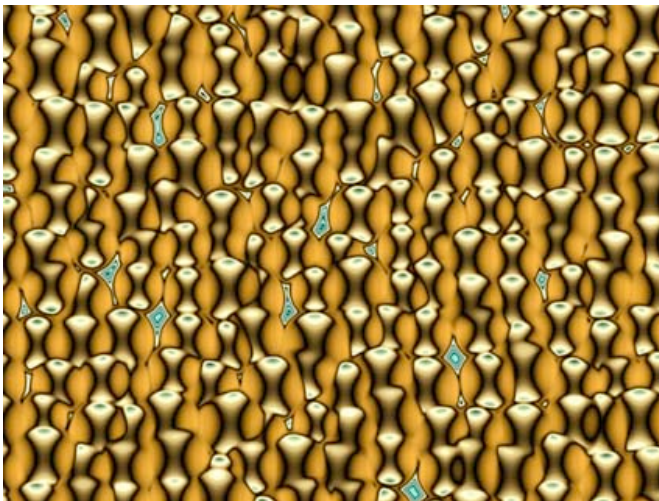
⁶⁴ Nicolai, C. *Biography*. Retrieved February 15, 2019, from <http://carstennicolai.de/?c=biography>.

*scientific phenomena like sound and light frequencies perceivable to both eyes and ears.*⁶⁵

Like these cases, there are several pieces that are hidden in the concert halls, small galleries and probably even more in the experimental and underground niche. That is to say, nowadays, visual music can be found in almost any form, genre and place, usually blended with new artistic aspirations. But there is also a line of artists that seek to keep the visual music tradition and have specialized on that.

Maura McDonnell is an Irish artist that has focused mainly on visual music. Her work uses *“visual effects and generative effects video and the style of her work is abstract.”*⁶⁶ Her visual works are built on electronic music compositions of contemporary composers. She explores very methodically aspects of harmony, rhythm or synthetic tones timbers.

Another contemporary visual music artist is the American Brian Evans who has become active in the visual music scene, providing research and several pure abstract visual music films. Evan’s music and visuals compositions tend to luminous texturized fields of colors and light electronic atmospheres. His work proposes the idea that *“sound waves of music are seen as light waves of color.”*⁶⁷



anemonic (2004) by Brian Evans
Digital print, pigmented ink on paper

Retrieved February 26, 2019, from Brian Evans (art and research) <http://brianevans.net/>

⁶⁵ Nicolai, C. *Biography*. Retrieved February 15, 2019, from <http://carstennicolai.de/?c=biography>.

⁶⁶ McDonnell, M. *A Short Biography*. Retrieved February 26, 2019, from <https://www.mauramcdonnell.com/about>

⁶⁷ Loupe Art. *“Brian Evans - Artist.”* 2017. Retrieved February 26, 2019, from <http://info.loupeart.com/brian-evans-artist/#artist33>

The contemporary visual music scene although small, has become a solid place of exploration of the ideas first presented in the beginning of the last century. Of course, the influences of the digital era are now part of its aesthetic. The striking colors, the sudden movements and the geometric shapes of the first visual music films seem to be left behind and replaced by amorphous and unclear shapes, fused in a soft and gradual fading of color and texture. Like the music that usually accompanies these pieces, the sequence of images moves away from a clear narrative and focuses on the contemplation of particular atmospheres.

The contemporary visual music practices are expressed in three main categories: *“pure abstraction, hybrid media and realistic graphics (often in virtual environments). Pure abstraction in contemporary practices uses a form of reduction to break down graphics to the simplest shapes and then, it reconstructs them into more complex forms. Hybrid media’s main element is the amalgamation of different representational or abstract images, such as edited images, 3D graphics or text. Lastly, realistic graphics can be found in visual effects, video games, and virtual reality”*.⁶⁸

10.3 Visual music exhibitions and current research platforms

In the 1990’s and into the first decade of the 2000, visual music was celebrated and recognized through large exhibitions that compiled fundamental work of the current and past century.

