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Bachelor Thesis

Materiality as a perspective for artistic experimentation

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Abstract

This paper proposes a conception of materiality as a perspective for artistic experimentation. It centres on a discussion of a different understanding of the role of materiality in artistic practices. A central point of discussion is the concept of “Absent Matter”, in relation to my project *Un_inverso,* following the idea of the designer and artist Edoardo Tresoldi. This text aims to present a direct relationship between the concept of *matter* and the aesthetic of imperfection, more specifically the post glitch aesthetics, by using a comprehensive analysis of the project mentioned above, placed in a larger context. The idea of materiality is applied also to sounds, supported by the drawing on the Heideggerian concept of the thing, outlining a conception of sound as a non-symbolic thing. The proposed idea finds a connection also from an aesthetic point of view. In fact, the use of a glitch aesthetic suggests an idea of transparency, in which the potential and "failures" of technology appears more clearly. They are reflected in basic sounds (click, noise, sinusoids), in direct dialogue with the constituent elements of the project *Un_inverso*. They are represented by video content and a series of wire mesh models, which have two levels of reading: as constituent elements of architecture (for example, the pillars as regards real models and architectural drawings as regards videos) or as models of complete buildings.

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Introduction

With this paper I initially propose a historical vision of the concept of *matter*. I find it important to lay the philosophical basis for this concept before describing in detail how it has influenced my artistic practice. The intention is to find a possible answer to the question "What is matter"? Then, after briefly illustrating some of the main theories, from Aristotle to Leibniz, the focal point becomes my project *Un_inverso*. It is a work composed in the last year, which investigates the concept of *absent matter* (a concept developed by the designer Edoardo Tresoldi), in relation to post-glitch aesthetics, which finds its exponents in audiovisual artists such as R. Ikeda and R. Kurokawa. The multimedia project consists of two different screens, live electronic and lights, lights that will be used to generate shadows thanks to the presence of different wire mesh models. Being my artistic work the center of the thesis, I realized a short but detailed technical analysis. The prevailing aesthetic of the above mentioned project is the glitch one, of which I report in this paper its evolution and the context in which it has developed. Another question I asked myself during the realization of the project was related to the concept of *the materiality of sound*, that is if it was possible to conceive sound as a tangible element. This is a fundamental point of my artistic work, in which I try to reach a sense of totality of art, putting the experience of the listener at the center. From my point of view the concept of glitch art is inextricably linked to the concept of imperfection, seen as a basic element, almost as if it were a possible origin of art, as explained in the last chapter of the following text.

Thinking about matter

1.1. The cultural concept of matter

The concept of matter is inextricably linked to philosophy, especially to metaphysics. The term matter, used in everyday life as well as in science, is however very ambiguous. But what is *matter*?

The common idea could be that *matter* is “the stuff which we experienced as extended and as offering some degree of resistance, and of which physical objects are made

up" (Antognazza, 2015, 161). *Matter* is therefore conceived as an "impenetrable something, which fills completely certain regions of space and which persist through time even when it changes its location." (Milič Čapek, 1961, 54). It is interesting to note, however, that through modern physics it is almost impossible to think of physical objects or bodies as "stuff" that we have experienced, and that the idea of matter does not belong in technical terms to physics but to philosophy and meta-science. To understand the concept of matter we have to take into account different philosophical perspective, starting from the past. The Aristotelian model of hylomorphism is one of the most important one, which conceived the "substances", as constituted by two metaphysical principles: matter and form.[1]

> "Matter is the ultimate subject of change implied by the Aristotelian analysis of change as involving a substratum in which now certain form, then another form inheres. The intuitive picture is that of clay which receives a form, being shaped, say, into a vase, and then into a statue and so on. The form is what relized, or makes actual what is merely potential, that is, actualizes the potential of the lump of clay to become a statue." (Antognazza, 2015, 162)

We can then understand "matter" not as a "thing" but as metaphysical principle. "Matter" is a metaphysical principle which is postulated to explain, tighter with form, those very particular, changing things which exist in their own right. The analogy that is used in Antognazza's quotation is precisely an analogy and not an example of what matter is.

Another interesting point of view is given by Aquina, where matter is described as "pure potentiality which receives all its actuality from the form. As in itself pure potentiality, matter cannot exist without one form or another inhering in it. Duns Scotus, however, was quick to point out that matter conceived as pure potentiality amounts to nothing: if you want to have proper pure pottery, without any act, you will have nothing: as in privation without subject" (Antognazza, 2015, 163).

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[1]According to the Stanford Encyclopedia of Philosophy Aristotle famously contends that every physical object is a compound of matter and form. This doctrine has been dubbed "hylomorphism", a portmanteau of the Greek words for matter (hulê) and form (eidos or morphê). Highly influential in the development of Medieval philosophy, Aristotle's hylomorphism has also enjoyed something of a renaissance in contemporary metaphysics. At https://plato.stanford.edu/entries/aristotle-metaphysics/

But an innovative vision comes from Leibniz, who starts to think about the concept of matter from the corporeal world of physical objects, that is, the solid, extended stuff of which we have experience. Maria Rosa Antognazza provides a comprehensive view on Leibniz's ideas. She points out how his early reflections on extension and the physical world lead him however to his contention that the primary qualities of bodies identified by mechanistic physics, magnitude, figure and motion, are insufficient to account for out experience of the phenomena of the corporeal world. In particular, the fact that matter, conceived by Descartes as extension, is infinitely divisible, and even, according to Leibniz, actually infinitely divided, indicates that it does not have in itself the intrinsic principle of unity needed to qualify as a "substance". The very analysis of corporeal phenomena calls for the postulation of an incorporeal principle which Leibniz, following traditional Aristotelian terminology, initially calls "substantial form". Leibniz's substantial form is the intrinsic principle of unity and activity needed by a being to qualify as a substance. As Brandon C. Look said the metaphysics of Leibeniz is reducible to the questions "What is there? What are the most basic components of reality? What grounds what?" The fundament is that everything is composed of or reducible to *simple substances*; "everything is grounded in simple substances" (Brandon C. Look, 2013). Later Leibeniz, influenced by Scotus and Ochham (they conceived primary matter as pure potentiality leads to the identification of primary matter with non- being) led him to the idea that "Primary matter is merely a way to express the negation of some further perfection. In brief, Leibniz moves away from the broadly Aristotelian framework of primary substances as composited of two ontological constituents, form and matter" (Antognazza 2015, 166)

2. Matter as an artistic perspective

2.1. The presence of absent Matter

The concept of absent matter comes from the idea of the artist and designer Edoardo Tresoldi, who, through scale works, reconstructs with wire mesh the missing structures of architecture of the past.

> The Absent Matter is the representation of a mental projection, filter and shape through which places, instants and beings are narrated. It triggers uninterrupted dialogues with space and history, and projects the object's substance into an unknown temporal dimension: what has disappeared, or never existed, lives again in a different time. The language of transparency weaves the non-existent, transforms the denial of matter into a three-dimensional entity, and reveals the result of a void, therefore the abstraction of reality and its timeless visual identity. Wire mesh's broken rhythms generate never-ending sequences of architectural abstractions and amplified points of view, while the atmospheric factors contribute to an interpretation under different moods. A dynamic and iridescent space is outlined, in which it becomes possible to experience a pure, ethereal dimension, in continuous dialogue with the contemporary surroundings, understood as a blending of cultural, social and identity codes, whose acts become constituent parts of the artwork.Sculptural and alive artworks are born, able to generate personal and collective experiences which evolve through their components. (Tresoldi)

Resuming the above concept I thought to integrate in my project *Un_inverso* models different architectures entirely made with wire mesh (the size of the model is between 50 cm and 1.50 m). The 15 minutes works is conceived for stereo diffusion, 20 LEDs attached to 8 wireframe models and two videos (projected on two different screens) and one performer. It is entirely created and performed with the softwares Touchdesigner and Supercollider. To keep the contact with the concept of "Absent Matter" also the videos have been thought to be projected on two transparent plexiglass screens, covered by a special holographic foil. The project, on a visual level, refers to four different sorts of material: a landscape, based on images related to the Universe and the Earth (as it is shown in Fig.1), de- and reconstructed architectures through digital processes (as it is shown in Fig.2), numerical representation of the Live Electronics process (as it is shown in Fig.3), and shadows, generated through the LEDs attached to the wire frame models (as it shown in Fig.4).

