'L'enveloppe', of the depiction of impressions

Aixa Navas Valbuena

2020

'L'enveloppe', of the depiction of impressions

REINTERPRETING A CONCEPT
OF IMPRESSIONISM THROUGH PROJECTION
MAPPING AND VIRTUAL REALITY PROTOTYPES

Aixa Navas Valbuena

2020

MASTER THESIS

to achieve the University Degree
for Master of Science
in the study programme:
MediaArchitecture
under the
Faculty of Architecture and Urbanism

FIRST SUPERVISOR:
DR. PROF. EVA HORNECKER
HUMAN-COMPUTER INTERACTION
FACULTY OF MEDIA

SECOND SUPERVISOR:
DIPL.-ING. FH MATHIAS THIEL
EXHIBITION DESIGN & ARCHITECTURE
Studio asisi Berlin
CEO asisi F&E

BAUHAUS-UNIVERSITÄT WEIMAR

Abstract

Few art movements remain as current as Impressionism does. It placed the notion of capturing transience through painting, depicting subjects understood as perceptions, particularly as impressions. Claude Monet's Rouen Cathedral Series elevates this notion to a new level, representing the paradox of the momentary being built up over time.

Monet's letters during that creative process are testimony to what he pursued and referred to as the *enveloppe:* the same light spread everywhere. What he considered impossible to represent on the canvas surpassed the two-dimensionality of his medium, painting. In the digital age, how could this concept be interpreted through new media by using the immersive feature of three-dimensionality?

This academic work pursues to convey a depiction of the *enveloppe* through data visualization in a three-dimensional environment, with the use of two immersive media: virtual reality and projection mapping. In this way, two prototypes were built to visualize processed data of the Cathedral Series paintings, offering an immersive approximation to Monet's *enveloppe*.

Impressionism timeless appealing partly relies on the immersive feature of depictions that involve the painter's perceptions and our own as a part of the artwork. Instead of being object-centered, the concept of the *enveloppe* understood from its depiction through immersive media comes closer to the approach of art as an experience.

KEYWORDS: Monet's Enveloppe, Immersive media, Perceptions.

This book is dedicated to the person who
taught me the value of our own perceptions.
Gracias papá.

CONTENTS

———————

Foreword

During a visit in summer 2018 to Leipzig, I had the opportunity to get to know the work of an artist, whose roots lay in architecture. Without knowing what I would encounter, an exhibition thoroughly conceived led me to a 35 meters high rotunda, which in turn transported me to an entirely different place: the desolate underwater scenery of the largest shipwreck in history. But beyond that, I believe it led me to the confines of my own perception.

Nimbly blending analog and digital creative processes, Yadegar Asisi's artistic project elevates the communicating power of still images. Embedded in built spaces and enhanced through light and sound, his panoramas deliver stories that reflect on human nature. Above all, the underlying message is so clearly conveyed, that it seems impossible not to feel immersed in the whole narrative of the concept.
Thoughts about these oversized immersive installations followed me back to Weimar, back to the journey of understanding Media Architecture, and finding my path within this emerging discipline.

Driven by that experience and supported by the creative team behind Asisi's panoramas and exhibitions (asisi studio, www.asisi.de), the following academic proposal is thematically framed in the next project to be exhibited in Rouen's panometer: "The Cathedral of Monet".

Inspired by Claude Monet's pictorial series of Rouen Cathedral, Yadegar Asisi has depicted the west façade of this gothic building and its surroundings during the Belle Époque period, by the end of the 19th century. His oil painting is currently being developed to become a cylindrical panorama (asisi F&A 2020). What this tribute to Impressionist painting means will soon be interpreted by the public. However, already at an early stage of its development, the image he was painting triggered once again the same emotion experienced during that visit in 2018, *that same feeling of being transported.*

Figure 01. An everlasting impression, Panometer (Arena), Leipzig, 2018.

> **"**
>
> Every touching experience of architecture is multi-sensory; qualities of space, matter, and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscle. Architecture strengthens the existential experiences, one's sense of being in the world, and this is essentially a strengthened experience of self. Instead of mere vision, or the five classical senses, architecture involves several realms of sensory experience which interact and fuse into each other.
>
> **"**

The Eyes of the Skin: Architecture and the Senses (2005, Pallasmaa, 41).

There are place-related experiences, I believe, that lead to great awareness. What is there about consciously experiencing anything, and acknowledging *that very moment* that makes it so significant? Why do we hold memories of amazement in our minds differently as we do with the rest of incoming information?

Coming across these thoughts, I tried to recall early experiences, in which I consciously identified the feeling of wonder when perceiving the space around me. This vivid image comes to mind: walking with my father along narrow alleys of an open-air market we used to go on Saturdays. I remember staring at the colorful stands crammed with sacks of beans and nuts, baskets of fruits and shelves filled up with random objects. At some points, trees' reflecting shadows over the roof gave the feeling of motion in the ground, while gaps between the different tents —and probably some rips among them— let rays of light strike through.

Although I'm aware that those experiences might well have not happened the exact way I recall them, that type of memory makes me reflect on how some brief moments take such a large place in our mind; significant enough to stand over the rest. As a compendium of vivid images, some experiences get engraved with such intensity, that they end up influencing the relationship we develop with places, as well as our preferences and emotional bonds. This particular kind of mental content is what the empiricist philosopher David Hume designated as *impressions*.

"Those perceptions, which enter with most force and violence, we may name impressions, and under this name, I comprehend all of our sensations, passions, and emotions, as they make their first appearance in the soul." (Hume 1817, 21)

Of the depiction of impressions
The way impressions make their appearance in our minds is indeed far more intense than any other mental content.
Precisely because of this sense of the liveliness, and the momentary nature of the term 'impression' a whole art movement[1] was unwittingly named after: Impressionism.

By the end of the 19th century, a collective of artists came together united by the spirit of opposing to the paradigms of what art should

---

1   Although this genre made itself present in different expressions of art, including music, film, and literature, for the purpose of this academic research I will merely focus on Impressionist Painting.

be like according to the established institution of the time in France, the Académie des Beaux-Arts. By embracing modernity within their field, depicting what modern times meant for them, the protagonists of this influential chapter in the history of art went to be known as *the Impressionists.*

With a common ground defined by a different approach to art at the time —both regarding content and technique— French impressionists were revolutionary at recognizing a rapidly changing society and adapting their art to it. Urban transformation and technological advances determined this approach. Among these, the invention of photography was particularly influential.

However, if their approach was so different from classical painting, we may ask ourselves, *what did the impressionists depict*? Nor the city, neither its surroundings were just a mere background in the impressionist painting, yet, its citizens were not the main protagonists either. Instead, the painter's perception came to play a distinctive role. Rendering scenes wasn't by any means oriented to resemble aesthetics of finished classic painting, but to express the nuances of what a real moment behind the canvas would have felt like. Suddenly, painting wasn't all about the subject matter and how it was depicted, but the perception of the artist and a medium itself: *light*. Light depicted through color and color expressed through pure pigment.

Another significant feature of this innovative approach in painting was the serial practice: the same subject matter depicted several times usually from the same vantage point. Although this might sound contradictory, if —as stated before— the subject matter was meant to be a secondary aspect of the impressionist's painting, the whole logic behind this practice can behold on one of the key figures of Impressionism: Claude Monet.

Monet's life work marked a groundbreaking approach in painting until that point in history. His arduous experimentation with color and deep understanding of light have influenced numerous artists and art movements like the Bauhaus, and consequently art as we know it.

One of Monet's most complex and acclaimed series are his paintings *of* the Rouen Cathedral, and it is to be noted that 'of' might not be the right conjunction in this case. At this point of his career, Monet's ambitious aim when depicting more than thirty times this masterpiece of gothic architecture was allegedly not to paint the building itself, but to achieve a concept that exceeded materiality: the *enveloppe*.

What he felt, was presumably greater than what he beyond his undoubtedly exceptional painting skills could visually depict with oil painting. In a similar way that —according to Hume's theory— we are not physically able to replicate the vivacity of an impression merely by recalling the moment when it appeared in our mind, Monet struggled according to his biographer and his letters with the very impossibility of rendering what he was perceiving. It seems that despite his inner struggle on pursuing something that he considered impossible; he spent the rest of his life depicting these impressions.

Transcending the canvas
All the above has been said before in one way or another. However, what motivates this academic research are the connections that arise between the very idea of visually depicting an impression, and the possibilities of reinterpreting this, using media of our time. For the sake of clarity, when referring to *media* this text solely remains within the frame of arts.

In the path of understanding what *media architecture* is about, I have come across terms such as medium, data visualization and immersive media. Terms that add up to the already complex nature of architecture as a discipline, *to convey a certain message*, making use of embedded technologies and the architectural space per se.

From my understanding, media architecture is meant to transcend the materiality of architecture as we know it. In this sense, *spaces afford content in the form of light, sound, image, motion*. This, in my opinion, constitutes the very essence of this emergent field, and all

applications triggered by these affordances can be found within the intersection between media and architecture, covering a broad spectrum of possibilities.

From this approach, and as an attempt to better understand the concept Monet referred to as *enveloppe*, I pursue to explore different possibilities of data visualization in a three-dimensional environment with the use of digital/physical tools, and two immersive media: projection mapping and virtual reality. Due to the range of ambiance qualities that the pictorial series of the Rouen Cathedral offer, I aim to gather and develop measurable information from the paintings (i.e. RGB values) and the architecture of their subject (point cloud model) to visualize them as an approximation of the 'enveloppe' concept.

For ease of reference, the topics that follow are organized into two chapters. "Of the depiction of impressions" comprehends a theoretical background intended to provide context on Impressionism and introduce the concept of the *enveloppe*, as well as their relationship with immersive media. "Transcending the canvas" documents the prototyping process of the project that derived from it. The methodology of this process can be followed throughout the figure captions along the graphic documentation in this chapter.

In no way whatsoever, this academic work is meant to replicate or strictly analyze Monet's artworks from a technological point of view. Instead, the aim is to understand the relationship between *that*, what the impressionists rendered with oil painting and Hume called impressions and *that*, what through our current means may be depicted as such.

"

The atmosphere interposes between
our eye and the appearance of the
sea figures, the flowers, the fields.
The air visibly bathes every object,
coating it with mystery, enveloping it
with all the colors, muffled or bright,
that it has carried along before
arriving at it.

"

1889, Mirbeau on Monet's paintings at the
Exhibition with Auguste Rodin
(Geffroy, 1922, 120)

OF
THE DEPICTION
OF IMPRESSIONS

Hume's Impressions

The term impression entails more than one meaning. In general, an impression is "the action or process of impressing, in various senses". Among these senses, an impression can be "a mark produced upon any surface by pressure", but also "an imitation or impersonation of a person or thing, done by a comedian as a form of entertainment" ("Impression, n." 2019). Despite how conversely different these senses of the term may sound, they both result in leaving a mark.

For the purpose of this research, the particular denotation of the term refers to an effect. An impression is "an effect produced on the senses; a sensation, or sense-perception, in its purely receptive aspect", in particular, "...a strong effect, produced on the intellect, conscience, or feelings". ("Impression, n." 2019)

Despite its many denotations, one can barely address the term impression without coming up against the theories about human nature of the 18th-century Scottish philosopher David Hume. Considered as one of the most influential voices of his time[1], his works

are framed in the idea that human knowledge is entirely based upon experience, and experience is built-up out of perceptions. This current of philosophy is called empiricism.

Hume refers to *perceptions* as any mental content whatsoever. Attempting to understand the account for the mind's operations, Hume wants to find a set of laws that explain how these mental contents essentially shape our thought, belief, feeling and action. He states that everything we believe is ultimately traceable to experience (Morris and Brown 2019). From this empiricist approach, Hume extensively reflects upon perceptions as the machineries of all our vital experience.

He divides perceptions into two categories: *impressions and ideas*, both being mental content differentiated by the "degree of force and liveliness, with which they strike upon the mind, and make their way into our consciousness". (Hume 1739, 21) *Impressions*

---

1   Hume's influence is recognized in the works of other philosophers, such as Adam Smith, Immanuel Kant, and Jeremy Bentham, as well as on Charles Darwin's theory of evolution, as stated by Darwin himself.
His philosophical project is deeply influenced by Newton's scientific method.
In the field of philosophy Hume is considered as an empiricist, an absolute exponent of naturalism, as a precursor of contemporary cognitive science, and as a central inspiration to contemporary moral philosophy.

"

Those perceptions, which
enter with most force and
violence, we may name
impressions, and under this
name, I comprehend all of
our sensations, passions, and
emotions, as they make their
first appearance in the soul.

"

1817, Hume D., *Of the Origin of our Ideas.*
A Treatise of Human Nature.

Figure 02. Previous page: An impression of sensation could be a flavour.

Figure 03. Opposite: An impression of reflection could be a sentiment.

Figure 04. Above: Ideas and Impressions.

being the first and -by far- most intense type of mental content, include our sensations, desires, passions and emotions. On the other side, he states that *ideas* are the faint images of those impressions.

According to Hume, all our simple ideas are directly retrievable to simple impressions, but regardless of how vivid our ideas may seem like in our mind, they can never replicate the level of intensity that our impressions convey. Similar to the difference between *feeling* and *thinking*, recalling a moment (*idea*) doesn't lead to the embodied experience of that moment (*impression*). As an example, he identifies our inability —in most cases— to physically perceive any color, replicate any taste, or feel any sensation only by thinking on them (Morris and Brown 2019).

Among impressions, Hume distinguishes two kinds: *impressions of sensation*, or *original impressions*, and *impressions of reflection*, or *secondary impressions*.The feelings we receive from our five senses, as well as pains and pleasures are *original impressions* [Figure 02]. He calls them original because trying to determine their ultimate causes would take us beyond anything we can

experience. On the other hand, *impressions of reflection* are those reactions or responses to *ideas*, such as desires, emotions, passions and sentiments [Figure 03]. Hume's theories deeply reflect on the influence of sentiment over reason. Ultimately his entire philosophical project gives more insight about the account of our mind in terms of feeling, as it does in terms of thinking.

How impressions appear in our mind is indeed far more vivid than any other mental content. According to Hume, impressions are the intermediate result of experience, and experience gives origin to our ideas. Similarly, in an artistic process, regardless of methods or technicalities, *motivations usually rely on emotions and experiences.* In this way, narrative behind artworks is usually triggered by a certain moment. This instant could be an embodied experience of the artist that causes an *original impression*; but it can also be a reaction to a particular idea, appearing in the way *impressions of reflection* do. For this reason, these "trigger moments" behind artistic processes could be understood, to put it bluntly, as nothing else but impressions, impressions that are later depicted through a medium to convey the artist's own perceptions.

Embracing modern times: Impressionism

———————

"

Ah-ha!" [...] "Is that brilliant enough, now! That's the impression I get, or I don't know about it... But please, tell me what those 'black tongue lickings' at the bottom of the painting represent!"

"Those are people walking along," I replied.

"Then do I look like that when I'm walking along the boulevard des Capucines? Blood and thunder! So, you're making fun of me at last?

"

Leroy L., *"L'Exposition des Impressionistes" in Le Charivari.* (Leroy 1874)

After visiting an exhibition organized by the Anonymous Society of Painters, Sculptors, Printmakers, etc., (*Société Anonyme des Peintres, Sculpteurs et Graveurs, etc.*) the critic Louis Leroy published a satirical review in *Le Charivari*[1], unwittingly giving a name to the art movement we now know as *Impressionism.*

The initial association Leroy established with the term *impression* was firstly coined under a derisive connotation due to the title of Monet's painting 'Impression: Soleil Levant' [Figure 07]. Despite this derision and their diverse approaches to painting, this group of independent artists shared a common purpose and appropriated the term. To history, they are known as *the Impressionists* (Samu 2004).

By the time, only pieces selected by a jury of the Académie des Beaux-Arts were exhibited yearly at the "Salon", which was the government-run official exhibition [Figure 08]. This dictated at the time how art -worthy of being exhibited- was considered to look like. Less worthy submissions according to that jury were either presented in a different room (Salon des Refusés) or entirely rejected. In 1874, unsurprisingly and because of their conversely different approach, artworks submitted by

———————

1   "Le Charivari" was an illustrated satirical magazine issued in Paris between 1832 and 1937. (Philipon 1832)

this collective of artists[2] were refused to be exhibited, even if earlier submissions from some of these painters were accepted for other years (Rubin 1999, 16). However, far from discouraging them from showing their work, this became a common ground.