The first major exhibition that focused entirely on visual music, was *“Visual Music: Synaesthesia in Art and Music since 1900”*. It evolved from a collaborative project that had the ambition of tracing *“a single idea (visual music) as it unfolds in time and traverses various medias.”*⁶⁹ The exhibit took place on February 2005 at *The Museum of Contemporary Art* in Los Angeles, and later in June of the same year in *Hirshhorn Museum and Sculpture Garden* in Washington D.C. Although the curators were very much aware that *“the achievements of visual music are so profuse and varied that no single exhibition could en-*

⁶⁸ Kanellos, Emmanouil. *“Visual Trends in Contemporary Visual Music Practice.”* Body, Space & Technology, Open Library of Humanities, 4 Apr. 2018. Retrieved February 26, 2019, from www.bstjournal.com/articles/10.16995/bst.294/.

⁶⁹ Brougher, Mattis, Strick, Wiseman. *“Visual Music: Synaesthesia in Art and Music since 1900.”* Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005.

*compass the full range of work produced over the past ten decades,”*⁷⁰ the exhibit managed to cover a substantial number of artists of all kinds of fields, nationalities and generations, from the pioneers (Eggeling, Ruttmann, Richter, Fischinger, etc), to Kandinsky, Schoenberg, Baranoff-Rossiné, Messiaen, Man Ray, Whitney brothers, and contemporary artists like Stephen Beck (*1950), Jennifer Steinkamp (*1958) and Leo Villareal (*1967).

Also in 2015/2016, the *“Abstract visual music”* exhibition was held in the New York Digital Salon. The exhibit gathered works of contemporary artists *“that operates under the premise that perception of one sense can manifest as another”*. This open call, allowed different types of visual music like the *“pure silent visual music tradition of Thomas Wilfred’s work (called Lumia), some literal translations of image to music”*, along with some works that were included *“not as a work of visual music but rather a work about visual music.”*⁷¹

Other sound and image related exhibitions were *“Vom Klang der Bilder”* at the Staatsgalerie Stuttgart in 1985 (*“perhaps the most comprehensive exhibition to date in its exploration of the relationship of art to sound and music”*⁷²) *“Soundings”* at the Neuberger Museum, Purchase, NY in 1981, *“—auf ein Wort! Aspekte visueller Poesie und Musik”* at the Gutenberg Museum in Mainz, Germany in 1987, *“Between Sound and Vision”* at Gallery 400 at the University of Illinois at Chicago in 2001, *“Sons et Lumières”* at the Centre Pompidou, Paris in 2004 and *“What Sound Does a Color Make?”* that toured around the U.S and New Zealand between 2005 and 2007.

Both the preservation of visual music pieces as well as the active research of it is being held up by only a few centers and online platforms. These conform most of the bibliography of this thesis and many other visual music related papers.

One of the most important is *The Center for Visual Music in Los Angeles*. The CVM *“is a nonprofit film archive dedicated to visual music, experimental animation and abstract me-*

⁷⁰ Brougher, Mattis, Strick, Wiseman. *“Visual Music: Synaesthesia in Art and Music since 1900.”* Los Angeles: Museum of Contemporary Art; London: Thames & Hudson, 2005.

⁷¹ Ox, J and Keefer, C. *“On Curating Recent Digital Abstract Visual Music.”* 2006. Retrieved October 30, 2018, from Center for Visual Music, http://www.centerforvisualmusic.org/Ox_Keefer_VM.htm.

⁷² Ox, J and Keefer, C. *“On Curating Recent Digital Abstract Visual Music.”* 2006 Retrieved October 30, 2018, from Center for Visual Music, http://www.centerforvisualmusic.org/Ox_Keefer_VM.htm.

dia. CVM is committed to preservation, curation, education, scholarship, and dissemination of the film, performances and other media of this tradition, together with related historical documentation and artwork”⁷³. The CVM was founded by a number of institutions, centers and foundations (National Film Preservation Foundation, Centre Georges Pompidou in Paris, The Fischinger Trust, George Lucas Family Foundation, to mention a few) and has been under the direction of several renowned visual music artists, curators and researchers like John Whitney Jr., Barbara Fischinger, William Moritz and the current director Cindy Keefer.