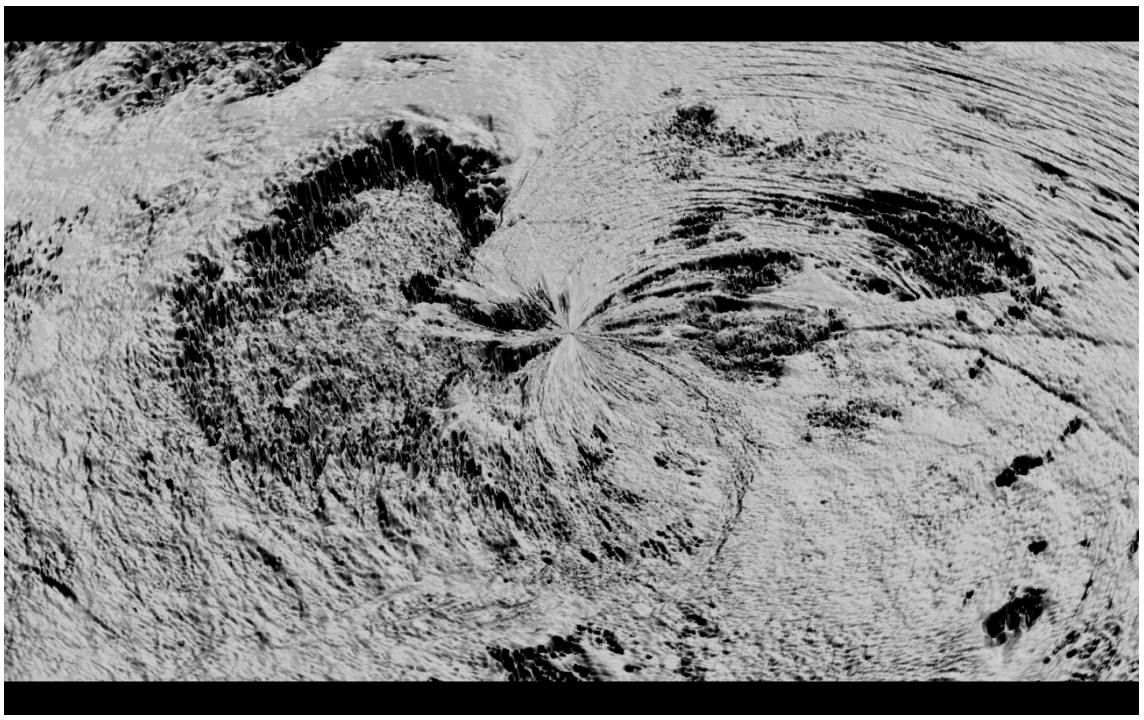

Fig.1: image taken from the first section of the project “Un_inverso”. It is the 3D representation of the Earth viewed from the Space.

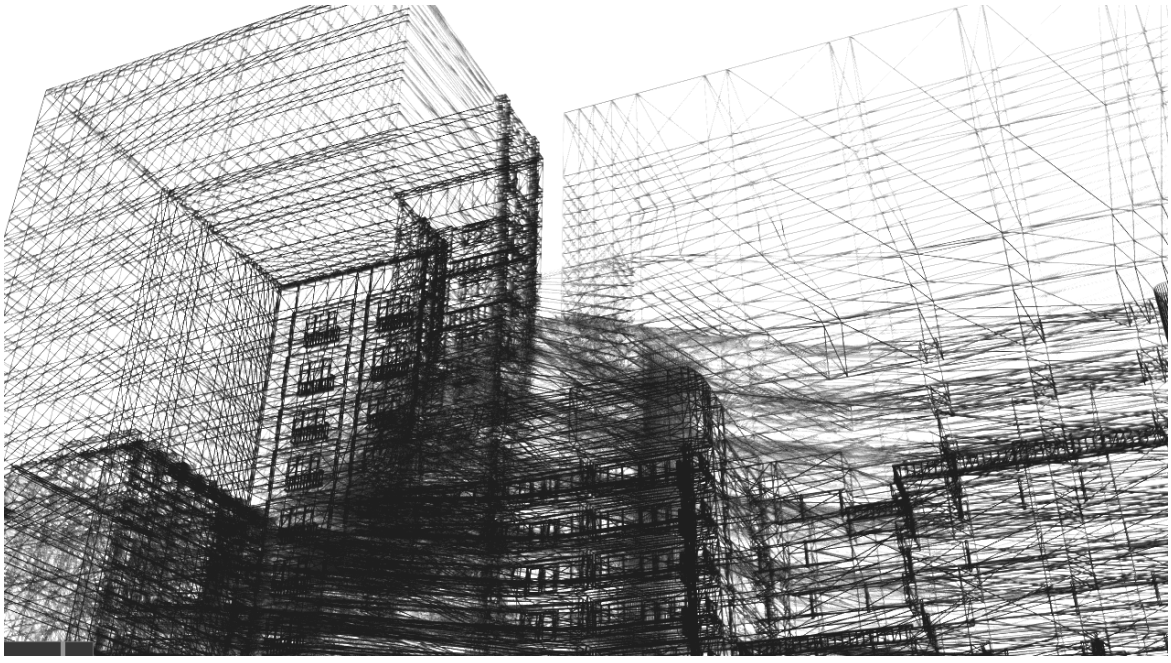

Fig.2: image take from the second section of the project “Un_inverso”. An example of de - and reconstructed architecture