The Impressionists defined individual diversity within collective unity, but above all, they were innovative. By embracing modernity within their field, they depicted outside of the studio what modern times meant for them. This involved the city and its surroundings both as subject matter, and as scenery where modern life was taking
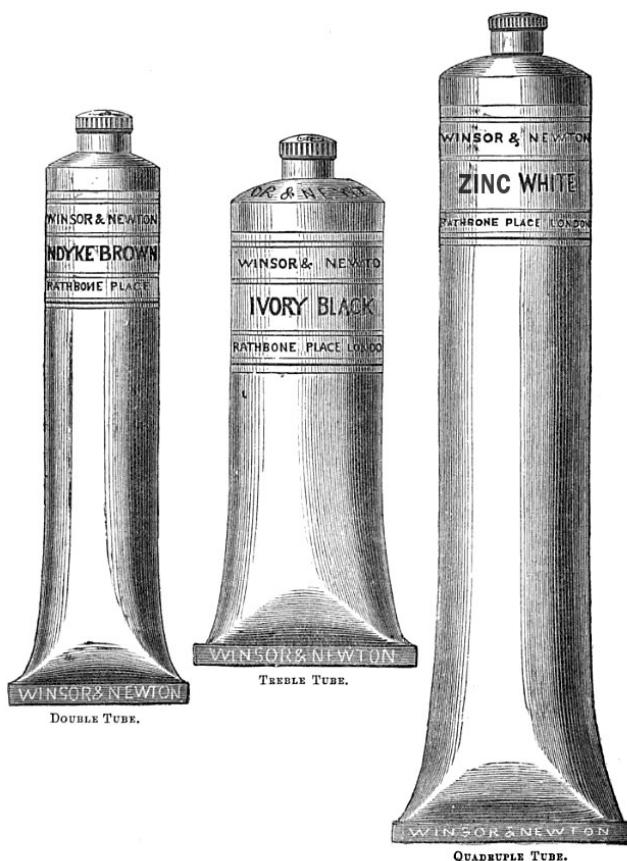
place. In this particular context, the concept of *modern life* was framed by urban transformation, social changes, and technological advances.

On one side, France was revitalized after the renovation efforts that followed the Franco Prussian war. This implied new social dynamics, in which middle and upper class were arising [Figure 09], giving space to something that the industrial age had let aside: time for leisure. As a result of this, a greater portion of society was now present in places conceived for recreation and relaxation (Tucker 1995, 74–75). On the other side, when impressionists started painting, industrial expansion flourished, with the construction of bridges, roadways, railways, (Rubin 1999, 24) and emerging architectural typologies such as train stations, which were giving visibility to technologic accomplishments of those modern times.

Among these accomplishments, the development of metal paint tubes [Figure 06] became a great advantage to the Impressionists, facilitating *plein-air* painting with oils. However, contrary to some statements that elevate the importance of this invention to a conclusive cause for impressionism, "the development of this style and technique of painting is a far more complex affair, and cannot be attributed simply to the ready portability of materials". (Callen 2000, 105–7)

Painting technique played an essential role, though. "Sketch-like brushwork, lack of conventional drawing as well as modeling and composition, and especially, unconventionally bright, juxtaposed hues" [Figure 16] were technical devices that became a signature style of the movement[3] and means to depict the 'impression'. (Shiff 2014, 16)

Figure 06. Winsor & Newton "Rand's Patent Collapsible Tube".

Figure 07. Monet's " Impression: Soleil Levant".

Figure 08. The Salon of 1852.

Figure 09. Paris, France, late 19th Century.

Color and its application played a role during impressionism that outstands many other features. In the art field at the time, notions of line and color were very distinctive. In the Academies was taught that line was related with reason, as its lack of materiality defines a form. Color, on its side, as matter itself and used to create effects to the eye, was rather associated with the senses. Painting techniques of the impressionists put aside drawing as the basis of form to let color take the main role. Defining forms directly with paint was opposite to the classical approach and tremendously innovative. (Rubin 1999, 34) For this reason, it is often said that impressionist painting is all about color.

Another relevant factor that came into play for the impressionist movement was the way art was being shown. That early exhibition in 1874 wasn't only crucial to art because of its content; it was crucial because of its 'display'. As mentioned before, the Salon of Paris was at the time the official institution for exhibiting art. For the artists, having their work exposed at the Salon implied recognition and success. There, paintings were crammed frame to frame in the walls, rated with medals and privileges, but also diminished when not matching conventional standards. However, when the room for rejected submissions (Salon des Refusés) was implemented by Napoleon III, pieces that were not meeting these standards also acquired visibility (Holt 1983, 11).

As stated before, rejection from the Salon became a common cause among this group of artists. Yet, some of them

Figure 10. Satirical caricatures by Cham and Draner in Le Charivari, 1874-79.

Figure 11. "Impressionist exhibition: Impressionist painting, a revolution in painting, that begins with terror"".

Figure 12. "Mr. Impressionist Painter, where have you learned your art? - At the morgue!".

Figure 13. "Formerly refused, previously realist, ex-impressionist, intentionist, luminist, currently nihilist.".

Figure 14. Daguerreotype of Louis Daguerre by Jean-Baptiste Sabatier-Blot.
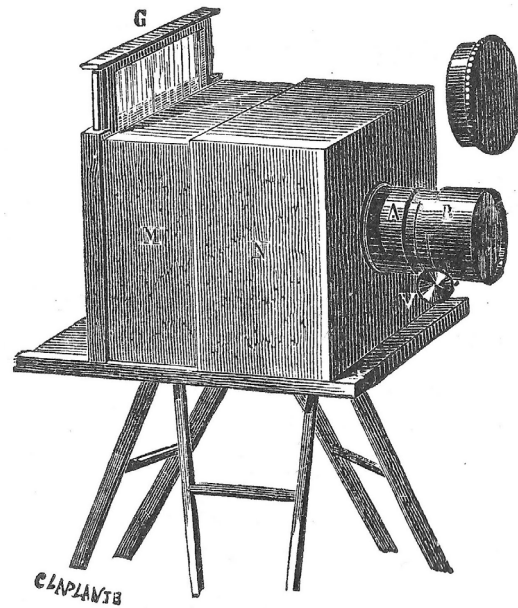
Fig. 327.

Figure 15. Graphic representation of a daguerreotype.

already shared a group identity. By the time they came together as collective, the need to showcase their artwork despite –and because– of the Academy's narrow standards became pertinent. Although the idea of independent exhibitions wasn't completely unknown by then, the eight events organized between 1874 and 1886 by the '*Société Anonyme des Peintres, Sculpteurs et Graveurs, etc.*'[4] were innovative for several reasons. Locations varied, but they were always set in the commercial heart of Paris and financed by an economic cooperative, that would later share any profits (Rubin 1999). Offering a liberal alternative to the Salon in terms of artistic approach and equality among the artists, their pieces were displayed leaving space -both physically and figuratively- for critics and possible purchase. These exhibitions were never focused on a particular style, but at gaining public recognition and financial feasibility, *while triggering discussions around art, not only from insiders.* If this concept sounds familiar is only because it led to the current form museums and galleries present art, the one we know today.

4   The impressionists cannot be listed in a definite roll, but in the run of those twelve years, the group that took part in these independent exhibitions encompasses fifty-seven artists. The only one who presented his artwork in all of them was Camille Pisarro. Degas and Morisot followed. Monet exhibited in the first four of them, and then again in 1882.

New media, new approaches.
The idea of detaching art from the tight conventions that institutions established, and making it somehow more democratic, was at its core, remarkably modern. But without a doubt, the achievement which invention deeply influenced the birth of Impressionism and set a milestone to modern times was a new medium on itself: photography. As in the case of many other great inventions, photography was a multiple discovery. In England, Henry Fox Talbot had been developing a process, while simultaneously a technique was being conceived by the romantic painter Louis-Jacques-Mandé Daguerre [Figure 14] in France (Rubin 1999, 32). In 1839, his 'daguerreotype' was announced to the world and went to be known as the first commercially successful photographic process in history (Daniel 2004).

On the one hand, the revolutionary invention of photography took over the portraying feature of painting and eventually made it affordable for everyone to have a portrait done. Among other reasons, due to the level of accuracy rendered in the images, many acclaimed this new technique and even saw photography as a replacement to painting. Nonetheless, others considered it as a mere mechanical technology without any artistic value whatsoever. For this reason, the shifting of some painters into

Figure 16. Previous spread, left. This 'technical devices' are evident in this painting by Renoir.

Figure 17. Previous spread, right. Degas, for instance, influenced by photography, experimented with the 'cropping' technique, avoiding conventional composition.

Figure 18. Right. Berthe Morisot, i.e. portrayed a wide range of subjects —from landscapes and still lifes to domestic scenes and portraits.

this new craft was criticized, pointing them as unskilled and lazy. Their use of photography to improve the realism of their paintings was in general under-valued. (Friedemann 2017, 11–14)

On the other hand, the practice that allowed capturing light to produce durable images seemed to make possible, what painting would not: *instantaneity.* "In photography, one could say that nature made its own impression, through the intermediary of light" (Rubin 1999, 32). This feature was probably its most celebrated one: capturing the image of a specific moment with a level of accuracy never seen before. And this precisely, put into a quandary *the role of the painter*, by questioning whether realistic depic-tion was still a reasonable approach to painting at all [Figure 16].

If their relevance were to be reduced to a single aspect, it would have to be that of being able to capture the essence of their era not only through what they painted, but especially through how they painted it. To this regard and turning back to how the first of the so-called *impressionist exhibitions* was taken by the audience, it wasn't all *"Blood and thunder!"*. After Leroy's satirical review was released, another critic, Jules-Antoine Castagnary wrote:

"These are everyone's personal notes. The common views that bring them together as a group and make them a collective force in our disintegrated age are the bias not to look for the

rendering, to stop at a certain general aspect. Once the impression is grasped and fixed, they declare their role over. The qualification "Japanese"[5], which was given to them at first, made no sense at all. If we want to characterize them with a word that explains them, we will have to coin the new term 'Impressionists'. They are impression-ists in the sense that they render not the landscape, but the sensation produced by the landscape. The word itself is in their own language: it is not landscape, it is the impression that Mr. Monet's 'Le Soleil Levant' refers to in the catalog. In this way, they leave reality and enter into the realm of idealism" (Castagnary 1874).

Despite their individual –and some-times differing– approaches and aesthetics [Figure 18], what generally stands out in the work of the Impres-sionists as a collective is perhaps what still makes it so current: understanding their role at the time and rendering their own perceptions as an important part of the pieces, as a visible feature in their paintings.

5   Refers to the Japanese woodblock prints, rec-ognized as an initial influence for Impressionism. (Richman-Abdou 2017)
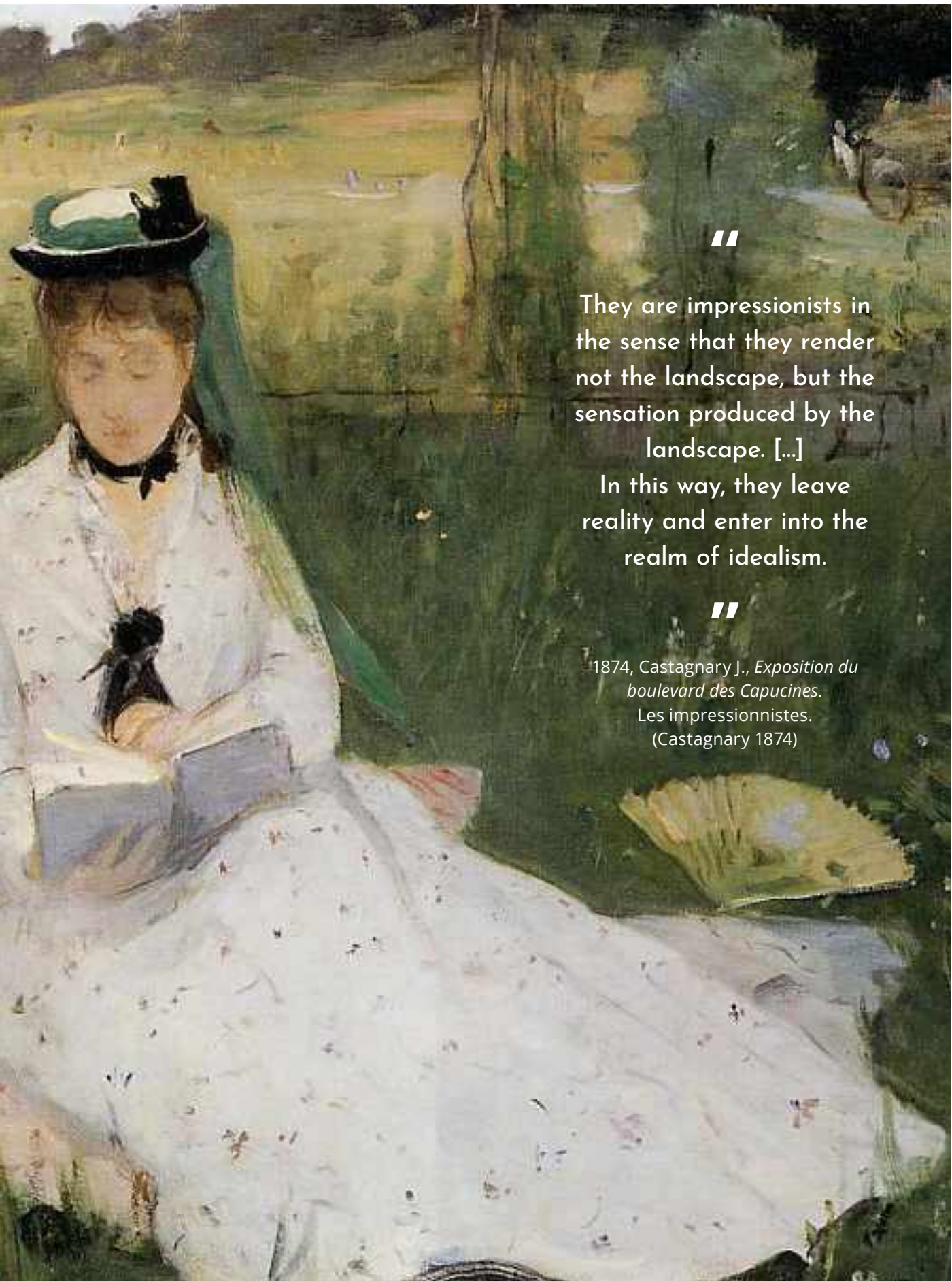
> **"**
>
> They are impressionists in the sense that they render not the landscape, but the sensation produced by the landscape. [...]
> In this way, they leave reality and enter into the realm of idealism.
>
> **"**

1874, Castagnary J., *Exposition du boulevard des Capucines.* Les impressionnistes. (Castagnary 1874)

Subject matter: the 'impression'

When the impressionists had taken from their immediate predecessors of the French school the direct manner of painting in the open air, all at once, by application of vigorous strokes, and when they had understood the new and daring methods of Japanese color, they departed from these very points, attained for the development of their own originality, and abandoned themselves to their personal sensations.

1878, Duret T., *"Les peintres impressionnistes".*

Figure 19. Two distinctive depictions of the same 'impression'. Sitting side by side, Auguste Renoir [author of this painting] and Claude Monet [Figure 21] painted at the same time this scene of 'La Grenouillère'.

Théodore Duret[1] summarizes the impressionist achievement in those thoughts. Regarding this matter, he states that every artist develops an individual style that enables one to render nature as it is. From this approach, *the painter is a liberated finder, instead of a maker* (Shiff 1984, 88). French impressionists, at least those most devoted to the idea of instantaneity, pursued to depict in their canvases the very act of perceiving the scene, regardless of their subject matter. In a way, if the painter becomes a part of the piece through the depiction of the own perception, the creative process could be understood as a sort of symbiotic happening.

Rendering an individualized experience and, at the same time, pursuing to capture a sense of reality has been widely discussed because of the contradiction it implies. Author Richard Shiff reflects on how can someone come to understand this contradiction, which seems to be the core of understanding Impressionism

itself[2]. Agreeing with early critical comments on the purpose of this art, he states that it relies on the substitution of means for ends (Shiff 1984, 16). In other words, this suggests that the process of impressionist painting can be already considered its purpose.

Impressionism is often differentiated from other currents of art by the manner it takes to render nature, or rather, to render the 'impression'. This manner refers to a topic that was often mentioned in theoretical and critical documents at the time: the '*vérité*' or expression of a fundamental truth. By aiming to depict nature's 'truth', the impressionist approach wasn't new, what was new though, was their concern about depicting the 'impression'. For them, this concept provided the theoretical basis to approach the relation of individual and universal truth. Their 'technical

1   French journalist and art critic. Duret was one of the firsts to extensively reflect in support of the impressionist movement and documented specific technical procedures of Manet, Monet, Pissarro, and Renoir.

2   Richard Shiff centers his analysis on Impressionism in close relation to Symbolism.
Symbolism is a sort of literary sibling of the impressionist movement, which emerged in parallel and shared many of the initial motivations and concerns that impressionists had.

devices' (sketch-like brushwork, unconventional composition and application of color) would be the very practice of their theory of the impression. (Shiff 1984, 17)

As in the case of perceptions, any regard on the impressionist approach can't be detached from its subjectivity. The 'verité' or truth of which it was spoken in French art criticism had a double sense. On one side, it referred to the fidelity of truth to nature, and on the other, to the artist's temperament and emotions. Shiff indicates that impressionist art was often related to both kinds of truth, or what's the same, the two connotations of the term, one objective one subjective.