The center supplies an online library of archives and researches, lists of artists and works and other information that supports, guides and advises anyone that is interested in the subject.

Another helpful source is *fluctuating images*, created by Cornelia and Holger Lund, researchers and authors of the book “*Audio.Visual —on visual music and related media*”. As is explained in the website, “*fluctuating images is a platform for the presentation of and reflection on (media) art and design*”, in which the “*aim is to foster a fruitful exchange between aesthetic and discursive approaches to the multilayered challenges presented by our technology- and media-driven world from a global and decolonial perspective*”⁷⁴. This platform is focused mainly on the current development of visual music (basically 21st century) and it contains a number of other media art related projects.

The list continues with *Visual Music Archive* (<http://visualmusicarchive.org>), visual music blogs like *Maura McDonnell's* (<http://visualmusic.blogspot.com>), and festivals and awards like the *Visual Music Award* (<http://visual-music-award.de>) and *CAMP*, international festival for visual music (<http://camp-festival.de>).

All of these platforms allow us to contemplate the current situation and the history of visual music from the perspective of the researchers and curators, and through the works of the artists.

⁷³ Center for Visual Music. Retrieved February 18, 2019, from <http://www.centerforvisualmusic.org/>

⁷⁴ Lund, C., & Lund, H. *CONCEPT*. Retrieved February 18, 2019, from <http://www.fluctuating-images.de/concept>

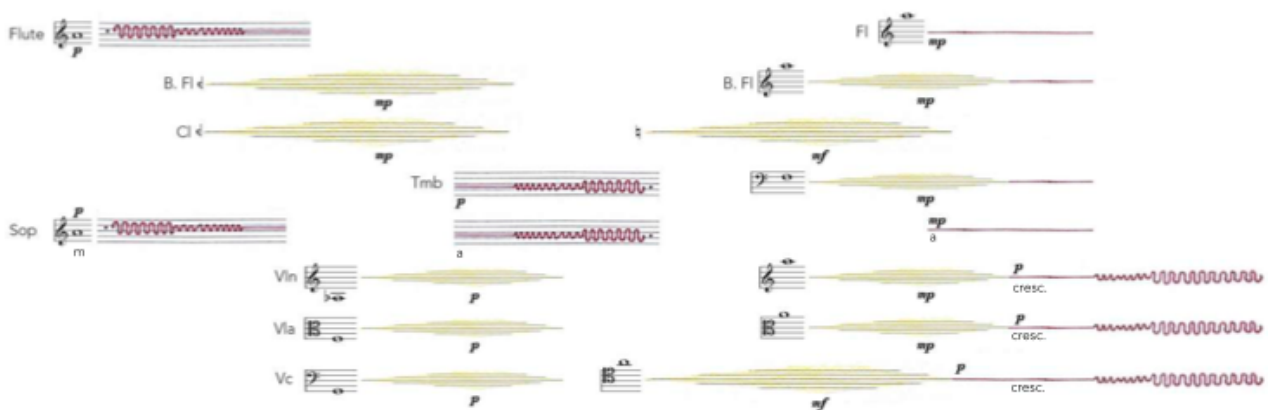
12. Visual music in my work

I was first drawn to visual music because I found in it a common ground with my own interest and ideas. While learning about its history and discovering the pieces and the artistic proposals, I realized that without knowing it, I myself had explored into visual music. In this section, I will explore visual music elements in selected pieces of my portfolio.

Starting the first years of my composition studies, I was already interested in synesthesia and the relation of sound and color, and as a consequence, some of my early compositions were based on the idea of visual color and texture mirrored in a subjective interpretation of sound. These pieces were excellent composition exercises, but unfortunately the task was too big for the little experience I had. Most of these works developed to a different direction and after some years were excluded of my portfolio.

After my bachelor studies, I organized and compose my first solo concert, in which I managed to include again the idea of image and music. The concert consisted on three pieces with several movements and a projection throughout the whole program. The first two thirds were a simple and subtle color transition and the final part consisted of a black and white animation.