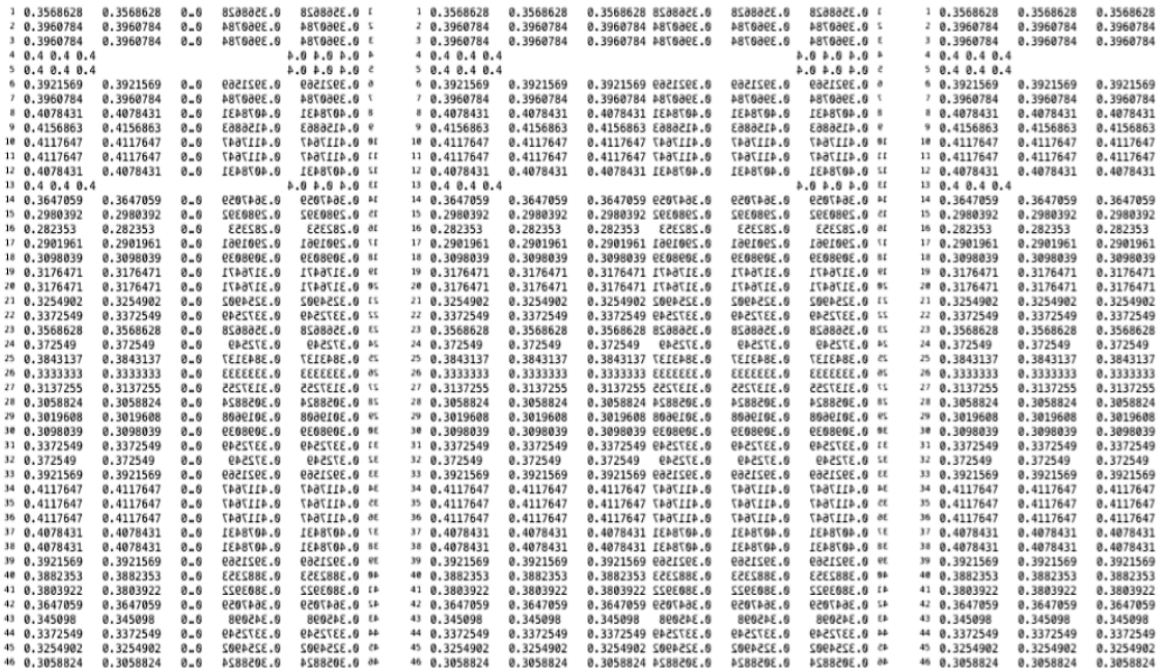

Fig.3: image take from the second section of the project “Un_inverso”. Numerical visualization of the scanline of the shadow of the wireframe model.

Fig.4: Photo of the wireframe model and its shadow, generated by 8 LEDs

In order to create a direct interdependency between image and sound, I used in the live electronics process the method of Scanline Synthesis, through which (using a Wave Shaping principle) the sound wave is generated through the numerical values (from -1 to 1) obtained by reading, in this case, a line of pixels of the videos and the shadow of the wire frame models, for a total of 1024 values[2]. Through the Supercollider software I combined the processes of Scanline Synthesis with different Chaos Generators[3]. Also their parameters are entirely controlled by the values of the same pixel line that Scanline Synthesis refers to. The idea of using the above mentioned Live electronics processes comes from the intention to translate into sound the configurations created by the wire mesh models, their shadows and their digital representation according to the perspective with which they are filmed (as far as real models are concerned) or processed (as far as videos are concerned), as it shown in Fig.5, Fig.6, and Fig.7.

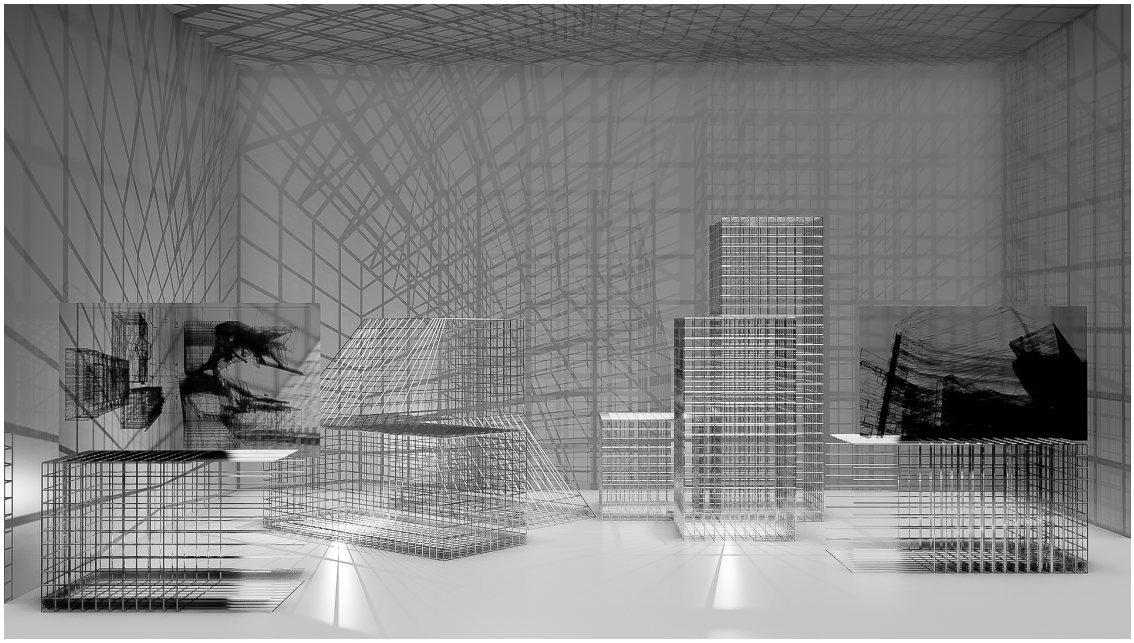

Fig.5: 3D render of the wire frame models - Perspective 1

[2] The videos are 1280 X 720, but since the buffer should be a power of 2 I reduce the incoming values.

[3] Chaos Generator are Supercollider objects based on different mathematics formulas.