If depicting the 'impression' is to be seen as representing the artist's very own perceptions while conveying the reality of nature, this could be understood as the fundamental truth. In this sense, "an art of the impression (or of sensation) may vary greatly from artist to artist, in accord with the individual's physiological or psychological state or, in other terms, with his temperament or personality. *Whatever truth or reality is represented must relate to the artist himself as well as to nature*. Indeed, one might say that the artist paints a 'self' on the pretext of painting 'nature'" (Shiff 1984, 20)

At this point, it is clear that the way these painters rendered scenes wasn't by any means oriented to resemble the finished aesthetics of classic painting to convey reality. To do so, they focused on expressing the nuances of what a real moment behind the canvas might have felt like. Their art was alluding, in this way, to the search of both individual and universal truth. From this approach, it can be stated that their finished painting was intended to be a *visual depiction of their impressions.* By such means, the process behind the painting celebrated an unseen feature in it: the artist's perception and the painting process as both means and end.

Figure 20. 'La Grenouillère' was a popular middle-class establishment. Both, Monet and Renoir recognized it as an ideal subject for the images of leisure they hoped to sell.

Figure 21. In each case, Monet's and Renoir's depictions represent their very own perceptions.

Monet's Series Painting

"

Last year... I often followed Claude Monet in his search of impressions. He was no longer a painter, in truth, but a hunter. He proceeded, followed by children who carried his canvases, five or six canvases representing the same subject at different times of day and with different effects. [...] And the painter, before his subject, lay in wait for the sun and shadows, capturing in a few brushstrokes the ray that fell or the cloud that passed...

"

1886, Guy de Maupassant.
Etretat (in Seitz 1960, 20)

Long before series paintings were to be a known practice in the art field, an impressionist artist devoted much of his lifework to repeatedly depict the same subject differentiated only by formal factors –such as color and composition– under varying lighting and weather conditions. Claude Monet (1840-1926) was a key figure of the impressionist movement and indeed the first painter to ever conceive,

Figure 22. Between 1890 and 1891 Monet realized around thirty paintings of the haystacks in a field near his house at Giverny. These were the first group of paintings that Monet exhibited as a series. In 1891, fifteen were shown at the Galerie Durand-Ruel in Paris.

Figure 23. Also in Giverny, Monet began four almost identically scaled canvases showing poppy fields.

Figure 24. Though, the painter did not consider these to be a series.

execute and eventually exhibit paintings in large series (Tucker 1995, 139). He did so not to become more skilled in the trade, but with a clear intention of understanding the light phenomenon through its visual depiction. Grainstacks, poplars, the cathedral of Rouen and the lily pond in his garden at Giverny were the subjects that Monet developed most intensively through his pictorial series, along the distinctive phases of his prolific lifework.

Monet's depictions of the Gare Saint-Lazare train station in 1877 have been often cited as his first series paintings, or at least as forerunners to this new format (Tucker 1990, 28). However, what set the ground to utterly develop this new approach was the personal and professional journey he undertook in the following years. For this reason, and to fully understand the motives of Monet's series painting, one must take a glance of what the period before the *Fin-de-Siècle* (end of the 19th century) meant for the artist.

The decade of 1880 was a time in which the narrative and continuity, tradition and contemporaneity of avant-garde painting -led by Impressionism- was deeply questioned. (Tucker 1990, 17) Some critics consider it to be a time of crisis for the movement, while others see it as an evolution. Many of the original

members were no more participating in the independent exhibitions and lead figures such as Renoir were growing apart from the movement. Either case, the 1880s are associated with a time of change and challenge for Impressionism.

Before that, in 1878, Monet moved with his family from Paris to Vétheuil[1], and there, committed himself to what he probably knew best at the time: painting outdoors. The change of environment was noticeable in his paintings, which now had a more solitary and harmonious character compared to his previous works in Paris and Argenteuil. No human figures, no urban scenes or factories to be seen along the bank of the Seine. The ease of these images, together with how many he did only in his first year in the village, suggest that it was a period of contentment for the painter, at least when painting. Through his letters to friends and collectors though, it was clear that his personal situation was very different. He often claimed to be financially broke, felt ashamed for finding himself in that situation at his age (38), and was worried about his wife's health after giving birth to

_____

1   Vétheuil is a picturesque village, located around 60 km north of Paris and, in comparison to Monet's previous locations along the Seine, it was noticeably less developed and populated.

Figure 25. To complete the Poplars series paintings, Monet paid their owner to ensure that the trees remained standing until he finished his work.
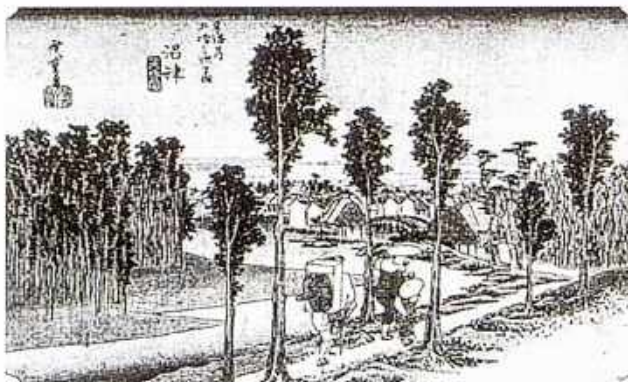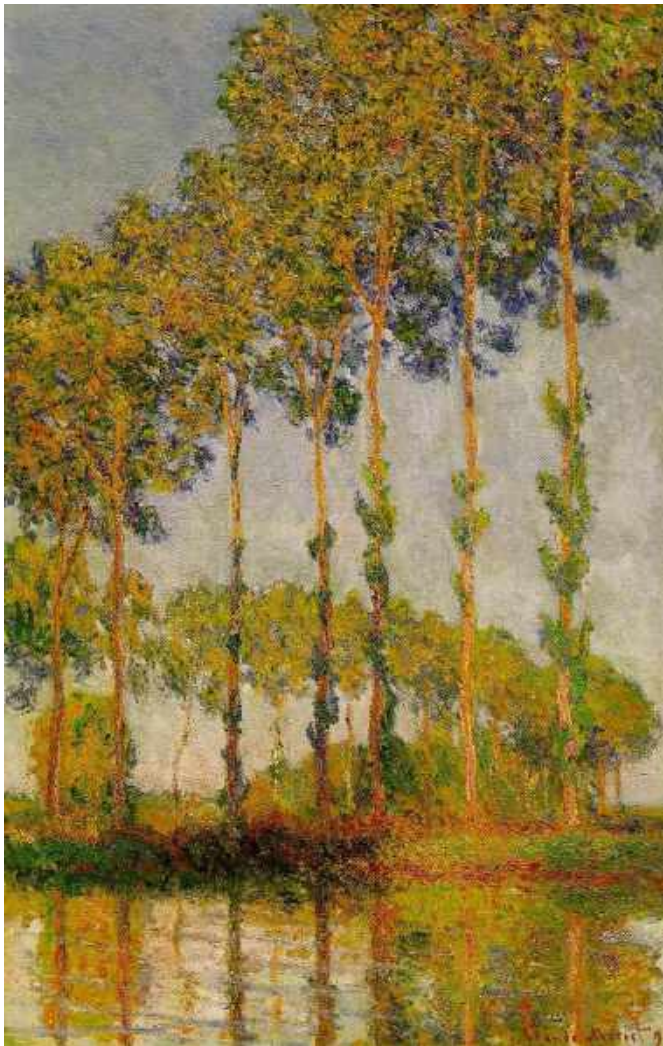
Figure 26. Japanese prints had a clear influence in Monet's art. For instance through their composition.

their second child. In this regard, the event that deeply struck him during his stay at Vétheuil was her death at the end of the summer of 1879. (Tucker 1995, 101–3)

Both personally and professionally, Monet was clearly going through a difficult time to say the least. In the period following Camille's death he mostly painted indoors, finishing pieces. That same year, after over a decade of commitment to the impressionist movement, Monet did something unexpected, he submitted paintings to exhibit at the Salon. As inconsistent as it may sound[2], it was a decision potentially based on his current financial distress and efforts to merchandise his pieces, but also on Renoir's example. (Wildenstein 1999, 148–60) Here is to be noticed that the years that followed that first impressionist exhibition were not particularly lucrative for Monet, and that, what once represented boldness against the conventional and threats to the Academy, "were now tolerated (though not widely accepted) notions. Impressionism had not completely lost its capacity to irritate conservative critics, but its edge had been blunted by time, exposure, and historical circumstances" (Tucker 1990, 18).

This marked a shifting in Monet's career without completely detaching himself from the movement. Unsurprisingly, Monet's return to the Salon grew him apart from core impressionists -and close friends- like Degas and Pissarro, but strengthened his friendship with Renoir. Yet, competition towards his colleagues played an important role for Monet's new approach. Especially competition towards emergent figures deriving from the last impressionist

2   Opposition to this system was the primary reason that brought the Impressionists together and their independent exhibitions had made at the time, a great name of Monet as one of the lead figures.

exhibitions, but with novel methods[3] such as Georges Seurat. Other motivations are related with the attempt of decentralizing Impressionism out of Paris or Parisian-related subjects, and making it more sensitive to the country as a whole. At last, the varied range of subjects he focused from there on led him to travel and paint new sites, and to demonstrate his artistic mastery and the versatility of Impressionism as style (Tucker 1990, 17–21). These motivations became guidelines during the 80s for Monet and framed the background to his series paintings.

Although every series Monet conceived has implications on its own and early criticism saw it as a decline on his work, there is sufficient evidence to state that as a novel approach to Impressionism, the series -in general- stay true to the core principles of the movement. They render the 'impression'. Not only by visually depicting the particularities of a given moment, but most importantly, by comparing the lighting qualities of many of these moments. In a way, the early assumption of Impressionism aiming to render the 'impression' evolved to the notion of *rendering multiple impressions* and presenting them as a whole, in which subject and viewpoint constitute the common ground and each particular painting emphasizes the 'impression'.

Monet's series also constitute a paradox. They departed from the spontaneity of the earlier impressionist work, while emphasizing instantaneity through the comparison of changing atmospheric conditions. Starting with his series of the Grainstacks (1890-1891) followed by the poplars (1891), he began to extract variation upon variation of the same motif under different

> ""
>
> Impressionism had not completely lost its capacity to irritate conservative critics, but its edge had been blunted by time, exposure, and historical circumstances
>
> ""
>
> (Tucker 1990, 18)

light effects. However, one must note that "Monet's series were not magically born of his first encounters with the grainstacks; they were the result of many years of experience. In the grainstacks and, above all, in the poplars [Figure 25], they [the series] reached their apogee" (Wildenstein 1999, 248).

Although the artist always began painting in front of his subject, often working on several canvases simultaneously to capture the 'impression', he would then spend long hours reworking them in his studio, sometimes over the course of years. This is precisely what builds up the paradox. If the aim was to depict the instantaneity, the momentary nature of an impression, why bothering deploying such further development on the canvases? For Monet, the answer to that question came with his next series, the one that is being given special interest in this academic work: Rouen Cathedral series.

---

3   In this case Divisionism, being the separation of color through individual strokes of pigments. Divisionism is often mistakenly called Pointillism, which is the application of precise dots of paint. Both techniques were later recognized within the avant-garde movement of Neo-Impressionism. (Amory 2004)

Notre-Dame de Rouen, Monet's Cathedral

Monet's series are paintings that represent the paradox of the momentary being built up over time. When the painter worked almost obsessively on *his Cathedrals*, it becomes clear that he had already come to this assumption. The painter was in Rouen over two extended stays in the consecutive winters of 1892-93, and later, on return visits in 1894, to elaborate more than thirty studies of the west façade[1] of Notre Dame du Rouen. These were conceived and -twenty of them- later exhibited as a series, displaying a vast range of tonalities, that visually convey the effect of the shifting light shaping the gothic building as the sun moves throughout the day. These paintings, even more than his other series, portray the progression of time and the subtle changes in light as the hours, even minutes, pass.

Monet was neither religious nor local in Rouen, but his choice of subject was not entirely oblivious to him. He had already depicted it from the river twenty years earlier. The Cathedral was the most famous building in upper Normandy, and as stated in the previous section, there were efforts on Monet's part to decentralize Impressionism. Also, he was there to visit his brother Léon and his friend Pissarro (Seitz 1960, 30).

Shifting canvases as the day progressed, the painter began his work at the locations he rented near the Cathedral[2]. But later, in his studio in Giverny, Monet would finish the paintings, carefully adjusting them both independently and as a whole[3].

In May 1895, Monet exhibited twenty of his cathedral paintings [Figure 28] at the Galerie Durand-Ruel in Paris, receiving mixed reviews. Rather neutral from fellow painters like Boudin (his teacher), who found them strange and commented on a *recherché*[4] aspect about them, but also very positive ones. Pissarro for instance shared his excitement about Monet's 'extraordinary mastery' at the Cathedrals and Cézanne later agreed, pointing out how accurate he managed to achieve such subtle and elusive effects. On the side of the press, it was mostly favorable. In particular,

---

1 Thirty canvases of the series still exist today. Twenty-six of them show the west façade from the south west.

2 They were three different locations: an apartment at 31, place de la Cathédrale (J. Louvet), another at 81, rue de Grand-Pont (E. Mauquit) and the second floor of a female store at 23, Place de la Cathédrale (M. Lévy). For this reason, the vantage point appears slightly shifted.
As for the other four canvases: two of them are rather front views of same façade and the other two are depictions of the Cour d'Albane (on the north side of the Cathedral, behind the Saint-Romain tower). (Wildenstein 1999, 283–84, 291)

3 Therefore, most of them are signed and dated 1894.

4 Rare, exotic; far-fetched, obscure. ("Recherché, Adj." 2009)
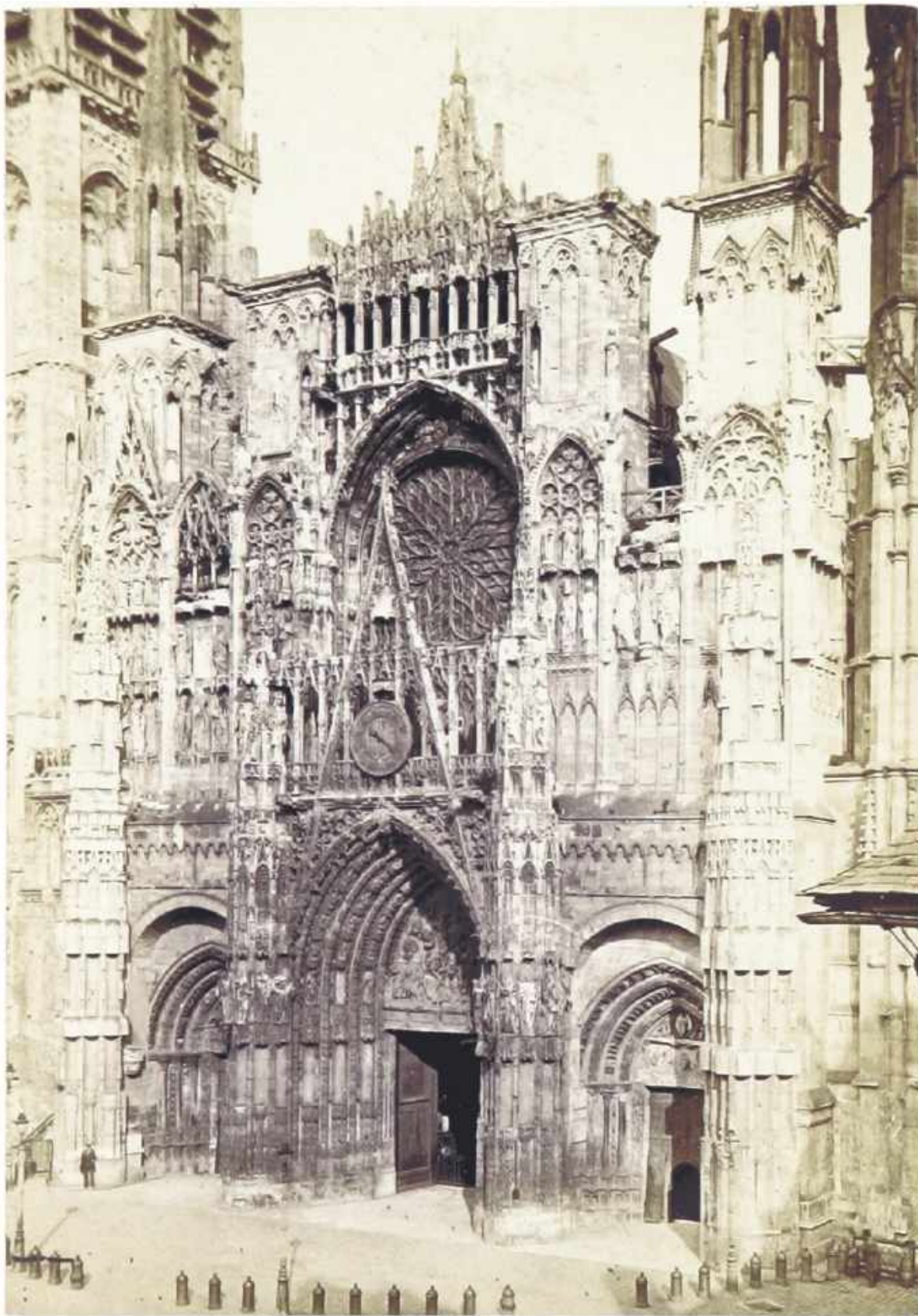
Figure 27. Above. Rouen Cathedral, West Front. 1865.