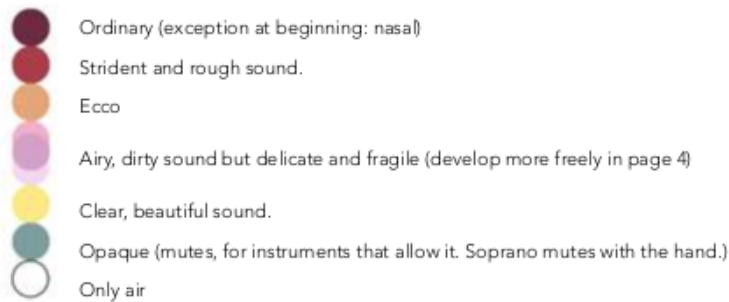
A year later, I moved to Linz where I started the master studies in composition. Given that the interest in synesthesia was still there and I was getting involved more and more with visual arts, I decided to explore with color and shape in graphic notation



Page one of *Organic 2.0* (2017) by Roberta Lazo Valenzuela

“Organic” (2016) was premiered by ensemble *zone expérimentale* in the festival *Leicht über Linz*. In the next years a second and a third version would be made for other instrumentations. The piece combines graphic and traditional notation where the drawings serve as a map for the musicians to explore different sound-colors and textures. Like the pitch-color proposals of the renaissance, I created a color palette with its own symbology, trying to work with the quality of the sound instead of the pitch.

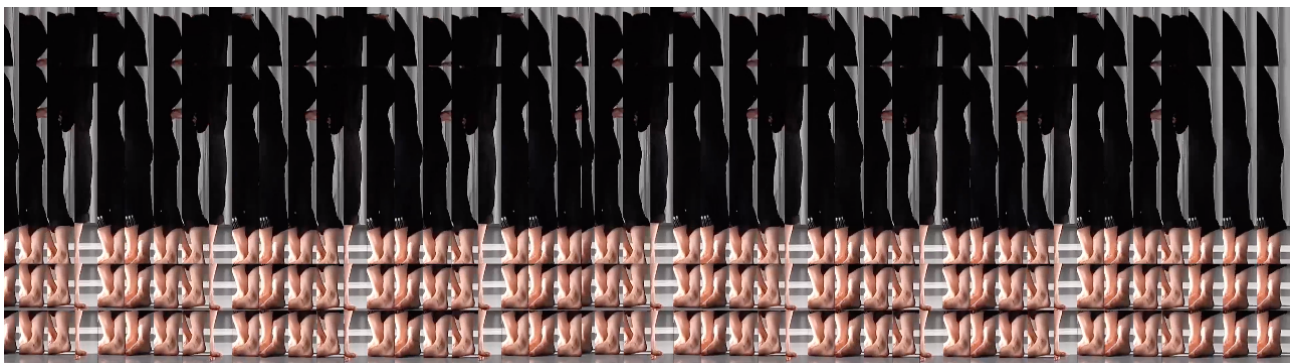
Color palette



Organic 2.0 (2017)
 Color palette of index
 Roberta Lazo Valenzuela

In the same festival in 2016, I presented the silent video poems “YohyYo”. In this piece I wanted to evoke inner-sound by using the movements and gestures of the dancer Yoh Morishita. The concept was the visualization of sound without sound: soundless video poems that suggest a certain musicality throughout the visual.

It started as an experiment, an exercise to visual composition, but then I found myself questioning the purpose of it. What I was trying to achieve was not based on a visual narrative, but on a musical and sound experience. It was a transduction from the musical-compositional thinking to a video format. From there, the idea burst out in different experimentations of musical content in inaudible forms.



Film still from *YohyYo* (2016)
 Roberta Lazo Valenzuela

“YohyYo” was a turning point in my work. Composition was no longer limited to music and sound related art it was now open to the possibility of imaginary sound, expanded synesthesia, strong visual and performative components and a different dynamic with the audience. As a consequence of this paradigm shift, the pieces that followed explored various ideas with non-musical elements, returning from time to time to silence, visual music and the importance of perception and the senses.