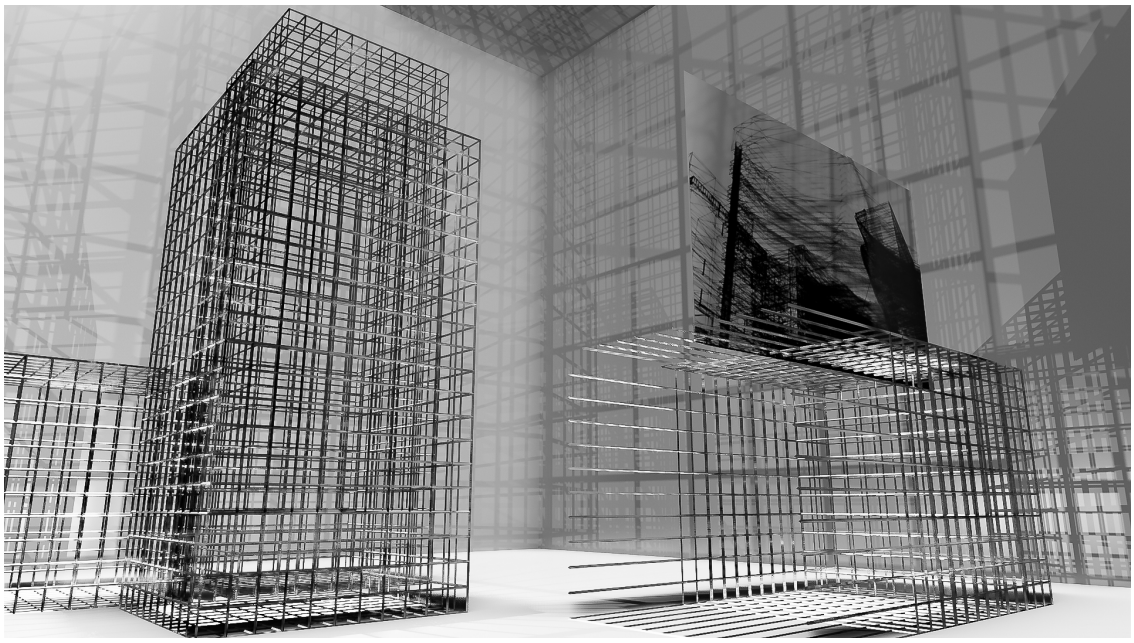

Fig.6: 3D render of the wire frame models - Perspective 2

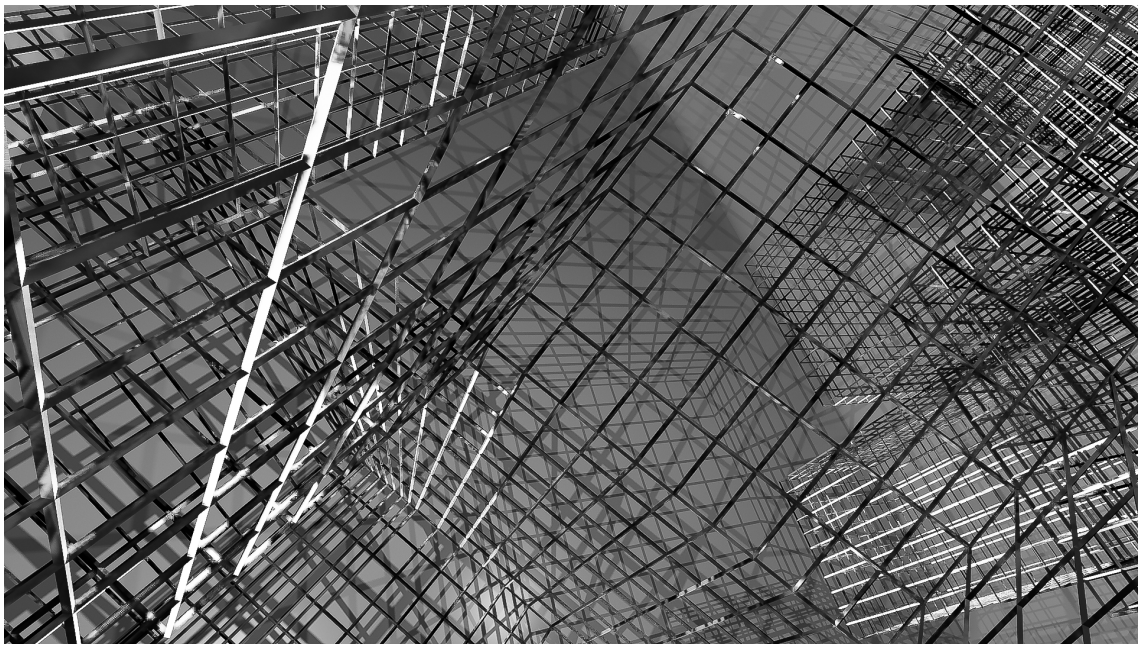

Fig.7: 3D render of the wire frame models - Perspective 3

It is important to underline how the wire mesh models dialogue directly with the elements present in the videos (an example can be seen in Fig.6). Moreover, real models can be seen not only as architecture but also as constituent elements of an architecture, since they are built with the same materials with which pillars and other components of a building are assembled. As in the models, also in the videos the process on which the audio process is based is connected, in a transversal dialogue, with the "raw" elements of an architecture. A further connection between video and real models lies in the use of architectural drawings, which appear in the video section of the project, ideally combined with the constituent element of the architecture represented by the wire mesh models and the numerical representation of the process on which the audio section is based (the visual representation makes the process transparent). The two sections of which the project is composed (the first made of landscapes and the second to architecture) are linked by short interruptions in which human elements appear in the videos. Whenever a video with people appears it is always showing people walking in a public space (Fig.8).

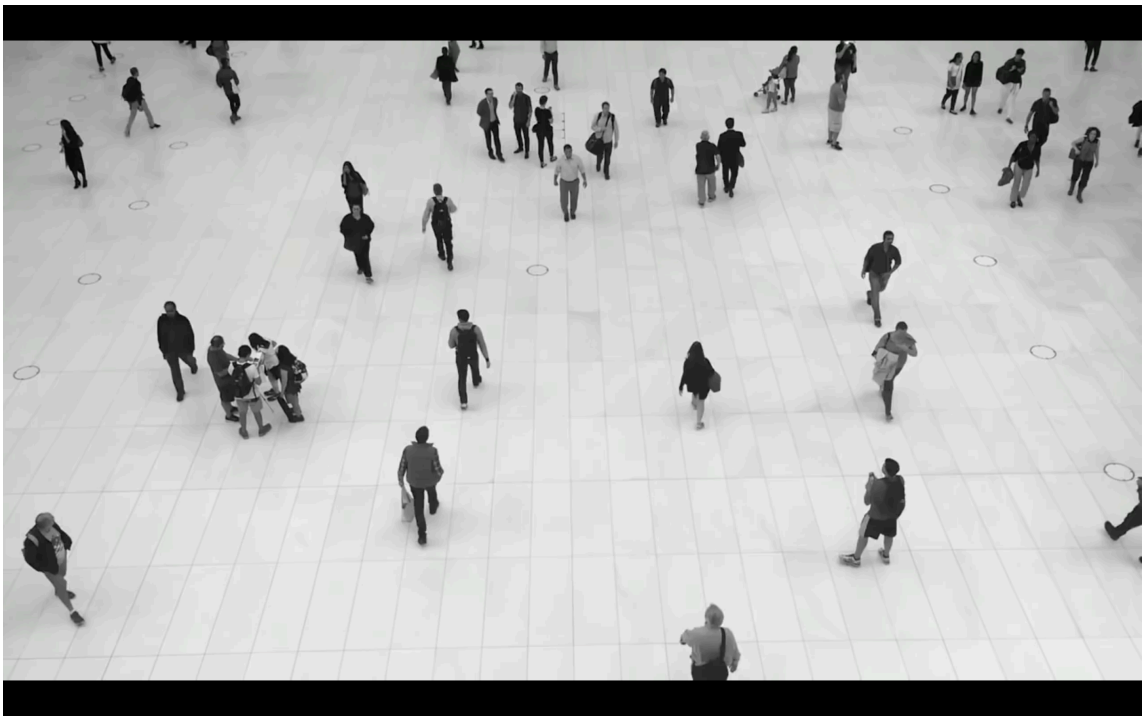

Fig.8: image taken from the project “Un_inverso”, showing people walking in the airport

2.2. Analytical aspect of the project *Un_inverso*

The project consists of a total of 18 scenes, divided into four groups (2 + 7 + 7 + 2). As mentioned above, the first section is dedicated to landscape while the second focuses on de- and reconstructions of architecture (form schema Tab.1, 2, 3 and 4).

INTRODUCTION	**Intro 1**	**Intro 2**
Video 1	Graphical Scanline representation	Numerical Representation Scanline
Video 2	Numeraical Scaline representation	
Lights	On	on
L.E.	**Chaos Gen**	**ChaosGen**

Tab.1: Introduction

SECTION 1	**Scene 1**	**Transition**	**Scene 2**	**Transition**	**Scene 3**	**Transition**	**Transion**
Video 1	Landscape Universe	People Walking	Landscape Earth		Landscape Earth	People Walking	
Video 2	Landscape Universe		Landscape Earth	Numerical Representatio n Scanline	Landscape Earth		Aereal images + Noise
Lights	off	Off	on	On	Off	Off	On
L.E.	**Scanline**	**Filtred Noise**	**Scanline**	**Chaos Gen**	**Scanline**	**Filtred Noise**	**Chaos Gen**

Tab.2: Section I

SECTION 2	Scene 10	Transition	Scene 12	Scene 13	Scene 14	Scene 15	Scene 16
Video 1	Architecture	People Walking	Architecture	People Walking	Architecture	People Walking	Architecture
Video 2	Architecture		Architecture		Architecture		Architecture
Lights	Off	Off	On	Off	On	Off	On
L.E.	**Chaos Gen**	**Filtred Noise**	**Chaos Gen**	**Filtred Noise**	**Chaos Gen**	**Filtred Noise**	**Scanline + processed pop song**

Tab.3: Section II

OUTRO	Outro 1	Outro 2
Video 1		Numerical Representation Scanline
Video 2	Numeraical Scaline representation	Graphical Scanline representation
Lights	On	on
L.E.	**Chaos Gen**	**ChaosGen**