Figure 28. Next two pages. Eighteen of the thirty canvases that were conceived as a series.

the publication of an article written by Georges Clemenceau[5] entitled "Révolution de Cathédrales" (Cathedral Revolution) caught attention, specially Monet's. Clemenceau's praise of the series conveyed a mystical vision from a non-clerical point of view and positioned the Cathedrals rather as a nationalistic subject. (Wildenstein 1999, 308–9)

---

[5]   Clemenceau was a renowned journalist, who later became a dominant figure in the French Third Republic and Prime Minister of France during the Allied victory in World War I. (Monnerville 2002)
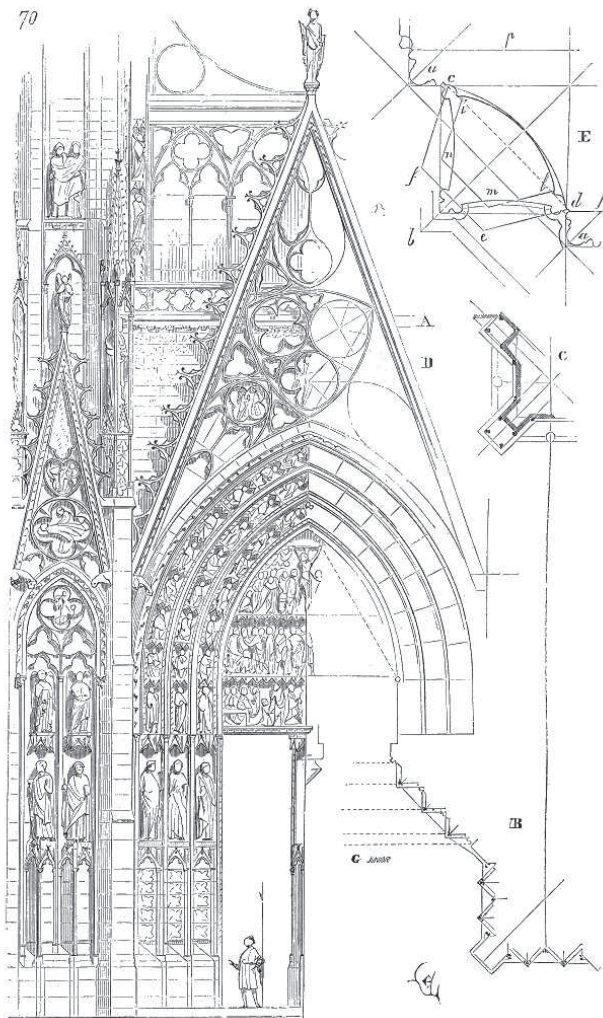
Figure 29. Viollet leDuc's study of the west front portal shows in detailed the intricated geometry of the buttresses.

A matter of temporality

However, what stands out in this series is precisely the choice of the subject. This non-natural, imposing, and above all, profoundly immutable architectural structure. According to author Ronald R. Bernier, when referring to how the Cathedrals are addressed by the critics, there are two distinctive approaches, and both rely in the issue of temporality. On one side, the matter of *perception*, in which the layered surfaces of individual canvases and optical density of impasto convey the complexity of our "momentary" perception [Figure 31]. On the other, the matter of *memory,* expressed in the historical character of the motif itself.

Again, this duality hinges upon the paradox of the momentary constructed in time. But it also influences our understanding of the subject matter through a depiction that emphasizes the own perception. In the words of Bernier, here "we can *recognize* the subject in the painting and *see it differently*. This is what Monet's critics do and this is what they resent doing. They (we) are made to conceive of the "unfinished manner of painting" as calling upon the complexity of our visual experience and doing so in a way that is not predetermined by the "real" presence of the subject outside of its projected or imagined world in representation" (Bernier 2007, 28).

A matter of light

Monet's interpretation strengthens the meaning of the cathedral as powerful symbol in the arts. The nostalgic revivals of the Gothic as cultural phenomenon in fin-de-siècle France is the context to this interpretation. The romantic, nationalistic, political visions of the cathedral as subject were interpreted across visual arts, literature, and music, by figures such as Auguste Rodin, Auguste Renoir, Emile Zola, Joris-Karl Huysmann, and Claude Debussy. In this time, the cathedral comes to represent the exteriorization of the internal experience, a space for self-reflection as a subject of artistic expression. (Moore et al. 1997)

Figure 30. In "La Façade de la cathédrale de Rouen au soleil" this same geometry is barely recognizable but it equally conveys its plasticity.

Nevertheless, the romantic nostalgia and symbolism featured in these interpretations do not fall too far from the original meanings of the cathedral at the time of its appearance in the Middle Ages. The Gothic cathedral originated in the secular context of twelfth-century France, and was deeply influenced by the religious experience, the metaphysical speculation and even the physical realities (Simson and Simson 1988). Following the Romanesque period, the vision that technically challenged generations of artistry craftsmen, architects, and engineers was related to the symbolic role of *light* as representation of the celestial. The technological challenge of penetrating the materiality of load-bearing walls had a very clear intention: *letting this light strike through.*

A matter of transcendence

Recalling the question raised in the previous section, of why Monet would go through such a time-consuming process in order to depict the momentary, there are hints throughout his correspondence with his merchant Paul Durand-Ruel and his friend Gustave Geffroy during the time of the series, that help us understand his quandary. His reactions -documented in these letters- are evidence of the realizations regarding the purpose of painting the cathedrals. Between mood swings and bursts of genius, Monet shared his struggles:

"

I work hard but what I have undertaken here is of enormous difficulty, but at the same time of great interest. Unfortunately, the weather is turning bad, which is going to trouble me...

"

Rouen, March 9, 1892. To Durand-Ruel.
(Venturi 1968, 1:343)

———————

"

I'm working hard, but I can't think of doing anything but the cathedral. It's a huge job.

"

Rouen, March 30, 1893. To Durand-Ruel.
(Venturi 1968, 1:349)

"

My stay here is advancing, it doesn't mean I'm any closer to finishing my cathedrals.
Alas! I can only repeat this: the more I go, the more difficult it is for me to render what I feel; and I say to myself that he who claims to have finished a painting is a terribly arrogant person. To finish means to be complete, to be perfect, and I work hard without advancing, searching, groping, without achieving much, but to the point of becoming tired of it.

"

Rouen, March 28, 1893. To Geffroy.
(Geffroy 1922, 194)

———————

"

[...] I'm discouraged enough to be on the verge of giving up the cathedrals, which I can't get out of as I please. By the end of the week I will write to you and say yes or no, but I think it will be no. Time goes by and I'm not getting anywhere.

"

February 20, 1894. To Durand-Ruel
(Venturi 1968, 1:349)

Figure 31. Opposite. "Le portail, effet du matin" is a proper example of this loaded impasto.

The exhibition was indeed postponed. And, as we know, twenty of the Cathedrals were exhibited together, along with other pieces. Even though at their moment, only a few reckoned their uniqueness, it was only a matter of time for them to be considered a decisive milestone in Monet's lifework and in the evolution of Impressionism. The Cathedrals set a precedent to what came after with modern art, especially in the field of abstraction.

This achievement is summarized by William C. Seitz, when he states that „a peak in *Monet's materialization of the ephemeral* is arrived at the Cathedrals. Even in his early canvases he painted the visual curtain rather than conceptual bulk. Later on, impressions were interpreted, controlled, and intensified. But gradually, as his eyes probed more deeply, as he analyzed more carefully both what he saw and his responses to it, *he painted sensations as well as appearances.* Finally, in these works, subject, sensation, and pictorial object have all but become identical, anticipating the "façades" painted by Picasso and Braque fifteen years later" (Seitz 1960, 31).

As *materialization of the ephemeral* and further hint to Monet's intentions when realizing the Cathedrals, the central matter upon which this academic work hinges is precisely the concept to be introduced in the following section.

"

Fourteen canvases today, none the same. If I remain in Rouen, it is because now I am beginning to understand my subject.

"

(Bernier, 2007, S. 73)

Figure 32. Detail of the gable and tympanum of the cathedral in "Le Portail".

L'enveloppe above all

―――――――

"

The motif is something secondary for
me; what I want to reproduce is what
there is between the motif and me.

"

Monet's Interview to the Norwegian Newspaper
"Dagbladet",
1895 (Wildenstein, 1979, 65)

That, standing between the painter and his motif was the enveloppe *[l'en-veloppe],* a term used by artists in the nineteenth century, to describe the unifying luminous atmosphere which surrounds objects.

The changes on Monet's practice when undertaking series painting and the arduous -almost obsessive- process behind that, finds its raison d'être in this concept. Critics have described it as the vibration of light around objects, as movement of ether[1], as the tangible unifying atmosphere[2], as a light-sphere in which the objects come to visibility[3], as a technical matrix[4]. Using that specific term though, the painter himself summarizes his aims with much more ease in this well-known letter when painting his first series:

―――――――

1   Hugues Le Roux for an article in Gil Blas (Wildenstein, 1999, 249)

2   John House, in his analysis of Monet's work and the public exhibition (House, 1986, 220)

3   Richard Boothby, in his study of Monet's Series paintings to introduce psychoanalysis. (Booth-by, 2015, 19)

4   Charles A. Riley, in his compendium of modern theories of color in Philosophy, Painting and Architecture (Riley, 1995, 73)

Figure 33. L'enveloppe, as the vibration of light around objects, as a tangible, unifying atmosphere.

"

I draw a lot. I am stubbornly
pursuing a series of different
effects, but at this time the sun is
declining so fast that
I cannot keep up with it.
I become so slow to work that
I despair, but the more I go, the
more I see that it takes a lot of
work to achieve what I'm looking
for: "instantaneity", especially the
"enveloppe", the same light spread
everywhere.
And I am more than ever dissatis-
fied with things that come easily,
at the first attempt.

Finally, I am excited by the need
to render what I feel, and wish
to live still not too impatient,
because it seems to me that
I will make progress.

"

October 7th 1890, Claude Monet
to Gustave Geffroy. (Geffroy, 1922, 189)

Above all, what he pursues is to render the *enveloppe*. Yet, there are two other aims in his statement. The matter of temporality addressed in the idea of *instantaneity*, and the matter of transcendence, handled in his rejection of the "*easy things*", referred to the quick sketch linked to early Impressionism. To introduce these intentions and the concept of the *enveloppe*, author John House emphasizes on Monet's art when shifting his practice to the series. At this point, it had a central element upon which many critical discussions grew up: the painting of light.

The notion of the *enveloppe* is closely related to atmospheric light. Even though the ideas surrounding this concept were long known in Monet's art, the extended use of the term among his critics began in the late 1880's. In 1888, Monet refers to his Antibes paintings as "all *enveloped* with this enchanting air" and this is considered the first record of his own use of the terminology to describe the qualities of light through color.

Again, according to the letter, the concepts of the *enveloppe, instantaneity* and the *rejection of the things that come easily* are closely related and were indeed, his intentions. Monet's conceptual framework, however, seems to derive from the resolution of the conflict between them, between aiming both, to capture fleeting and ephemeral effects, and to develop his painting in a detailed level. The notion of instantaneity itself reflects the greatest paradox of his practice, "the point at which painting is forced to acknowledge its categorical disjunction from the perceived world: *the work of art, produced over a period of time and viewed in time, transcends the instant which ostensibly it claims to capture*. [...] it was at this point of his career that he fully acknowledged this paradox, in coupling his search for instantaneity with his rejection of the quick sketch" (House, 1986, 221).

Now, we can agree that the matter of temporality within Monet's Cathedrals, discussed in the previous section, based on the view of Ronald Bernier finds its bottom line in this paradox. In other words, the idea of instantaneity in the Cathedrals is indeed the *perception of the 'momentary' constructed in time*.

A matter of temporality, light, transcendence…
In his interview to Monet in 1889, French journalist Hugues Le Roux gave an anticipation to what the painter was pursuing at the time in the form of a major realization. In the words of Le Roux, Impressionism according to Monet "is first and foremost the painting of the '*enveloppe*', this movement of ether, this vibration of light that palpitates around objects" (Le Roux as cited in Wildenstein, 1999, 249).

One year later, by the time Monet expressed his intentions towards painting in the letter to Geffroy, he was already immersed in this discourse and deliberately experimenting with it in his first formal series, the Grainstacks. According to author Richard Boothby, "Monet's Grainstacks remind us that the objects of vision are always *situated in a total environment of light*. However, the *light-sphere* in which the objects come to visibility is not in itself visible. Monet's project in the Grainstacks is therefore a paradoxical one, intimately bound up with the paradoxes of vision itself. *Monet attempts to render the invisible conditions of visibility*. It is this sharpened interest on the medium of illumination itself that distinguishes the Series paintings from Monet's earlier work and prompts us to amend Jules Castagnary's definition of the impressionist painter as rendering 'not the landscape but the sensation produced by the landscape'" (Boothby, 2015, 19).

Precisely because of the impossibility of representing these invisible features of the *enveloppe* through the visible medium of painting, Monet retrieves the matter of temporality by depicting this ephemeral feature as shifting light. The shift, however, occurs through comparison. In this manner, Monet's depiction of the *enveloppe* serves from the notion of the 'series' and evolves throughout them, from the Grainstacks to the Water Lilies.

By the time he develops the Cathedrals, his realizations on the depiction of the *enveloppe* are precisely his understanding of the subject. Some critics, such as Joachim Pissarro have even implied "that Monet did not, in fact, paint the Cathedral. He painted this invisible mass of air between himself and the Cathedral, composed of innumerable waves of sunlight,

intertwined with mist and cold, that make the cathedral visible." (Pissarro, 1990). It can be stated that his subject was indeed, the *enveloppe*, and its depiction required the development of serial painting to deliver the idea of *instantaneity* through the comparison of 'instants'.

As Boothby unfolds it, "…with the Cathedrals we realize again how the enveloppe is less an image than a kind of sublime idea. By its very nature it cannot be conveyed in a single canvas but dawns on the viewer slowly, through comparison of a succession… the environing *enveloppe* becomes perceptible only by means of the contrasting of different times" (Boothby, 2015, 20).

…and color.
According to author Charles A. Riley, true colorists in art are the descendants of the Impressionists. With the attempt to reproduce natural chromatic phenomena, this mimetic style involves a process named optical mixing, which is a phenomenon that occurs when a color is perceived in an image as a result of two or more colors being side by side. The color perceived is not actually on the surface, but its effect is more intense than what would result from the physical mix of the paint. This *independence of color*, and the *active role of the eye* (in the sense of visual perception) are key signs of the anticipated notion of color introduced by the Impressionists (Riley, 1995, 71–72).

In this impressionist understanding of color there is another factor involved, related to the atmospheric effects that Monet was eager to render. This factor is *motion*. Riley states that kinesis, physical movement occurs through the process of optical mixing. The busy brushwork allows it to happen in a subtle but palpable way, as a sort of rhythm or pulse that gives a sense of movement to the whole. "Each color, of course, has a vibratory effect, and from these various degrees of movement one can understand how kinesis became an imperative handed down as a part of the Impressionist legacy" (Riley, 1995, 72).

The notion of the *enveloppe* is a part of this legacy. And even though it has been mostly analyzed through the art of Monet, the term

was earlier used by other artists, like Jean-Baptiste-Camille Corot and Eugene Boudin, to describe the unity in the painting of such atmospheric effects. Particularly Boudin, who influenced Monet at the very beginning of his career, gave hints to this concept as early as three decades before the series:

"Sometimes, during my melancholy walks, I gaze on this light that inundates the earth, that quivers on the water, that plays on clothing, and I grow faint to realize how much genius is needed to master so many difficulties, how limited is the power of man's mind to put all these things together in his brain. Then I feel that poetry is there… Sometimes I catch a glimpse of what must be expressed. Twenty times I have begun again in order to approach the delicacy, *the charm of the light that plays everywhere*. How fresh it is! It is soft, faded, rose-tinted. The objects are drowned. There is nothing but tones everywhere. The sea was superb; the sky was soft, velvety. It then changed to yellow; it became warm; then the setting sun gave beautiful violet nuances to everything; the earth, the breakwaters also took on this hue. Nature is so beautiful, so splendid; it is always in this that my secret torment lies when misery releases its grip a bit. It is a great blessing for us to see, to admire unceasingly, all these splendors of sky and earth, if it were only to admire them; but do not continually mix it with the torment of reproducing them…" Eugene Boudin. Extracts from his notebook, c. 1854-1859" (Seitz, 1960).

The materialization of the ephemeral as a plastic, dimensional depiction in Monet's Cathedrals leads to think of the possibilities of further understanding of the *enveloppe* with our current media. In the next and last section of this chapter, ideas regarding this concept in relationship with immersive media will be introduced.

A matter of medium

———————

Water, paper, light, paint, internet, money. What do all these subjects have in common? Each one of them is considered —under different connotations— a medium. The term medium covers, as media itself, a broad spectrum, and it is closely related to the content it conveys. Among many of its connotations, a medium can be "an intermediate agency, instrument, or channel; a means of communication or expression", as well as "any raw material or mode of expression used in an artistic or creative activity" and also "any physical material used for recording or reproducing data, images, or sound" ("Medium, n. and Adj.," 2020).