Related with silent visual music, other thoughts emerged, hinting the new project that is now in progress:

- The memory of a sound is usually connected to the memory of other senses, an image, a smell, or general context.
- Therefore, sound can be triggered, by appealing to these senses involved.
- Now, instead of just triggering a sound through image, it could be possible to change, vary and re-compose sound (memories) by interfering with the visual context that relates with the memory.
- If so, then silence could be a platform where one can create unique and un-transferable sound experiences, which are as well subjective and can change depending on the new experiences one have had (for example, discovering new sounds in daily life: objects, doors, etc.)
- All of the above can be learned and trained.

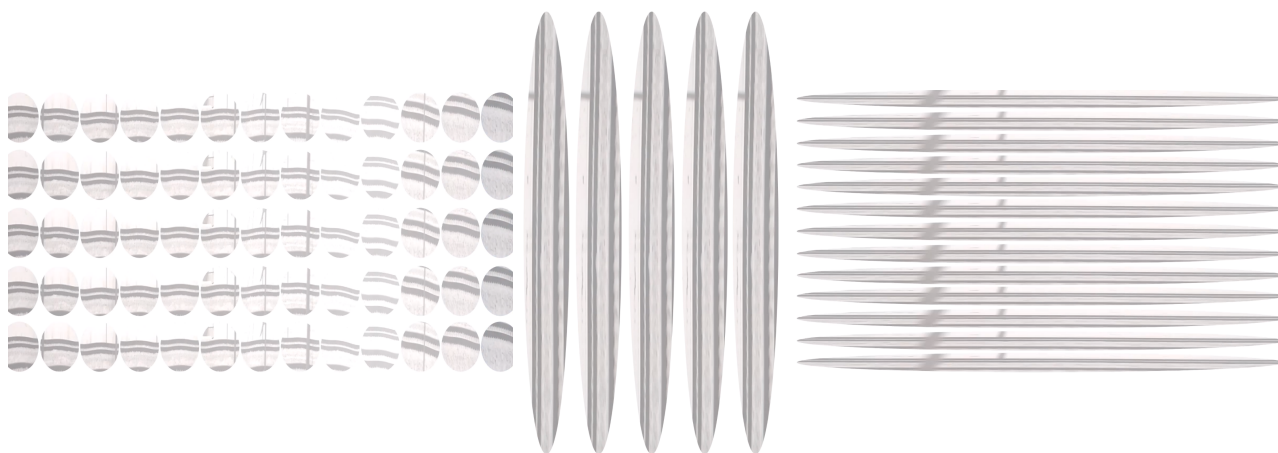
It is more than evident, that this line of work has a similar aim to the Lumia works of Thomas Wilfred, where the composition is also made on musical ideas but the piece is presented in silence. It relates as well to several other silent pieces previously mentioned and it shares a common ground with visual music concepts like *“Listening with eyes, seeing with ears”*⁷⁵ and *“seeing sounds: moods through the eyes as music creates moods through the ear”*⁷⁶.

Some of the latest experiments I have made, are thought as visual music exercises where visual and sound composition, are practiced using the same principles. This series

⁷⁵ Visual Music Archive. *About*. Retrieved February 19, 2019, from <http://visualmusicarchive.org/about.html>

⁷⁶ CVM. *Synchromy No. 2* | Mary Ellen Bute. Retrieved February 20, 2019, from <https://vimeo.com/267597076>

of films, some of them silent, have not been shown yet since they belong to a larger project that is still in the making.



Film still from *Untitled* (2018-2019)
Roberta Lazo Valenzuela

13. Conclusions

In writing this thesis, I stumbled upon many semantic and structural challenges. Eventually I realized that these doubts were reflection of the unanswered questions I had in my own work: what is art and what is music, where is the line between them, is there a clear line, how and where are these works presented. The relief of knowing that this has been an issue shared by many through the years helped me to approach the subject from a different perspective. Instead of searching for one answer, I realized there were as many answers as there were pieces. It was not a matter of “what” and “which” but of “how”. And so, the research, naturally redirect itself to an observation of the how. I decided to look into the variety of results in the combination of image and sound. To which, visual music seemed like the optimal field of study to develop that.