Tab.4: Conclusion

From the musical point of view the first section is linked to the prevailing use of Scanline Synthesis. As the artist Marko Ciciliani explains in his paper *Scanline Synthesis as a signification method for digital images: techniques and aesthetics - a critical reflection*, "the basic principle of scanline synthesis is based on copying pixel values from a digital image into an audio buffer which is then used as the waveform for a wavetable oscillator. The pixels are usually read along a straight line in the image, but generally speaking an arbitrary grouping of pixels could be translated to a

waveform.” (Ciciliani 2015). Different artist used this synthesis technique in their composition such as Marko Ciciliani (*Formula minus One and Via 2*[4]), Ryoho Kobayashi (*Scanline Computer Music*[5]), Christopher Jette (*Soundlines*[6]) and Dave Poulter Scanline (*Granular Synthesis*[7]). Through OSC messages the pixel data read in Touchdesigner fill three different buffers in Supercollider, which correspond to the three channels "r", "g" and "b". Although the sound part is totally controlled by the video trend, a performer applies a live processes on the video, modifying the sound consequentially. The sounds generated by the Scanline Synthesis are characterized by a very high noise component, creating very dense sound textures. In order to give dynamism to the sound component I thought to control, always through the number values given by the pixels, the frequencies of the wave shaping, through PitchShifters. The result is a mixture between stable harsh drone sounds and very fast gestures. Given the "dense" nature of the process related to Scanline Synthesis I found it appropriate to associate it to the first section of the project, where only terrestrial landscapes and the universe from aerial perspectives are presented. The drone sounds present in the first section are characterized by slow glissandi, given by the slow movement of the videos. It is interesting to observe how this glissandi appears in the moment in which the videos is rotating on all the axis. Although the visual elements of the first video part are largely generated with 3D modeling, they carry the characteristics of real images. The use of a multiple video doesn't mean to contrast two different images or to associate two different elements present in the videos. They are conceived as two perspectives of the same element that is shown in the videos (but it is important to underline that they are not always shown at the same time), as shown in Fig.8. In many of the videos the screen is divided in two or four parts, displaying more then one video at the same time. The concept of "perspective" is also emphasized by the arrangement of the two screens resting on the wire mesh model, where the first one is close together to the public, while the second one is more distant (see Fig.5). As far as the shadows generated by the wire

[4] http://www.ciciliani.com/formula-minus-one.html

[5] https://vimeo.com/143388037

[6] https://cj.lovelyweather.com/_works/sndLines.html

[7] https://www.youtube.com/watch?v=ZfJj5_mKJOk

mesh models are concerned, they are used in both sections of the project. Their function, in addition to being visual material from which Scanline Synthesis generates sound, is to continuously provide a different perspective of how the observer experiences the performance. They are generated through the use of a total of twenty LEDs placed inside the wire mesh models. These are controlled through Arduino Due and Tochdesigner. The relationship between digital images and real images is also a fundamental point of the project. A source of great inspiration are the works of the audiovisual artist R.Kurokawa, who through the use of different media creates a connection between analog and digital material, as is possible to see in his project *ad/ab Atom*. The use of multiple screens arranged in complex configurations in the Japanese artist's project (e.g. twisted, as in his project *Oscillating Continuum*) suggested to me the idea of conceiving the spatial element (understood as the arrangement of objects in space) and their shape as structural. The spatial element in this project is also represented by the shadows of wireframe models, which, as they appear, create a meta-structure that encompasses all the elements of the project. They are often in motion (the LEDs being controlled by the audio component), thus creating different "perspectives" in which the project is observed. Another characteristic of the *Un_inverse* project is the idea that it develops autonomously at certain times. In fact, in some scenes, the video that is used to generate the audio part with the Scanline Synthesis is processed through the sound itself. The audio output of Supercollider is sent back to Touchdesigner so that it can control certain parameters of the video. In this way a sort of feedback is created between the two software, that guarantees a constant change in both the audio and the video elements. In the second section of the project, instead, the audio material is mainly associated to Chaos Generators, always implemented in Supercollider. They are characterized by the prevalence of sounds such as clicks, noises and sinusoidal sounds. The total of five different chaos generator are characterized by five different features: the first one is generating more rhythmical patterns, according to the videos, without changing the fundamental frequency. The second one works on the same principle but this time also the frequency parameter is controlled by the videos. The second chaos generator is the only one that is used just one time in the composition, more precisely in the last scene of the first section. The third chaos generator is more complex then the

other. Indeed is made of 4 different layers: bass, clicks, pitch-schifted clicks and noises. This one is the generator that I largely used in the second section. Unlike the first section where the landscapes are "read" in the second section, the vast majority of the videos are represented by the architectures and their constituent elements. The architectures are presented as wireframe models also in the videos, in close dialogue with the real wire mesh models. Unlike the landscape these videos suggested to me to explore the rhythmical aspects of sounds. This is why they are mainly used in the project to create rhythmic sequences and loops that vary according to the trend of the videos. In order to five coherence to all the elements of my project and combined them, in such a way as to make each step and each process used significant, I based myself on the three basic models of multimedia that Nicholas Cook identifies in "conformance, complementation and contest" (Cook, 1998, 98). He conceives multimedia as combination of similarity and differences, as shown in fig. 10.

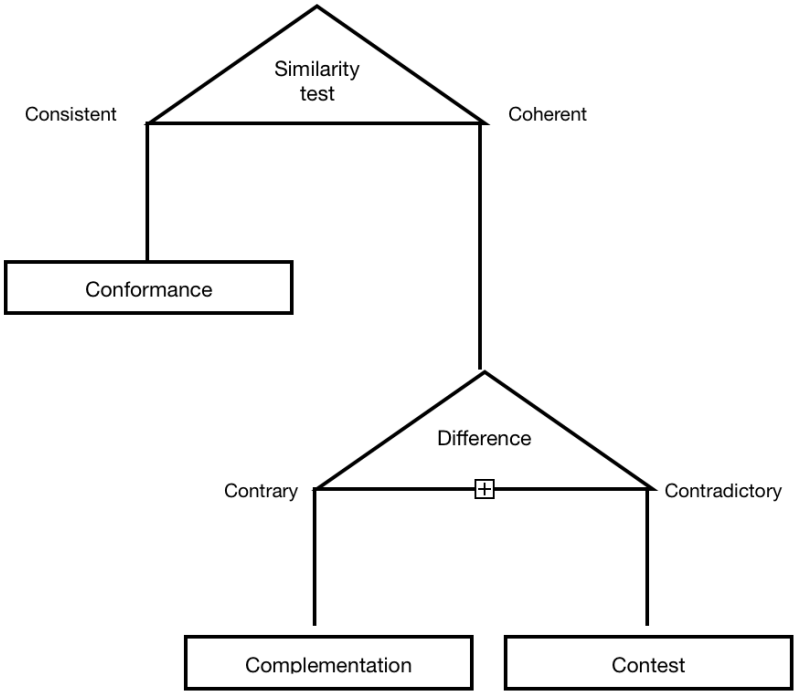

Fig.9: schema of the Cook's Similarity and Difference Test, taken from Cook, Nicholas. Analysing Musical Multimedia. Oxford & New York: Oxford University Press, 1998), 99.

2.3. Meta - structure: the role of shadow in the project *Un_inverso*

The shadow becomes matter and extension of the wireframe making it almost indistinguishable. It tends not only to be extensions of it but also the container of the whole project. And this is one on the focal point of my work. What it is contained can become a container and vice versa.