To understand immersive media in the creative field, it is imperative to recall the meaning of media at its essence. In Understanding Media: the extensions of man, Marshall McLuhan (1964) repeatedly refers to medium as *any extension of ourselves*. This view suggests that media should be understood as extensions of the human body when trying to reproduce the vast sensorium of human experience. According to his theories, the *medium is the message*, shaping and controlling the scale and form of human association and action. He argues how typical it is, that the "content" of any medium blinds us to the character of the medium itself (McLuhan, 1994, p. 9).

In other words, the power inherent to the medium is sometimes detracted from the nature of the content.

Medium vs. message
McLuhan contended that throughout history, *that* what has been communicated is sometimes less important than the particular medium through which people communicate. He illustrates this thought taking the example of electric light as a medium without a message. Since there are activities that exist only through electric light, these could be somehow understood as its "content". Nevertheless, "the electric light escapes attention as a communication medium just because it has no 'content'. And...", according to his theory, "this makes it an invaluable instance of how people fail to study media at all" (McLuhan, 1994, p. 9).

Although the theories McLuhan developed were contextualized half a century ago; these are not at all devoid of importance and stay current as if he had experienced the digital age. This merely underlines the importance of the medium on the perception of the message and argues the possibility of *these two concepts*

Figure 34. Electric light represents a medium without a message.
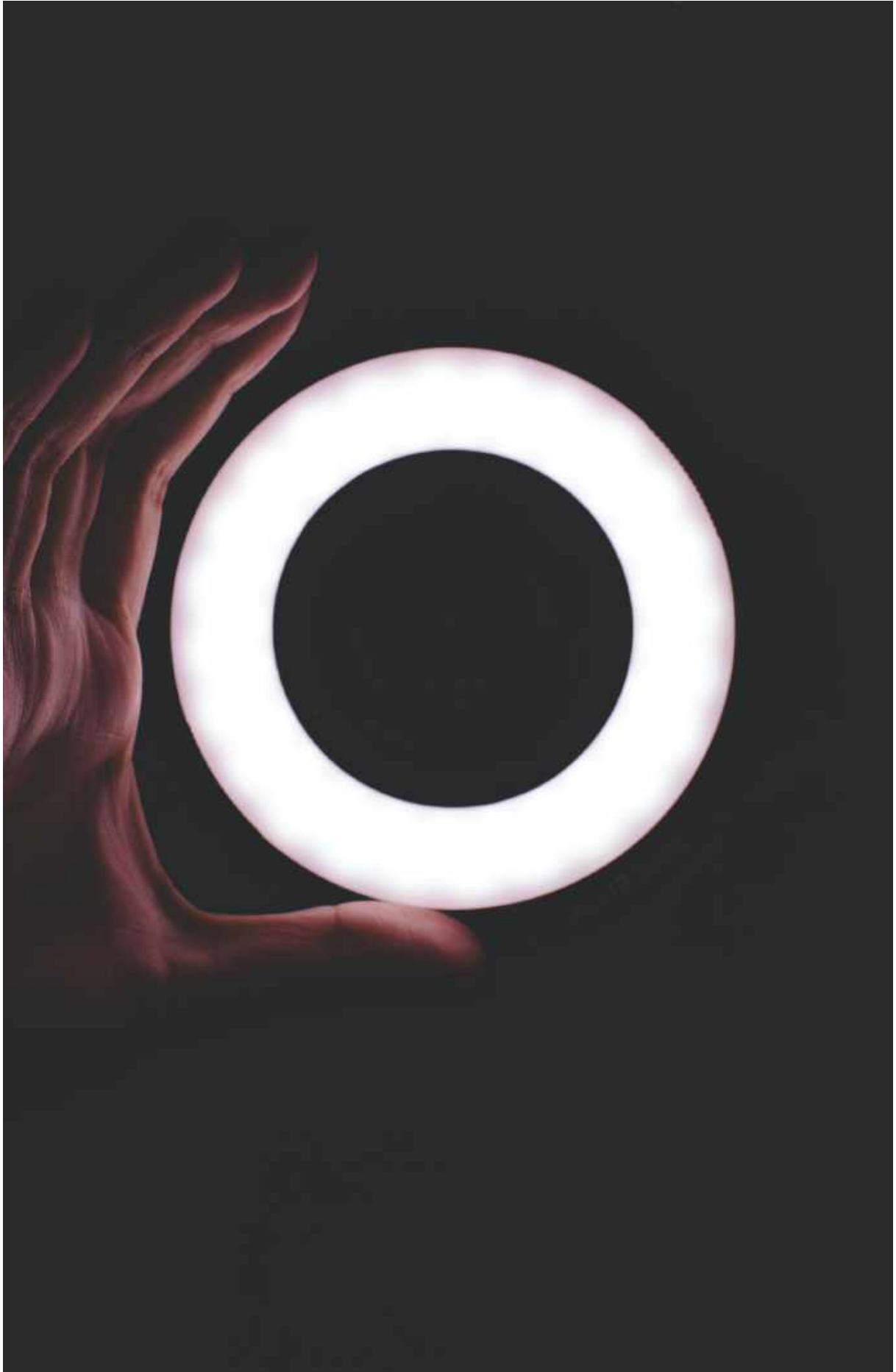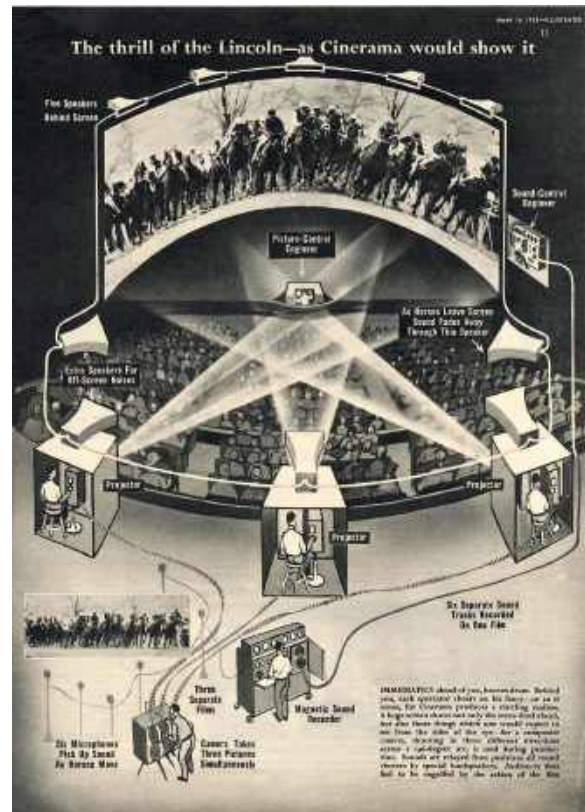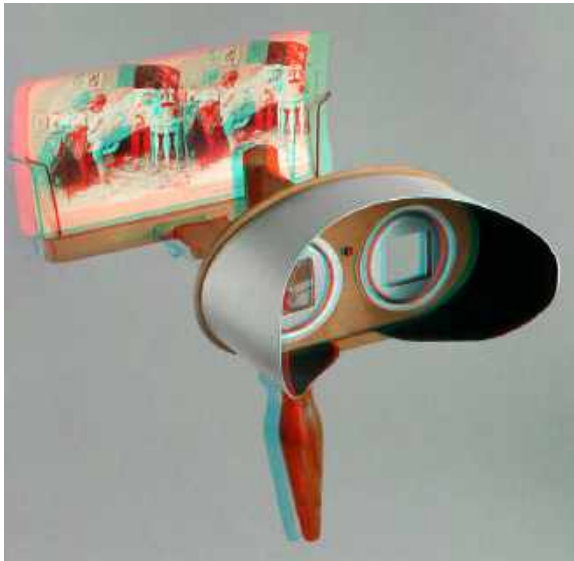
Figure 35. Upper left. Holmes card viewer or Stereoscope, 1915.

Figure 37. Lower left. Morton Heilig's Sensorama, 1956.

Figure 36. Upper right. Fred Waller's Cinerama, 1952.

Figure 38. Lower right. Ivan Sutherland's Head Mounted Display, 1968.

Figure 39. Robert Barker's first panorama was the Panorama of Edinburgh, 1792.

being the same artifact. This strong of a statement has been discussed among critics, but one thing is factual: a medium is indivisible from the information or content it holds. This particular fact reminds the notion of the *enveloppe* as a mass which carries along light. McLuhan's understanding of *media* constitutes a groundwork for *new media* studies. The broadness of this term and its 'newness', however, make it blurry, as the boundaries between different media themselves. Its extensive use makes it relatable to our every day, but most of the time under a very unprecise understanding of it. Although a universal definition would be too reductive, there are key characteristics to 'new media'. According to Martin Lister et al. (2009):

"The term 'new media' emerged to capture a sense that rapidly from the late 1980s on, the world of media and communications began to look quite different and this difference was not restricted to any one sector or element of that world, although the actual timing of change may have been different from medium to medium. This was the case from printing, photography, through television, to telecommunications. Of course, such media had continually been in a state of technological, institutional, and cultural change or development; they never stood still [...] The unifying term 'new media' actually refers to a wide range of changes in media production, distribution, and use. These are changes that are technological, textual, conventional, and cultural." The authors recognize that at least since the mid-1980s "a number of concepts have come to the fore which offer to define the key characteristics of the field of new media
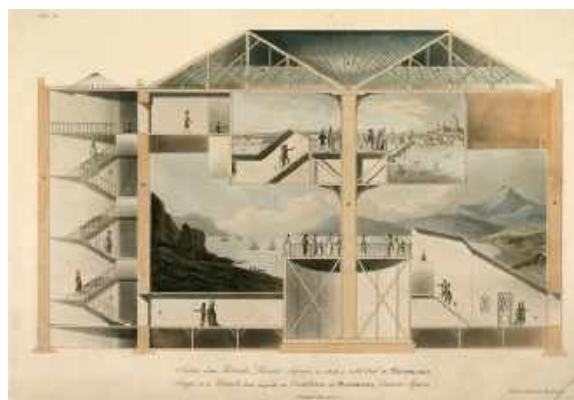
Figure 40. Barker's vision was to capture the magnificence of a scene from every angle so as to immerse the spectator completely. For which realized a cilindrical panorama inside of a rotunda he purchased with his son.

as a whole [...] These are: digital, interactive, hypertextual, virtual, networked, and simulated." (Lister et al., 2009, p. 10,13).

Under the vast scope of new media, however, there is a category which comprehends two specific technologies concerning this academic work: *immersive media*. Both these technologies, *projection mapping,* and *virtual reality* produce effects of immersion by addressing perception in different ways.

Immersive media
To begin, what makes media immersive? The answer hinges upon the relationship of the biological body to the medium, and this notion is not new. Author Julie Woletz discusses this by underlining early examples of immersion and immersive techniques in illusionary spaces. From the circular frescoes on the walls of Villa dei Misteri in Pompeii (60 BC), passing through Robert Barker's invention of the Panorama (1787), Holmes card viewer or Stereoscope (1915), Fred Waller's Cinerama (1952), Morton Heilig's Sensorama (1956), until

Ivan Sutherland's first Head Mounted Display (HMD) (1968), all of the pre-digital examples of immersive media -and Sutherland's pioneer device already in the digital age- constitute milestones to deceive human perception, creating optical illusions of artificial environments in three dimensions.

To achieve such spatial depth, these devices make use of certain characteristics of visual perception. In physical spaces, for instance, the distance of objects is given through the stretching and relaxing of the muscles of the eye lens. Immersive techniques make use of these depth cues to create the impression of spatial depth. In two-dimensional images, an illusion of spatial depth can be perceived by just one eye using monocular depth cues such as occlusion, relative size, texture gradient, and linear and aerial perspective. Another technique for creating illusionary spaces is motion. The kinetic depth effect renders a three-dimensional optical illusion of motion, for instance, in images that go from flat to three-dimensional by simply rotating. The most advanced technique to provide spatial depth is by binocular disparity and stereopsis[1] (Woletz, 2018).

Immersive techniques have indeed been present since the antiquity, applied among inventions whose mechanisms borrow principles from one another. These are mainly oriented to trick our perception into experience alternative realities or 'illusionary spaces', as Woletz (2018) refers to them. Therefore, despite the extensive use of the term *immersive* nowadays, this type of media is far from being a novelty. The interest among this topic though has been notably higher in the last years, presumably due to the transition of related technologies into the consumer electronics market.

In this regard, Woletz states that "some immersive techniques can be connected to earlier forms of artistic media and cultural practices and thereby situated within general acts of perception. Other forms of immersion, especially those based on computing systems, derive from current innovations and technologies, and are therefore just being formed and stabilized as new cultural programs." (Woletz, 2018, 97).

Figure 41. The Villa dei Misteri in Pompeii (ca. 79 BC) is considered as an example in the Antiquity to achieve effects of immersion. If features depictions of illusory architecture, such as columns, illusory masonry and the like, as well as views of illusionist landscapes.

1   Both terms refer to stereoscopic vision, through which our brain registers a sense of three-dimensionality by making coordinated use of the information retrieved from each eye. Binocular disparity refers to the small differences between the two images registered by each eye, which are similar but have slightly different vantage points (Lappin, 2014). Stereopsis is the ability to perceive depth and relief by stereoscopic vision ("Stereopsis, n.," 1989).
This is the technique applied in wearable devices like Sutherland's HMD and its current successors, such as Palmer Luckey's Oculus Rift, introduced in the consumer's electronics market in 2016 ("Oculus Rift," 2020).

Figure 42. One technique to create illusionary spaces is Anamorphosis, which is a distorted representation appearing normal when viewed from a particular point. Here, Yadegar Asisi's anamorphic painting of the St. Michaels Church on the Berlin Wall, 1987.

Summarizing, a medium can be considered immersive when it achieves to *deceive our perception into experiencing an illusory space*, and this is accomplished through mainly visual immersive techniques that find their roots in early art forms. These techniques indicate that the phenomenon of immersion is closely related to the ability to perceive three-dimensional characteristics of space. Bearing this in mind, it is time to understand how *projection mapping* and *virtual reality* produce effects of immersion.

Different worlds

Immersive strategies contemplate two different approaches. On one side, (1) the ones that recreate illusory spaces within given *physical spaces*, as in the case of circular frescoes and panoramas, which surround the observer(s) if not always in 360°, at least partially. In any case, the image is large enough to cover the viewer's field of vision. On the other side, (2) there are the techniques and illusory devices that function with the so-called

Figure 43. Another technique, which also uses visual depth to create an optical illusion is the Ames Room. Through a peephole the room appears to be a rectangular cuboid, but in reality it is a six-sided convex polyhedron.

'peep-throughs', like the Sensorama or the HMDs. In this case, the field of vision is restricted through a *confined space* and it represents an *individual experience*. In both ways of manipulating the field of vision of the spectators, the boundary of reality disappears, at least visually (Woletz, 2018, p. 103). This is precisely what creates the illusion of being immersed in an illusory space.

The approach to producing effects of immersion by using a given *physical space* is the one employed in *projection mapping*. Due to the many alternative names this medium has had over its relatively short history[2], it is important to clarify that by *projection mapping*, it is here referred to the application of light whose geometry corresponds to the complex surface on which it is projected (Schmitt et al., 2020). In other words, the projection of graphics onto a corresponding three-dimensional surface. In this case, like in panoramas, the experience can be *collective*, and the effect of immersion is given by overlapping of two different but correlated environments; a digital 'illusory' one mapped onto the surface of a physical 'real' other [Figure 46].

---

2   Since the 1990s the practice of projection mapping has developed, particularly in the artistic field. During this development, other terms to it have been: *spatial augmented reality, video mapping,* and *spatial correspondence* (Schmitt et al., 2020).

Figure 44. Projection mapping installation at the Klima Pavillion in the Genius Loci Weimar, 2018.

While in projection mapping any object can become a screen [Figure 44], in virtual reality the screen is encapsulated in a *confined space* that comes closest to the viewer. It is necessary to note that in comparison to projection mapping, the term *virtual reality* has been present for much longer, and any brief definition leaves out many of its implications as a concept, technology, and medium. However, when referring to *virtual reality* (*VR*) in this context, it is mainly understood as "an immersive, interactive system based upon computable information", in which "immersion comes from devices that isolate the senses sufficiently to make a person *feel transported to another place*" and "interaction comes from the computer's lightning ability to change the scene's point of view as fast as the human organism can alter its physical position and perspective" (Michael Heim as cited in Silcox, 2018).

In this way, VR systems induce the sense of immersion by restricting the field of vision according to the principle of 'peep-throughs', like the Sensorama. Here, the relationship of the body to the device that creates the illusion occurs differently, as Heim explains it in his definition. On HMDs like the Oculus Rift (2016) [Figure 45] the viewer 'carries' the screen since the content is displayed inside of the wearable device. In the case of CAVE Automatic Virtual Environments or

Figure 45. Above. Palmer Luckey presenting his prototype of the Oculus Rift, which has been credited to revive the VR industry, by placing an afordable HMD in the consumers electronics market.

Figure 46. Left. Projection mapping applied in an audiovisual presentation at Berlin Atonal, the annual festival for sonic and visual art, 2017.

Figure 47. Cruz-Neira's CAVE. Within the system, the user's head position is tracked so that what is displayed preserves proper perspective in adapting to movements and change of location of gaze.