Finding a definition that would fit the different types of visual music works was something I could not easily put in words. I had to go through the research of many to understand that the term points towards an idea more than a fix definition. Indeed, there are several authors that refer to it as a problem, some of them even propose categories from which one can look at visual music, making it easier to comprehend its multi essence. The importance of the interconnectivity that is part of visual music, is most times lost in the at-

tempt of rationalization and structure. The topic of categories, realms and field divisions is constantly peeking out when discussing about visual music, and it will certainly continue to be an issue for many. To really understand it, one should look into the works, the ideas proposed and above all, one should embrace the multiple art forms that visual music adopts.

I was confronted with another problem that results from the origin of the term and the consolidation of the visual music tradition. Does visual music need to be time-based, considering that there are paintings that are described as visual music? In addition to this thought, if some non time-based pieces are visual music (like some abstract paintings), and some silent pieces are as well within the concept of visual music (like the Lumia films), is it possible that there are also silent non-time based visual music pieces —like some visual poetry, for example of Gerhard Rühm?

To reduce and select key artists of the history of visual music was another challenge. Throughout the research, I had to dismiss several pieces and art movements simply because I could not really fit them in the history. Even so, I think some of them could be seen as a different manifestation of visual music; for instance, the Wiener Gruppe (Vienna Group) formed in 1953.

Although nowadays there is a clear influence of the digital era and the Neo-conceptualism and Neo-expressionism, I am actually not entirely convinced that what now is being done in media art, which is also at times called visual music —mainly because of the sound-visual correlation— is actually responding to the main premise of visual music. For me, a visual music piece should concern itself with the exploration of music or/and sound in the visuals, therefore, a synchronization of the two is not enough to consider a piece visual music.

Visual music does not come exclusively from a visual need. In fact, it has been pointed out in more than one occasion that many of the pioneers come from a musical formation. Even so, the focus has been placed mainly on the visual, and I wonder if the contemporary works presented in the concert halls or in small cultural associations are not also part of the visual music practice.

Visual music was born from appreciation and admiration of certain kind music, a music that was composed under the traditional parameters of pitch, harmony and rhythm. One can also observe that the transposition of this music to visual imagery is more or less literal in the relation of movement-rhythm, color-pitch and harmony. Like the sound elements, the colors and shapes are most of the time clean and structured. And as the rhythms are generally organized within a metric and pulse, so is the movement of the elements in the films. Now, looking at the paradigm shift of the past century in music —where the focus is on sound itself— I wonder how would a visual music look like, if its core is not on the clearness of the pitch, or the pulse or the harmonic development, but in the quality of sound, the textures and complex interactions of sound gestures. How would this be transported to a visual form?

Given that this research biased towards a more visual perspective —this is of course due to the connection of visual music with abstract painting and cinema— it would be interesting to investigate about visual music from a contemporary music point of view. With this I mean, to inquire into pieces that come (or result) from the scenic and performative line of work that develops from the composers of the 1950's and 1960's: music theater, the influence of dadaism, experiments in dance, etc.

The evident inter-discipline, a devout belief in synesthesia and the peculiar perspective towards art and music in general, provide a particular way of understanding, seeing, listening and creating that other art forms do not have. I observed through this research the different ways artists dealt with the interaction of music and image and how in this experimentations, another type of artist was born, one that is right in between realms and that embraces the possibilities of the indefinite. Very few writings stop to understand where this impulse came from and what all these artists have in common.

As for silent visual music, it is a topic that has not yet been addressed by researchers and would be necessary to approach from both a theoretical and practical way. I believe that especially in this sub-area, the sensitivity of the artist is even more refined, and the view of the arts is probably more open and integral. Much of these works will continue to be overlooked and misunderstood, for which it is necessary to show and talk about them, in hopes they will not get lost like Scott's "*Silent music*" and some early visual music films.

The path of visual music will keep on developing, accepting new ideas and images. It is important to remember that visual music covers much more than films. The artifacts, machines, color organs and other experiments are all part of its history and philosophy, which has directly and indirectly contributed to the current art and music manifestations.