It is the shadow not the light that is the glue of the various levels in which my work develops, glue that works as if it were an analogical zoom. In this thing the shadow, enlarging the visual field, takes the observer away from the details of the work, giving a wider vision of the whole. It is when it disappears that the videos are put in evidence (even if in some cases the two levels are combined) and the observer gets closer.

The two kinds of visual media I'm using using (video projections and shadows of wireframes), put the observer in a condition to see the same thing but perceive it in a totally different way at different moments. The wire mesh models when illuminated are left to monolithic imagery, overlooked by their shadows that give a greater spatial element. While they become constituent elements of architecture when they are not illuminated but simply dialogue with the elements present in the video and sound. Speaking of perspective, it is necessary to mention the fact that the arrangement of the models is designed to be perceived in different way depending on the public perspective. Regarding this the models can be perceived as a single thing (almost like a group of buildings) or on the contrary as separate things (almost like different constitutional elements of an architecture). The shadows are a trace of the material of the models, therefore they represent an enlargement and amplification of their physicality. The two models that are closer to the audience lean inwards, as if they were incomplete, and then complete themselves with the models positioned inwards. The models closer to the public are designed to support the two screens for projection. However, it was not my intention to relegate them just to this function, but to make them a structural part of the project. They are therefore conceived as constitutive elements of the architecture.

3. The role of glitch aesthetics

3.1. Historical context

As mentioned briefly above, the prevailing aesthetic in my work is glitch, especially in terms of sound. As Colson Whitehead said “It is failure that guides evolution; perfection offers no incentive for improvement” (Colson Whitehead 1999).

As expressed by Kim Cascone in his writing "The aesthetic of failure: post digital tendencies in contemporary computer music" (Cascone, 2002, 329) internet has contributed enormously to the birth of new musical and artistic genres, among them glitch music. He points out how this "post-digital" aesthetic has developed in environments where a large number of technological elements were present: computer fans whirring, laser printers churning out documents, the sonification of user-interfaces, and the muffled noise of hard drives. The pivotal point, however, is that for the first time in history, technological objects are built before their possible uses are perceived (expecially in the artistic field). Being overwhelmed by hardware and software components has brought out the "failure" of digital technology, generating "material" of interest for composers to incorporate in their work, such as glitches, bugs, application errors, system crashes, clipping, aliasing, distortion, quantization noise and even the background noise of computer sound cards. The numerical nature of the most advanced technologies puts the artist, and mankind in general, in a position of apparent control. But the evolution of man and life itself is often the result of errors, deviations, accidents and singularities. The most subversive and contemporary creative gesture, witnessing the Human Presence, can be the creative control of error, the controlled deviation of numerical series into a dimension in which the human presence helps to curve time, to graft a colour into a sound, a cinematographic image into an aseptic texture, a musical sequence against the background of a tree, in a slower, purified and more meaningful way.

"Failure" became a prominent aesthetic in many arts at the end of the 20th century, reminding us that our control of technology is an illusion, and revealing that “digital instruments are only as perfect, precise and effective as the human beings who build them. New techniques are often discovered by chance or by the failure of a technique or an experiment.” (Cascone 2002).

By seeing "the error" of some new technologies we can say that later on composers do not stop only to the interest and use of raw materials but they tend to induce the error and amplify it. This is the case of Oval for example, a series of German experimenters, who began to draw images on the side of the CD to create "glitches", making them jump. Although the Oval are the first investigators of this aesthetic it's important to note that much of their work was previously done by John Cage and Christian Marclay, who manipulate vinyl records. As Kim Cascone reminds us, the work on the optical soundtrack by Laszlo Moholy-Nagy and Oskar Fischinger also anticipates the work of the Oval. Another example, in visual art, where the work of art is generated through the induction to error of new technologies is the artist Rosa Menkman. She is mainly concerned with highlighting visual artifacts created by "errors" in both analog and digital. The artist describes the glitch as “a wonderful interruption that moves an object from its ordinary form and speech to the ruins of destroyed meaning". As an interruption (real and/or simulated) of an expected or conventional flow of information or meaning within (digital) communication systems that results in an accident or a perceived error". (Menkman, 2015).

Concepts such as "detritus", "by-product" and "background" (or "horizon") are fundamental for the understanding of post-digital movement. “Think for example of the moment when painting begins to focus no longer on the element in the foreground, but on everything that is not, allowing them to capture the enigmatic character of the background" (Cascone 2002).

This helps us to understand how today's artists can examine the potential of technologies beyond their normal function.

According to Cascone, the birth of the post-digital language, even if later, can always be attributed to the Futurist movement and to the 4'33 composition by the composer John Cage.

> First of all, musical art looked for the soft and limpid purity of sound. Then it amalgamated different sounds, intent upon caressing the ear with suave harmonies. Nowadays musical art aims at the shrilliest, strangest and most dissonant amalgams of sound. Thus we are approaching noise-sound. This revolution of music is paralleled by the increasing proliferation of machinery sharing in human labor. In the pounding atmosphere of great cities as well as in the formerly silent countryside, machines create today such a large number of varied noises that pure sound, with its littleness and its monotony, now fails to arouse any emotion. (Russolo 1913, 5)

Luigi Russolo, an exponent of futurism, was interested in reviewing the way music was conceived, in relation to new technologies. He, among many experiments, was the inventor of an instrument called "intonarumori", which imitated urban industrial sounds. As with glitch music, the new sounds of cars, power lines, factories, telephones and electricity were a pool from which to generate new sounds in music.

It is therefore the questioning of art, seen as a negation of art itself, that is the focal point of Russolo's work and of the Futurist movement in general.

Just as in the musical field, also in the visual art field the aspect of negation of art has been fundamental for the post-digital aesthetics. As Andrzej Marzec writes

"The different negations of art consisted in questioning its classical vision and mission, they had first of all to oppose the representation and free the images from the constraint of representation. From now on, their main purpose will be their action: to disturb, distort and shift the existing worldview". (Marzec 2018, 31)

Another turning point, besides the Futurist movement, is represented by the American composer John Cage. He thought that is possible to compose music with every sounds. A resounding example is the 4'33" composition. This composition for piano, in three movements, 3 movements composed by silence alone. In fact, the pianist does not have to touch the keyboard but rather close and open the case to delimit the movements. In this way Cage brings the audience to concentrate on the "background", (background sounds). For Cage it was of fundamental importance to eliminate all the constraints imposed by what was considered music until that time.

After introducing a broad outline of what has allowed glitch music to generate itself, it is essential to talk about its actual birth. Around 1990, in contrast with the most widespread techno music, some DJs became familiar with the compositions of some of the contemporary composers like Karlheinz Stockhausen, Morton Subotnick and John Cage, as Cascone reminds us.

One of the first group that was interest in the new aesthetic was Pan Sonic. In their first work "Vakio" (published in 1993) there were unexpected sounds: industrial landscapes, drones, and high frequencies of sine waves. A shockwave for popular music of that period. Together with them the Oval project made a significant contribution to the first glitch experiments, as mentioned above, using the CD-skipping technique. Together with them also a group called Mouse on Mars was fundamental for the development of a post-digital aesthetic, even if with characteristics that recalled danceable music.
After those times other artists, such as Aphex Twin, LTJ Bukem, Omni Trio, Wagon Christ and Goldie experimented with all sorts of manipulation in the digital domain. From Data Bending processes, through the distortion of data raw files and the bit reduction. Later these experiments resulted in a real musical current represented by artists like Ryoji Ikeda, Mika Vainio, Carsten Nicolai, which they place themselves in a movement that I would like to call post-glitch.