Figure 48. Below. This type of facilities are mainly directed at research. In this example, a simulation is carried out with realtime collision detection with optical Tracking.
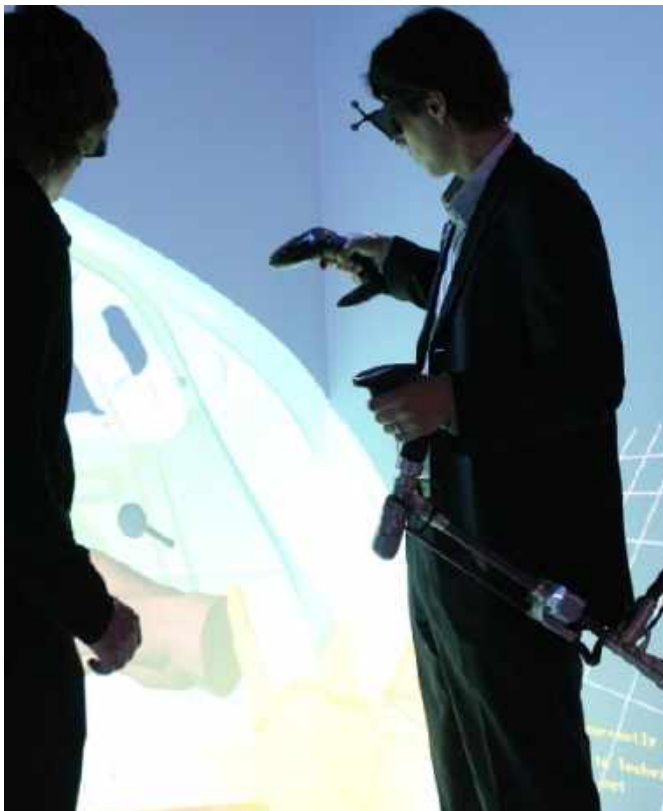
CAVE technologies[3], the viewer moves within a location-responsive 'surround screen' projection. In the latter, despite the possibility of admitting more than one user in the confined room-like space, the projection responds to a single-user vantage point. In either case, both HMD and CAVE VR systems are user-centered devices, in which being immersed in an -entirely- illusory space is a merely *individual experience* [Figure 48 and Figure 49].

Even though both these immersive media, projection mapping, and VR, achieve the task of deceiving perception sufficiently to give the feeling of an alternate reality, one of them exceeds at isolating the senses to a higher degree of immersion. In VR, the sense of embodiment[4] is experienced else how, puzzling our conceptions of space, and enabling a gateway to the illusory, virtual world.

3   The CAVE (1991) is an immersive system that has become the standard for rear projection-based virtual reality systems. According to its inventors, its name "is both a recursive acronym (CAVE Automatic Virtual Environment) and a reference to "The Simile of the Cave" found in Plato's Republic, in which the philosopher discusses inferring reality (ideal forms) from projections (shadows) on the cave wall. (Cruz-Neira et al., 1993)"

4   "Literally: of having and being conscious of having bodies. (Lister et al., 2009, 37)"

At the beginning of this century, Oliver Grau claimed that:

"

...never before has the world of images around us changed so fast [...], never before have we been exposed to so many different image worlds, and never before has the way in which images are produced changed so fundamentally. [...] We are experiencing the rise of the computer-generated, virtual spatial image to image per se, to images that appear capable of autonomous change and of formulating a life-like, all-embracing visual and sensory sphere. [...] The suggestive impression is one of immersing oneself in the image space, moving and interacting there in "real time", and intervening creatively...

"

(Grau, 2003, 1631)

Figure 49. Setup of the CAVE system for a project in the NeuroEngineering and Rehabilitation field.

Bridging art, science, and technology, new generations of artist-researchers and researcher-artists have explored and appropriated new immersive media with their own methods and strategies. The development of the technologies which support these media involves indeed, constant cross-disciplinary collaboration and intellectual confrontation. At a fast pace, more technologies become a medium by being widely accepted in a social sense, and subsequently, approachable. After all, "a medium is more than the technology it depends upon; it is also a practice. It is a kind of skilled work on raw materials (whether they be words, photographic materials or digitized analogue media) which uses conventions, structures, and sign systems to make sense, to convey ideas and construct experiences (Lister et al., 2009, 107)."

Because of the profound individual nature of this act, anyone can only speak from their perspective when experiencing something. This is to emphasize that the prototyping process documented in the next pages derives directly from the learnings of this research, and it aims to offer an approximation to Monet's *enveloppe* while experimenting with two immersive media.

"

Rather than approaching the medium as a means of escape into some disembodied techno-Utopian fantasy, I see it as a means of return, i.e., of facilitating a temporary release from our habitual perceptions and culturally-biased assumptions about being in the world, to enable us, however momentarily, to perceive ourselves and the world around us *freshly*.

"

2004, Char Davies when referring
to immersive virtual space
(Davies, 2004).

TRANSCENDING THE CANVAS

Conceptualization

Input

Data through photogrammetry:
3D out of 2D

Data through image processing:
the Cathedral Series

Output

Prototype 1. Projection mapping

Prototype 2. VR visualization

By understanding that the pursue of depicting the *enveloppe* was indeed a crucial motivation behind the practice of one of the most influential artists in history, the first approach to start conceptualizing around the notion of the *enveloppe* began by identifying the original intentions behind this construct of Impressionism. As summarized in the previous chapter: *temporality, light, transcendence*, and *color* constitute the main aspects to understand this concept, and are therefore, taken as the first assumptions to any representation of the *enveloppe*.

Bearing this in mind, it became imperative to look for novel approaches to these aspects in other visual art practices, especially within *immersive media*. On one hand, the perspectives of visual artists such as Carlos Cruz-Diez [Figure 50], Olafur Eliasson [Figure 51], James Turrell [Figure 52] and Char Davies [Figure 53] closely explore these factors and constitute relevant references to understand these notions, regardless of the differences between approaches, art currents and media employed. On the other hand, Yadegar Asisi's work [Figure 54] represents a reference in terms of immersive techniques in art, which combine both digital and analogical media in their conceptualization and realization. In this case, the possibility of beholding the creative process behind this artist's oversized immersive installations provided not only understanding to the phenomenon of the panorama as a powerful immersive medium, but a whole new perspective to the notion of *visual depictions*.

By drawing a subject, Asisi often claims, one comprehends it in a level that surpasses other cognitive processes, such as reading and writing. In a way, through its visual depiction one can grasp a subject not only aesthetically, but fundamentally. In this sense, the *enveloppe* understood as subject would constitute an ephemeral artifact, absent of matter. Therefore, the medium to depict it should be, likewise, *ephemeral*. At the beginning of this process, what immediately came to mind when thinking of 'ephemeral' was light, *light as medium*. By then, the reason for choosing projection mapping and virtual reality as media to depict the concept of the *enveloppe* became clear. Besides immersion, light plays an intrinsic role in both media, displayed by very different sources but constituting the essence of their visual representation.

In the graphic documentation that follows, the strategies employed to conceptualize the depiction of the *enveloppe* and manifest its ephemeral character found an aesthetical parallelism in two data visualization artifacts: point clouds[1] and particle systems[2]. The data processed to generate these visualizations was gathered and developed around Monet's pictorial series of the Cathedrals and the architecture of the Gothic building itself.

Welcoming the three-dimensionality that surpasses the limitations of the canvas, this prototyping process aims to offer an approximation to what through our current means may be depicted as *l'enveloppe.*

----

1   A *point cloud* is a data structure that represents a collection of multi-dimensional points and is commonly used to represent three-dimensional data. In a 3D point cloud, the points usually represent the X, Y, and Z geometric coordinates of an underlying sampled surface. (Bogdan Rusu & Cousins, 2011).

2   "A *particle system* is a technique in game physics, motion graphics, and computer graphics that uses many minute sprites, 3D models, or other graphic objects to simulate certain kinds of "fuzzy" phenomena, which are otherwise very hard to reproduce with conventional rendering techniques - usually highly chaotic systems, natural phenomena, or processes caused by chemical reactions" ("Particle System," 2020).
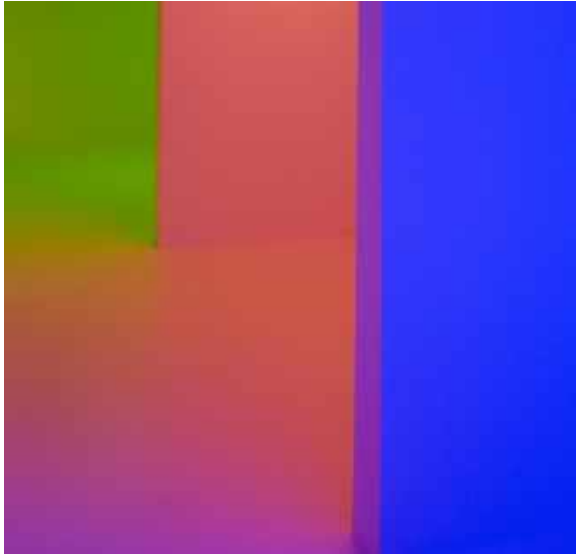
Figure 50. Upper left. Carlos Cruz Diez' "Chromosaturation", 1965, explores through color chambers iterations in visual perception.

Figure 51. Upper right. Olafur Eliasson's "Notion Motion", 2005, explores patterns of projected light resulting from users-interaction.

Figure 52. Lower left. James Turrell's "The Light Inside", 1999, deals with perception of time and space.

Figure 53. Lower right. Char Davies' "Ephémere", 1999, explores embodiment throught symbolic landscapes of light.
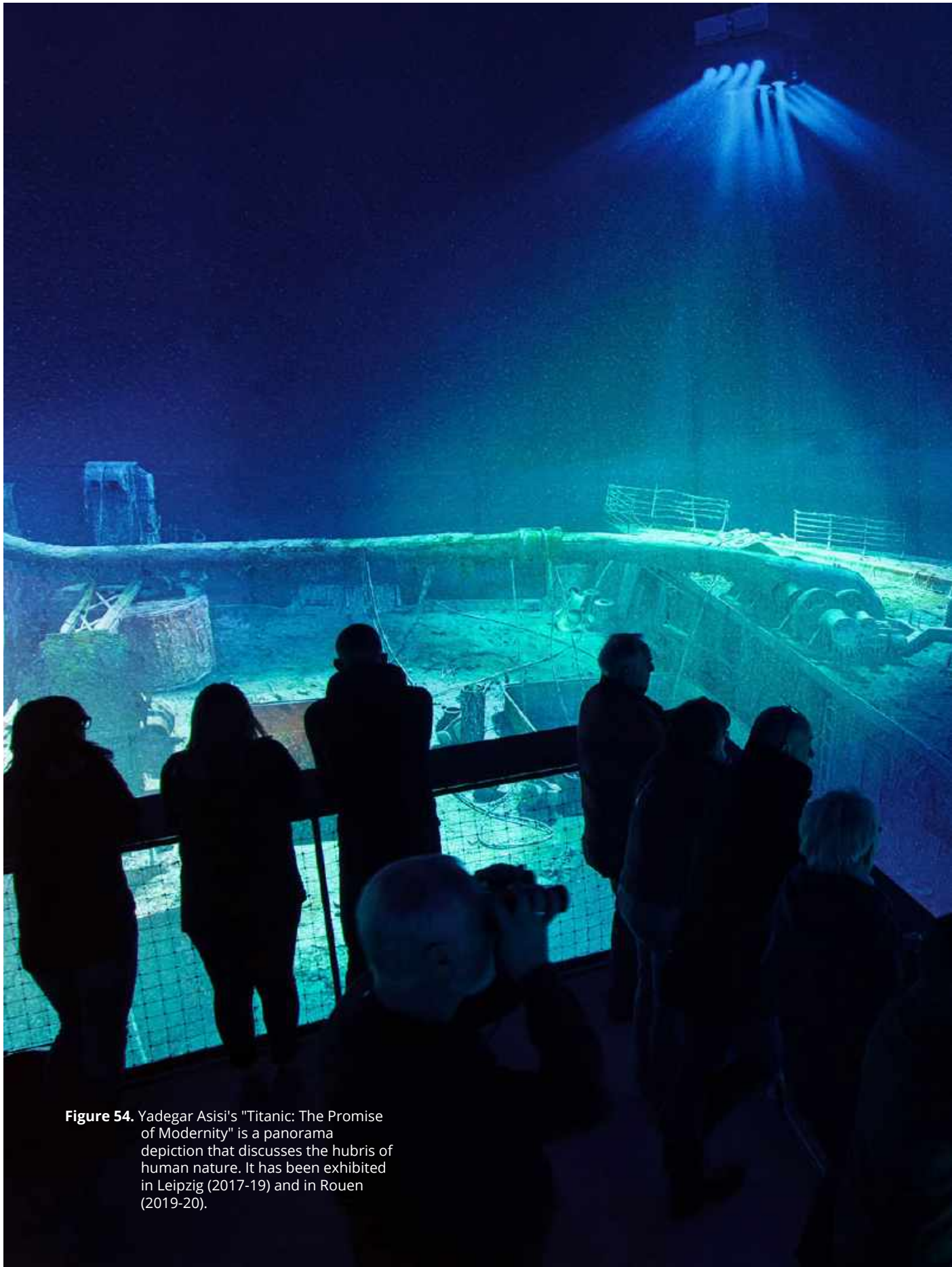
Figure 54. Yadegar Asisi's "Titanic: The Promise of Modernity" is a panorama depiction that discusses the hubris of human nature. It has been exhibited in Leipzig (2017-19) and in Rouen (2019-20).

Figure 55. Along the process, visual techniques such as mind maps and quick sketches were implemented in order to maintain a constant dialogue between theory and praxis.
The croquis above shows the urban context, in which Rouen's Cathedral is immersed. Its location, as well as the Panometer's is highlighted.
The first thoughts on concept were mainly focused on its understanding under the vision of Hume's philosophy.

Conceptualization

Figure 56. The first ideas hinged upon having the Cathedral as a recognizable motif at some point, but paying main attention to the surrounding space, instead of to the Gothic building.
A very early approach was aiming to confine the viewer's field of vision through a physical box-like model. Like in so-called 'peep-throughs', the idea consisted in having a single vantage point, from which the viewer would see a scaled version of the surroundings of the Cathedral while 'bathed' in an ephemeral effect.
At this point, the aesthetics of particles as a representation of the ephemeral light came into play and stayed for the next stage. However, the idea of a 'peep-through' model was dismissed.
The main question here was how to represent these particles?