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15. Complementary material

Books and articles

120 Years of Electronic Music, “*Graphical Soundtrack Arseney Avraamov, Russia, 1930.*” (2014, March 27). Retrieved from <http://120years.net/graphical-soundtrack-arseney-avraamov-russia-1930/>

Achleitner, F. & Weibel, P. “*Die Wiener Gruppe = The Vienna Group: a Moment of Modernity 1954-1960; the Visual Works and the Actions.*” Springer, 1997.

Boehmer, K. (1997). “*Schönberg and Kandinsky: An historic encounter*”. Amsterdam: Harwood Academic.

Cage, J. (2011). “*Silence: lectures and writings*”. Wesleyan University Press.

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Hyde, J (2012) “*Musique concrète thinking in visual music practice: audiovisual silence and noise, reduced listening and visual suspension.*” *Organised Sound*, 17 (2). pp. 170-178.

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Solomon, L. J. (1998). “*The sounds of silence: John cage and 4’33”*”. Retrieved from <http://www.azstarnet.com/~solo/4min33se.htm>.

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Videos

Facts1900b. (2006, December 04). *"Piano Optiphonique"*. <https://www.youtube.com/watch?v=l2BnanDDeFg>

Film1023paper. (2007, April 23). *"Video Clip 3: Optical Sound Track Types"*.
<https://www.youtube.com/watch?v=0ekWozMjFW0&list=PLZ1EaAuPMEWHEEFuZRRd-FIWdKvxlDqF-d>

Jordotech. (2015, December 14). *"John Whitney- A Personal Search For the Complementarity of Music and Visual Art (1992)."* <https://www.youtube.com/watch?v=uunwKF7AUkc&t=1130s>

Oyarzo, M. N. (2011, May 27). Arseny Avraamov - Symphony Of Factory Sirens (Public Event, Baku 1922). https://www.youtube.com/watch?v=Kq_7w9RHvpQ

Specialized visual music websites

www.centerforvisualmusic.org/
www.fluctuating-images.de
www.visualmusic.blogspot.com/
<http://visualmusicarchive.org/about.html>

Artists websites

Brian Evans: <http://brianevans.net/>
Carsten Nicolai: <http://carstennicolai.de/>
Ginna Corra: <http://www.ginnacorra.it/>
Harry Smith: <http://harrysmitharchives.com/>
John Cage: <https://www.johncage.org/>
Maura McDonnell: <https://www.mauramcdonnell.com/>
Ryoji Ikeda: <http://www.ryojiikeda.com/>

Other websites

Collins Dictionary: <https://www.collinsdictionary.com/dictionary/>

Film Makerscoop: <http://film-makerscoop.com/catalogue/>

Flicker Alley: <http://www.fandor.com/films/>

Merriam-Webster Dictionary: <https://www.merriam-webster.com/dictionary>

Museo Nacional Centro de Arte Reina Sofía: <https://www.museoreinasofia.es/coleccion/>

National Film Board of Canada: <https://www.nfb.ca/>

The Art Story, modern art insight: <https://www.theartstory.org/>

16. Thanks

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17. Eidesstattlichen Erklärung

Hiermit erkläre ich eidesstattlich, dass ich die vorliegende Arbeit selbstständig und ohne fremde Hilfe verfasst habe. Alle Stellen oder Passagen der vorliegenden Arbeit, die anderen Quellen im Wortlaut oder dem Sinn nach entnommen wurden, sind durch Angaben der Herkunft kenntlich gemacht. Dies gilt auch für die Reproduktion von Noten, grafische Darstellungen und andere analoge oder digitale Materialien.

Ich räume der Anton Bruckner Privatuniversität das Recht ein, ein von mir verfasstes Abstract meiner Arbeit auf der Homepage der ABPU zur Einsichtnahme zur Verfügung zu stellen.

Linz 17.3.2019

A handwritten signature in black ink, appearing to read 'Roberta Lazo Valenzuela', with a stylized, flowing script.

Roberta Lazo Valenzuela