3.2. A different perspective on *glitch aesthetic*

The glitch aesthetic, in addition to the concepts expressed in the previous chapter and its history, gives us a way to have a "transparent" idea of the functionalities related to new technologies. In addition to this, *glitch music* not only amplifies the problems of hardware or software but also provides us compositional material, that I personally consider "raw". By raw I mean that these sounds give us back the idea of an origin, like the basic sounds that can be imagined: clicks, sinusoidal sounds and noises. These sounds, which I largely used in my compositions, dialogue, both directly and indirectly, with the basic constituent elements of the architecture represented by wireframe models and the content of digital videos. The idea of glitch here is extended, indeed does not only refer to the use of the above mentioned material. In one of the last scene of my project the video presents wireframe structures of old buildings, which are in strong contrast with the architectural aesthetics that I used in the other videos. These images are associated, unlike all the other scenes, to the pop song of Calvin Harris and Rhianna

This Is What You Came For [8] (2016), processed through Supercollider. This could be defined as a "Stylistic Glitch", something that has nothing to do with the sound itself, but with the idea of inducing an “error” in the style that leads the whole work. To emphasize this idea the process used to distort the original song is the looping technique. In this case, the Pbind object generates a series of very fast and diverse loops with a chaotic character.

As said before, the videos are largely inspired by the works of R. Kurokawa, in which real images and digital images are combined and dialogued. In many of his works, such as *elementum #n* [9] (2018), *unfold.alt* [10](2016) we can see that the focal point of his work is nature. This is expressed in his audiovisual works through images of insects, humans, or microscopic components related to nature (nanoscience) combined with 3D modeling techniques.

> I mostly conceive an idea of artwork from nature. And natural law-physics is also an important element and becomes a trigger for my works. I’m feeling like treating physical law at the same level as treating nature itself. Although the laws of nature are governed by quantum mechanics for this time, I worked in the same way as treating other fields in physics data or natural phenomena. The theme of *unfold* was on stellar formation, so for *ad/ab Atom* the scale is opposite. It was a great opportunity to treat both micro and macro scientific materials to create different works. (Kurokawa 2017)

Another point of contact with the Japanese artist is definitely the aesthetics. I would define it as an extension of the glitch, more specifically post-glitch. It presents elements such as noise, distortions, interference, but in this case what could be classified as "error" is emphasized in such a way that it is no longer perceived as such. A fundamental aspect is the use of a strong human component, that is then processed, blurred or distorted, an aspect that is also reflected in my last work *Un_inverso*.

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[8] https://www.youtube.com/watch?v=kOkQ4T5WO9E

[9] http://www.ryoichikurokawa.com/project/elementum.html

[10] http://www.ryoichikurokawa.com/project/ualt.html

Besides Kurokawa, another Japanese artist played a very important role in the development of my project: Ryoji Ikeda. He focuses on the essential characteristics of sound and visual, as we can observe in works like *Datamatics*[11] (2006) or *Test Patterns*[12] (2008). From a sound point of view he uses sounds like noise, clicks and very high pitched sinusoidal sounds, embedded in a regular rhythmic frame. In particular two of his last works, *Micro-macro* (2015) and *X-verse* (2019) have influenced my work. "The two projections that make up Micro/Macro are in fact two separate works. Taking up a 20-meter-wide screen on the wall, one of the channels shows a suggestive sequence of movements through deep space, punctured occasionally by white specks that flash across the cosmos. The ground projection is roughly twice the size, and is of fast-moving patterns such as a scrolling grid and floating coordinates that accelerate almost imperceptibly into hysterical lines before morphing back into geometrical patterns that slide across the floor."[13]

The ways in which the viewer can experience the two works composed by Ikeda and the video components (mainly elements of the universe), have focused my interest to push me in the elaboration of a performance in which the potential experience of the audience should be at the center.

3.3. A materialist perception of sound

3.3.1. Sound as thing

Before introducing the aesthetic concept linked to my project, another fundamental point was to think of the sound no longer as something not tangible but as something that could be understood as material. This comes from my need to conceive *Un_inverso* project, not as a set of different elements, but as a whole. And given the prevalence of a materiality in the project I wondered if it was possible to perceive sound as matter.

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[11] http://www.ryojiikeda.com/project/datamatics/

[12] http://www.ryojiikeda.com/project/testpattern/

[13] http://artasiapacific.com/Blog/RyojiIkedaMicroMacro

The idea that sound is an object might sound unusual to as conventional objects stand and are handled whereas sound is fleeting, effuse and not ownable.

And it is therefore connected to an induction to the error of our perception of sound, since it is related to other elements. Sound can be perceived as tangible matter if it is connected and contextualized in a certain way[14].

As Michel Chion writes, the sound object "is a perception of a totality that remains identical through different listening; an organized unity that can be compared to a 'gestalt' in the psychology of form"[15] (Chion, 2009, 32). It is therefore objectivity that in his opinion can give a "material" value to the sound.

> "The concept of the sound object, initially formu- lated by Pierre Schaeffer, in many ways aimed to uncover a concreteness of lived aural experience that is overshadowed by signification." (Döbereiner, 2019, 218).

In Döbereiner's point of view, by drawing on concepts developed by Martin Heidegger and Gilbert Simondon, it is possible to give an alternative materialist concept of sound conceived as "thing". This idea is based on the independence of sound from a possible listener, shifting the attention to those processes and relationships of "material individuation that gibe rise to son identities" (Döbereiner, 2019, 218). As I underlined in the first part of this chapter sound, in my opinion, to be perceived as material, should be contextualized in a certain way. The concept of "concreteness of sound" has often focused on its "aerial" and mimetic nature of its possible representation. Döbereiner also offers us a perspective on the material potential of sound to give rise to forms through connections and interactions between machines, bodies, signals and ideas. An interesting idea that Döbereiner presents is the association between the dialectical concept expressed by Martin Heidegger's and the concept of the physicality of sound. The dialectic between meaning and signifier, according to Martin Heidegger's thought, is taken to a higher level. He considers the work of art as a "struggle" between the "creation of a world" and the "setting" (or production) of the "earth". This reflects the

[14] An example could be the contextualization of sound in a museum, where sound is conceived almost like a painting.

difference between meaning and materiality. The Earth denotes the material and non-significant basis of a work of art while the World is the significant context of the relationships that guide us. Matter is therefore no longer regarded as "a support". According to Heidegger both terms, which could allude to the same object, “exist only in relation to each other” (Heidegger, 2002, 24).

> "The stone as stone is no longer present in itself, but appears to the eye in its operation as an axe. Therefore, the materiality of the stone does not appear in itself, but becomes a support for another object." (Döbereiner, 2019, 218)

The association consists in identifying the sound, or its timbral physicality as the "land" in which the musical composition is developed. That is, the approach of conceiving the "sound itself" linked to Husserl's concept of "returning to things themselves" (Husserl 2001, 168), giving more importance to the immediacy of phenomenological experience. Schaffer, according to whom "the scientific study of sound is secondary with respect to the sound object as the ideal unit of perception" (Döbereiner 2019, 218) is in contrast to Heidegger's argument who supported the idea that the functioning of sound and its identity depend on its relationship to structure and formal contexts. As a conclusion we can say that sound exists in relation to its form and structure.