INPUT

Data through
photogrammetry:
3D out of 2D

INPUT

Data through
image processing:
the Cathedral
Series
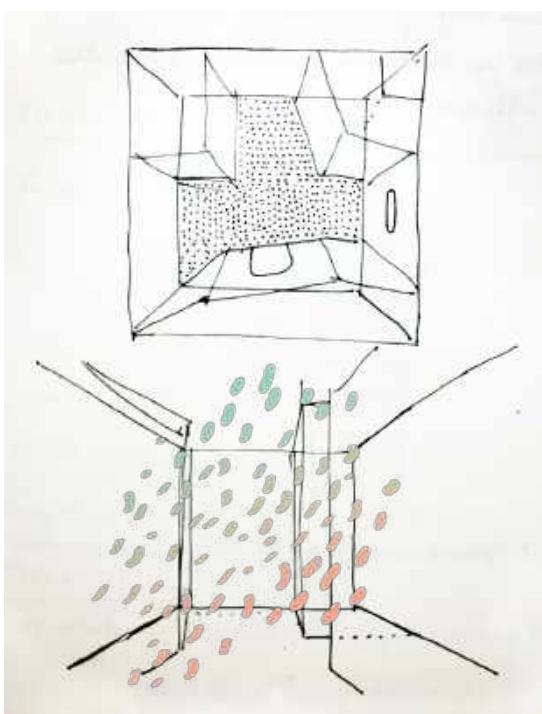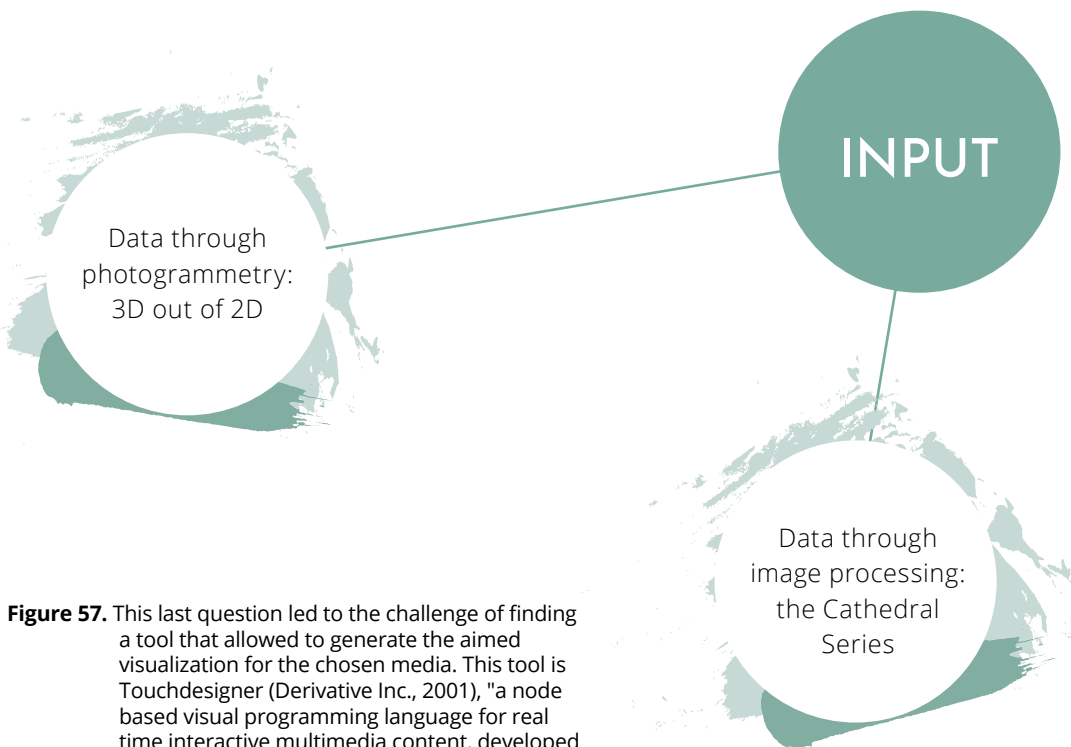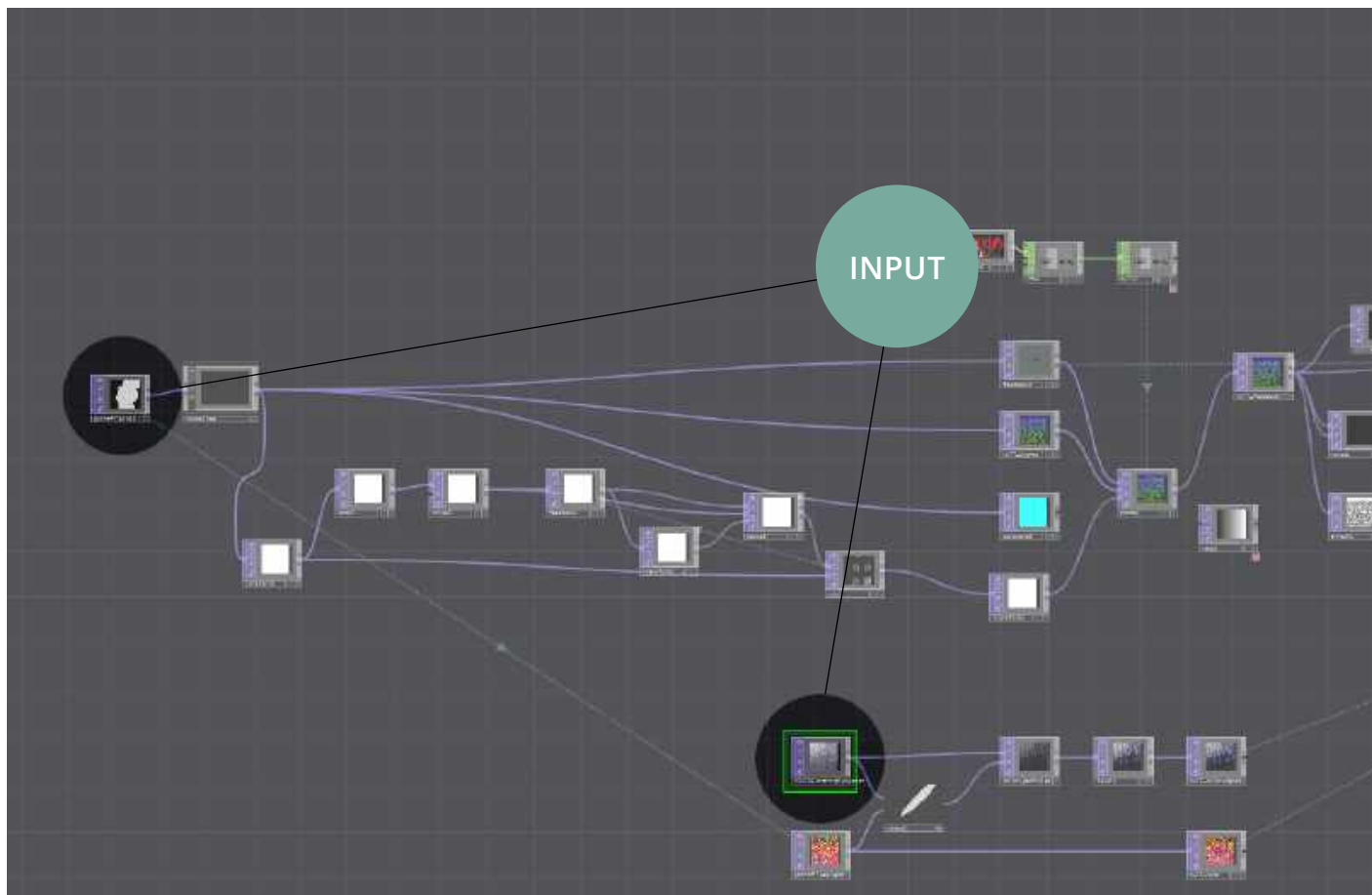
Figure 57. This last question led to the challenge of finding a tool that allowed to generate the aimed visualization for the chosen media. This tool is Touchdesigner (Derivative Inc., 2001), "a node based visual programming language for real time interactive multimedia content, developed by the Toronto-based company Derivative." ("TouchDesigner." 2020). Due to the possibility of generating content for both, projection mapping and VR, from this point on, the focus was directed at gathering and developing the data to use as input for this visualization.

OUTPUT

Prototype 1.
Projection mapping

Prototype 2.
VR visualization
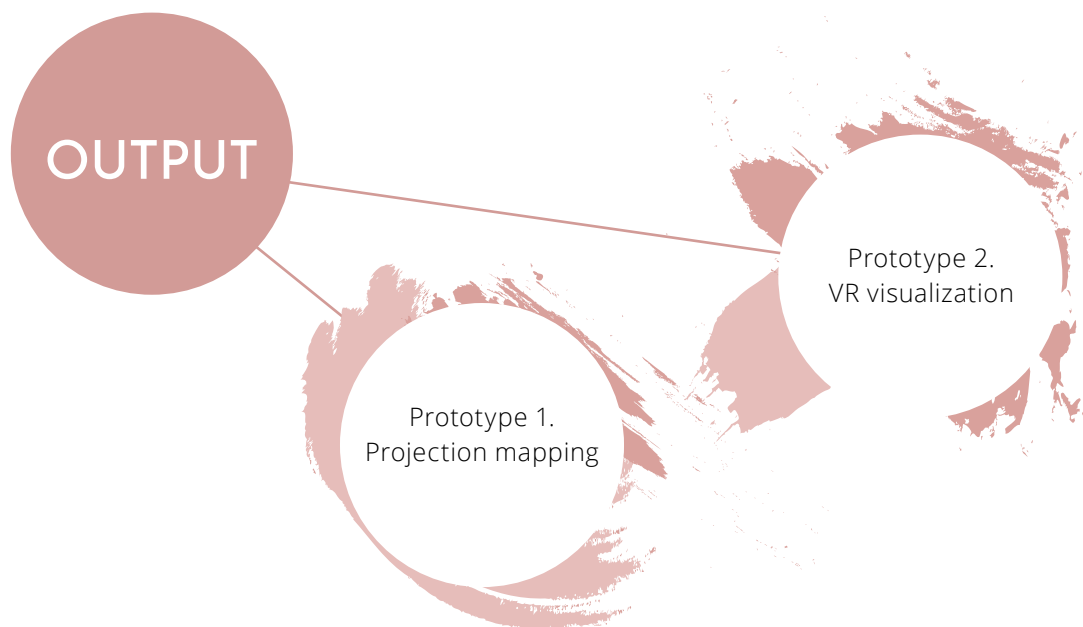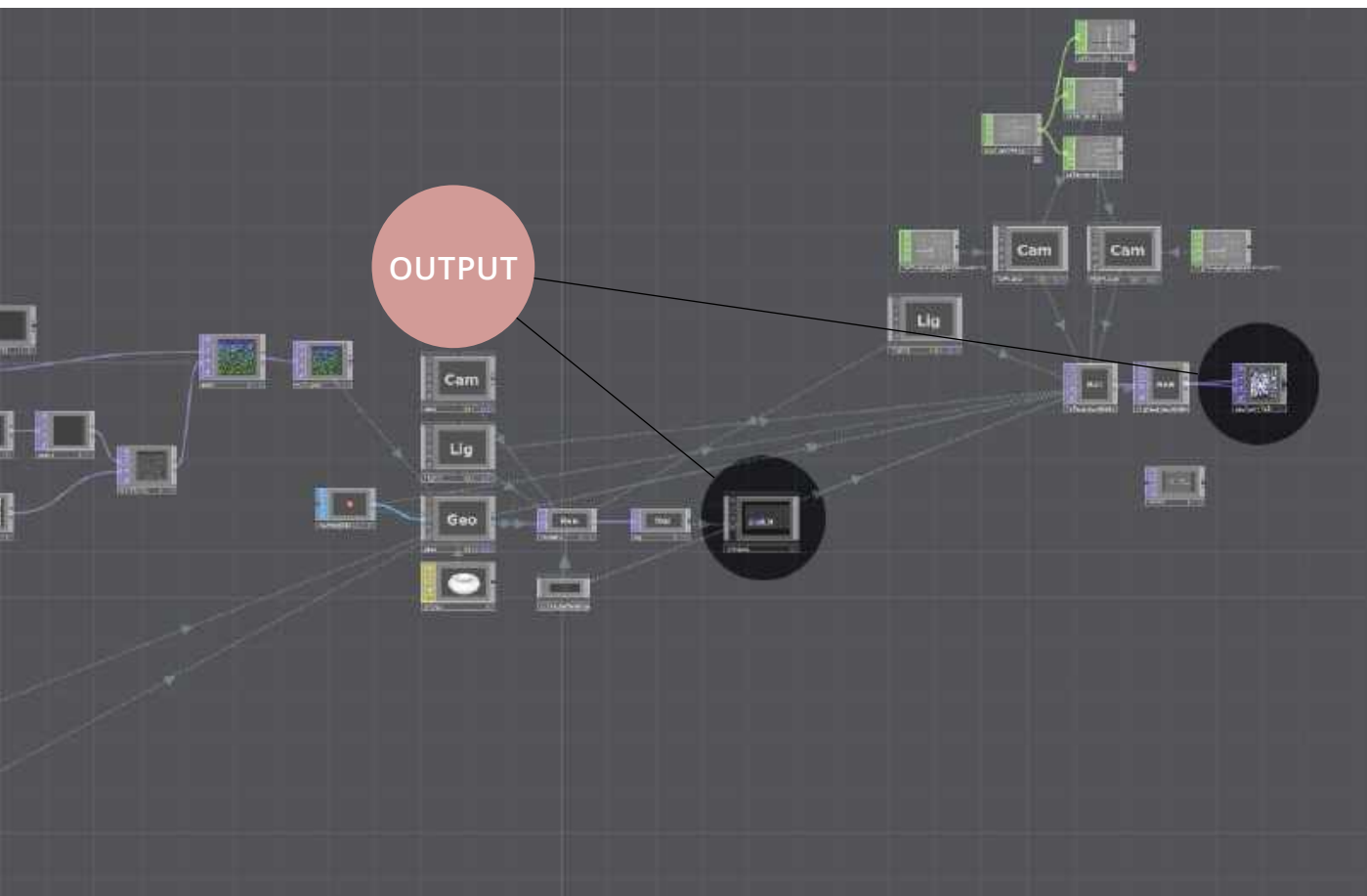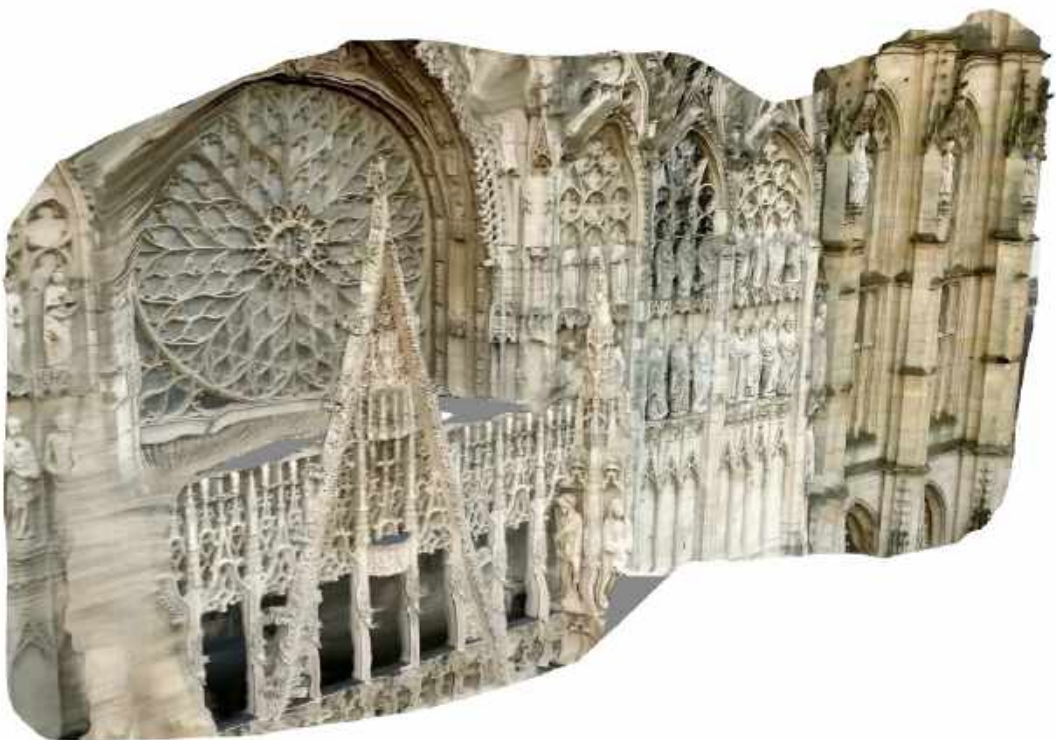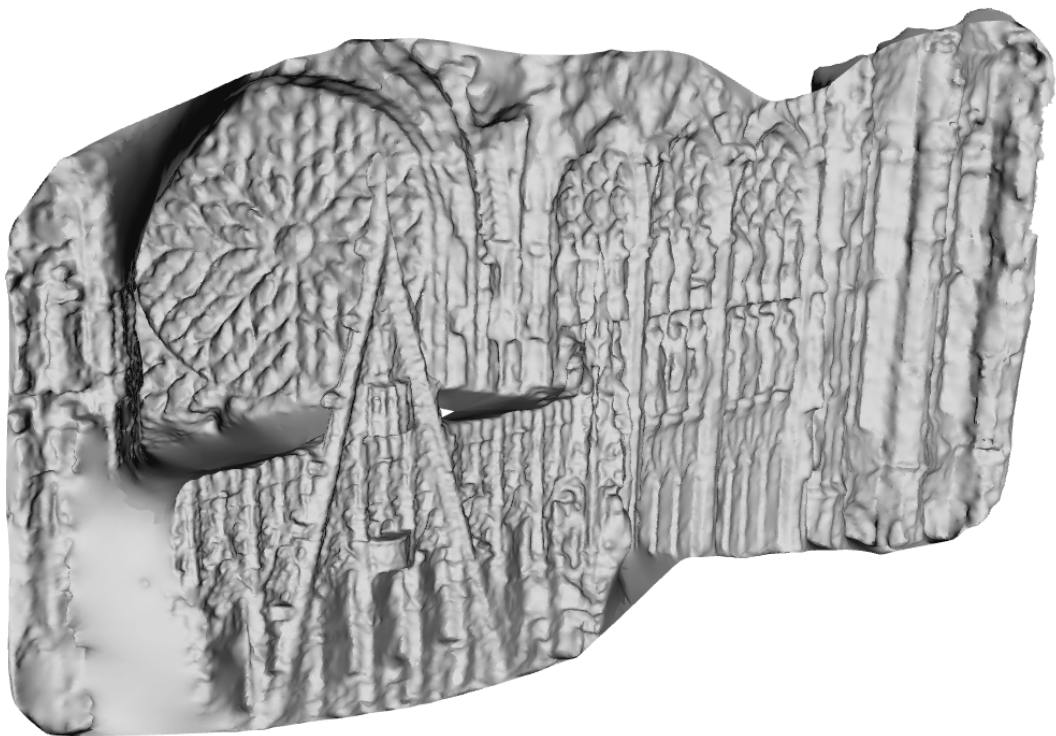
Data through photogrammetry: 3D out of 2D