3.3.2. “Click” as the most materialistic perceptible sound

The sound element I use in most of my compositions is the "Click". From my point of view it represents one of the primordial elements to which the human being is bound and can be perceived, unlike sounds in general, as a material element. It is distinctly present both in the concrete world and in the digital world as an element belonging to every other type of sound. Asking myself why the strength of this sound on our psyche I have identified some possible phenomenological solutions. The first is that the click sound is the type of sound with respect to which we humans are able to orient ourselves perceptively in space, and the second is that it is one of the basic elements of the

language. In this regard Van Ginneken argues that language is generated and has its origin only from "Click sounds" (Langer, 1988, 304).

"He set up the still more curious theory that language, arising from a desire to converse, originally consisted only of "Click sounds" made with toungue and lips, then went though a phase of pure consonant structures audible only at close range."(Langer, 1988, 304)

From this point of view the origin of Click sound and its consequent "material" perception lies in the origins of language. It refers to the process of language generated by the single historical process that is their monogenesis in a "proto-world" or in an equally ancient language. Another interesting point of view in my opinion is the acoustic one: The shorter the click the more its frequency spectrum gets richer.

Click is the shortest sound that can be perceived and at the same time the sound that ideally could contains all the possible frequency.

4.1. Imperfection as a possible origin of art

When we talk about glitch we cannot thing about "imperfections" in my opinion. Glitch, outside the context within was born, represent today an idiom. In fact the "error" has reached a poetical level. "Errors" or "Failures" are taken outside the context of the technological instability and brought to a level in which errors can be connected to a sociological, political or even economical levels.

Post-glitch imperfection, from my point of view is not something static but a gesture, something dynamic, not tangible and difficult to identify.

The idea of thinking about imperfection as a possible origin of art comes from the idea that an object, such as a glass, in the moment it breaks, loses its function, and is catapulted into a dimension that denies the world of functions and returns a thought action that cuts through everyday life, leading the artist to see the delicacy and fragility

of the world. Imperfection is that action that undermines the principle of cause-effect control. The moment you want to drink water, you fill the glass. It is possible that by filling the glass this slips, and it is here that an added value of ordinary action is interposed: an unexpected one. The imperfection is "incalculable" or at least "unpredictable". In the real world this can lead to different reactions, i.e. imperfection can also take on a negative value, but this cannot happen in the digital world, where an error lives only in a positive temporal domain. Let's think of sound, when it distorts itself, in the digital world it has no consequence other than that of generating a new sound completely devoid of any context. In the real world, imperfection is not a process but an error encoding an action, while in the digital world this becomes the constitutive motive of a new object in the immediate future. Imperfection is therefore proper to everything that is a complex system of events, not classifiable.

As Yuriko Saito claims in his text “The role of imperfection in everyday Aesthetic” “Perfectionism impoverishes our aesthetic life because it limits the range of sensual qualities to be appreciated. Imperfect objects are usually characterized by irregularities, disorder, complexity and rough surfaces” (Saito 2017). The appreciation of imperfection is a concept that laid its foundations in the 18th century, especially with regard to architectural ruins. An example is given by William Gilpin with regard to Palladio's architecture:

> "if we want to give it picturesque beauty, we must use the hammer instead of the chisel, we must knock down one half, deface the other half, and throw the mutilated members into piles. In short, from a smooth building we must turn it into a crude ruin” (Gilpin, 1792, 7)

Gilping is embracing the concept of "aesthetics of ruins", with which it underline the beauty of complexity, irregularity and asymmetry, surfaces damaged by time and atmospheric agents.

Another well-known example of imperfection is the Japanese wabi aesthetic. Yuriko Saito explain it saying that: “Initially introduced as an alternative to the prevailing taste

for opulence and luxury, the wabi aesthetic also celebrates the irregularity, rough surface, asymmetry and defects in tea bowls, other utensils and tea huts."

There many contemporary artist who they introduced imperfection, irregularities, accidents in their works. The photographs Aron Siskind main focus for example black-and-white, close range, and aerial photos of surfaces and objects, with an emphasis on dilapidated houses and streets.

"Moreover, it is not surprising that many artists working with textiles, ceramics and metals express similar praise for imperfections, defects, signs of repair and the like, and create their works of art accordingly" (Saito, 2017).

Conclusion

This project represented for me a turning point, an evolution, i.e. the transition from a set-up that involved the traditional video-sound relationship, to a more complex set-up in which different elements and different artistic typologies interact with each other. I asked myself how it was possible to link the material element with immaterial characteristics of the wire mesh models, the purity or density of sound and the different videos used in this project. The perspective element became of fundamental importance, being the only parameter that allowed me to "give movement" to the architectures, through lights and shadows. A next step was to conceive also the space as a constitutive element of the project. Moreover, there is no univocal way of reading *Un_inverso*, based entirely on the perspective in which the observer benefits from the experience. As a stratification of elements connected together we find the materiality of the wire mesh models, with "immaterial" characteristics, and then move on to a "semi-material" element: their shadow generated by LEDs, and again the digitality of the videos (which between real and digital images), and then move on to the invisibility of sound, and the material perception that we can have of it.

References

- Antognazza, M.R. 2015. The Benefit to Philosophy of the Study of Its History, *British Journal for the History of Philosophy* , vol. 23, no. 1, pp. 161-184;
- Brandon C. Look, 2013, Gottfried Wilhelm Leibniz, at https://plato.stanford.edu/entries/leibniz/, (accessed: May, 10st, 2020);
- Čapek, M. 1961. Philosophical Impact of Contemporary Physics, *Van Nostrand*, p. 54;
- Ciciliani, M. 2015, Scanline Synthesis as a signification method for digital images: techniques and aesthetics - a critical reflection, *Pós-Graduação em Arte da UNB*, 91;
- Chion, M. 2009. Guide to Sound Object, at https://monoskop.org/images/0/01/Chion_Michel_Guide_To_Sound_Objects_Pierre_Schaeffer_and_Musical_Research.pdf;
- Cook, N. 1998. Analysing Musical Multimedia, *Oxford & New York: Oxford University Press*, pp. 98-129;
- Döbereiner, L. 2019. Towards a Materialist Conception of Sound as Thing, *Cambridge University Press;*
- Fontana, F. 2017. Where the laws of nature blurs: Interview with Ryochi Kurokawa, at http://digicult.it/articles/dove-le-leggi-della-natura-si-confondono-intervista-ryoichi-kurokawa/, (accessed: June, 1st, 2020);
- Gilpin, W. 1792. Three Essays on picturesque beauty; on picturesque travel; and on sketching landscape: to which is added a poem, on landscape painting, at http://quod.lib.umich.edu/e/ecco/004863369.0001.000/1:4?rgn=div1;view=fulltext, p. 7., (accessed: June, 1st, 2020);
- Husserl, E. 2001, Logical Investigations, Volume 1, *International library of philosophy*, at: https://philpapers.org/archive/HUSLIV.pdf;
- Langer, S. and Van Den Heuvel, G., 1988. Mind, *Baltimore: Johns Hopkins University Press.*, p. 304;
- Marzec, A. 2018. Postdigital aesthetics: an art of imperfection, disturbances and disintegration, *Eugenia Vilela and Filipe Martins & Barrors;*
- Menkman, R. 2015, Glitch Studies Manifesto, at https://pdfs.semanticscholar.org/0732/56f0c90a712365890f379f7dc55bd1377f3e.pdf;

- Young, J. And Haynes, K., 2002. Heidegger: Off the Beaten Track, *Cambridge University Press;*

- Saito, Y., 2015. The Role of Imperfection in Everyday Aesthetics, at https://contempaesthetics.org/newvolume/pages/article.php?articleID=797#FN5, (accessed: June, 13th, 2020);

- Tresoldi, E., The concept of absent matter, at https://www.edoardotresoldi.com/concept/, (accessed: May 5, 2020).