Figure 58. The first strategy to generate data was Photogrammetry. It consists of retreiving measurements from photographs. The output is usually a map, a drawing, or a 3D model. In this last case, the generated model is typically in the form of a point cloud [Page 74].
On the left, this point cloud model was generated by extracting frames of video footage of the Cathedral and processing them through a photogrammetry software.
The upper image consists only of coordinate position data, which arranged by the software can be visualized as a surface.
The lower visualization also contains color data, for which it's considered to be 4D (Bogdan Rusu & Cousins, 2011).
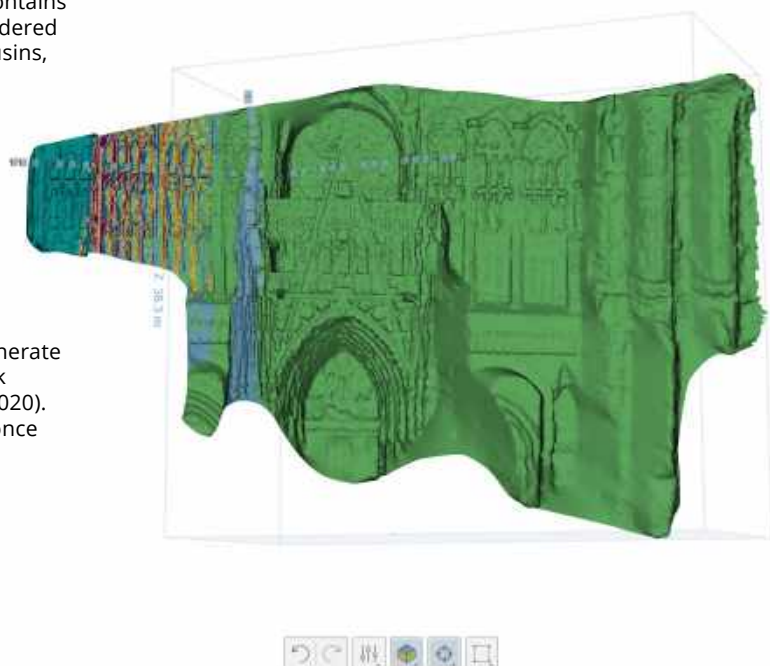
Figure 59. Right. The sofware used to generate these point clouds is Autodesk Recap Photo (Autodesk Inc., 2020). It allows to compare models once generated, as in this example.
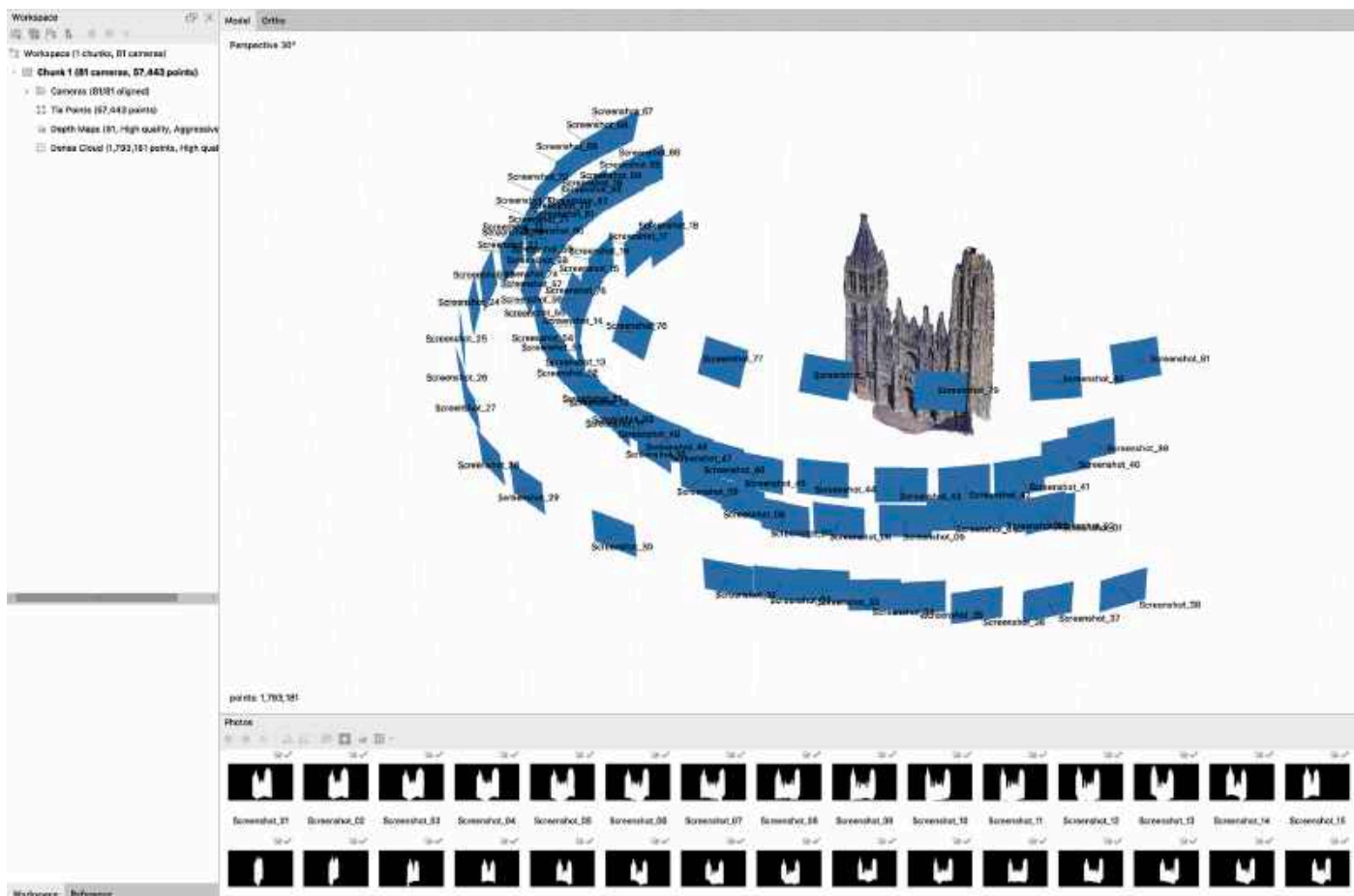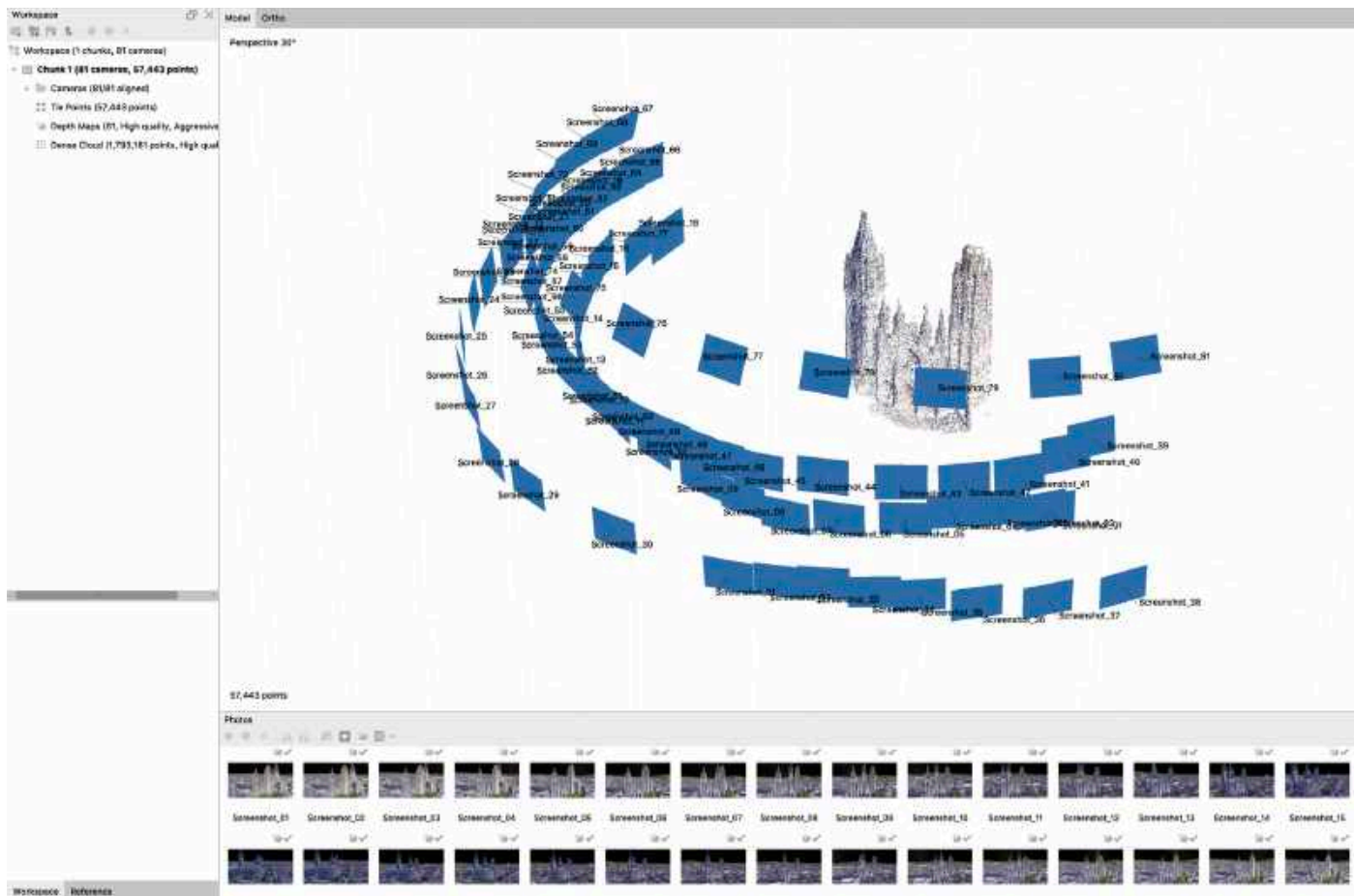
Figure 60. In order to include the whole Facade of the building, a second approach was tested by generating the input images with Google Earth views. In this case, surrounding the desired geometry, screenshots were captured and introduced in the software as 2D input. To test different point cloud model qualities and processes, this time the used tool was the open-source software Metashape Pro (Agisoft, 2019). In this image, the first result is a sparse cloud model, which represents a preview of the geometry, and depending on the resolution of the images can more or less accurate. A refining editing at this point reduced notably the generation time and accuracy of the next step.

Figure 61. In comparison, the dense point cloud generated through further editing was clearly more accurate. An important step in between was to generate masks of the desired geometry in an external image editor.
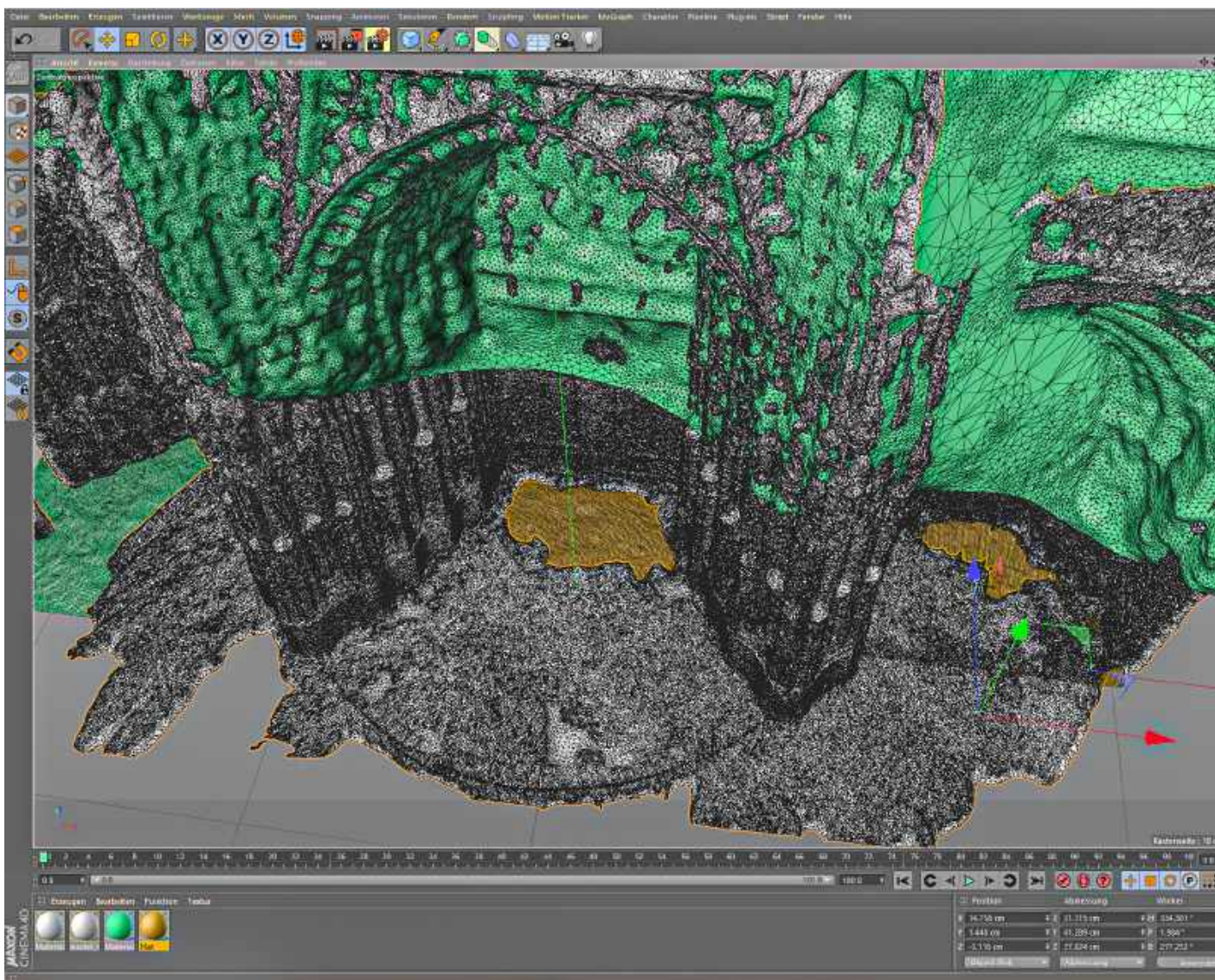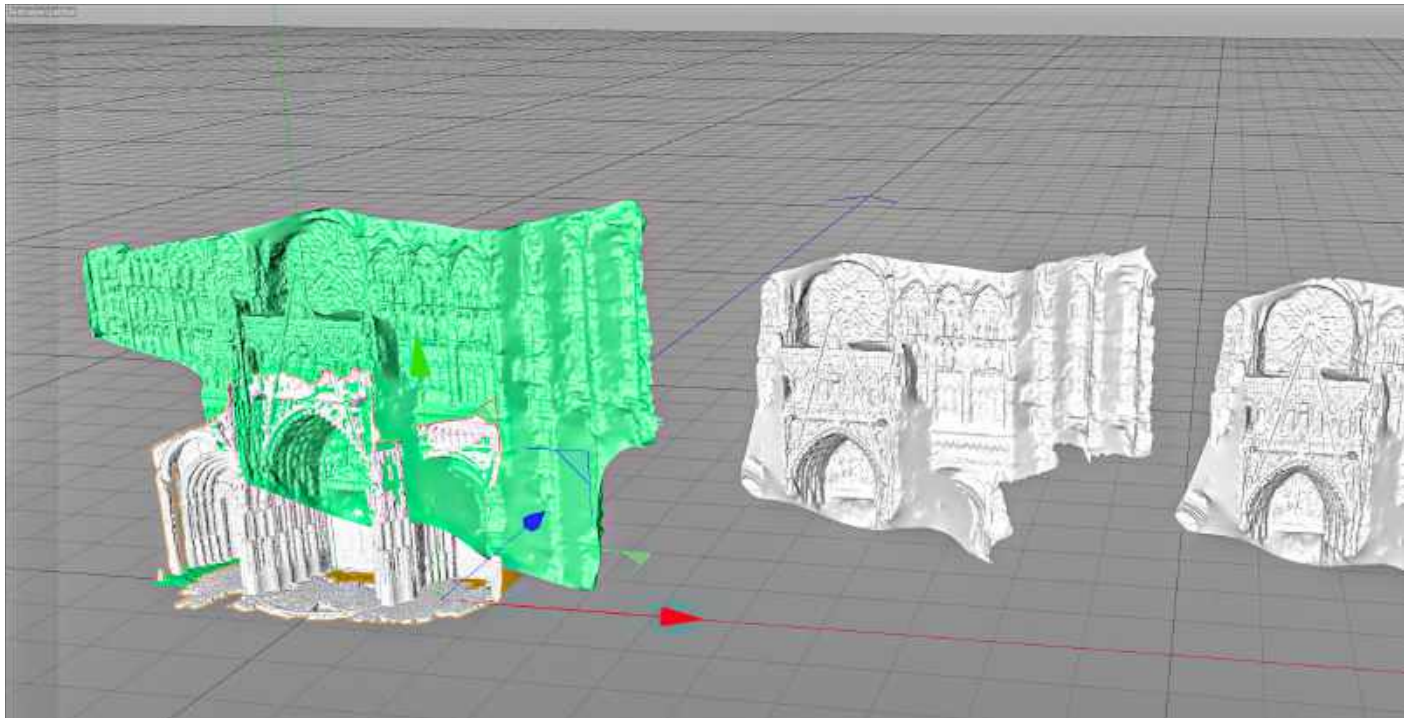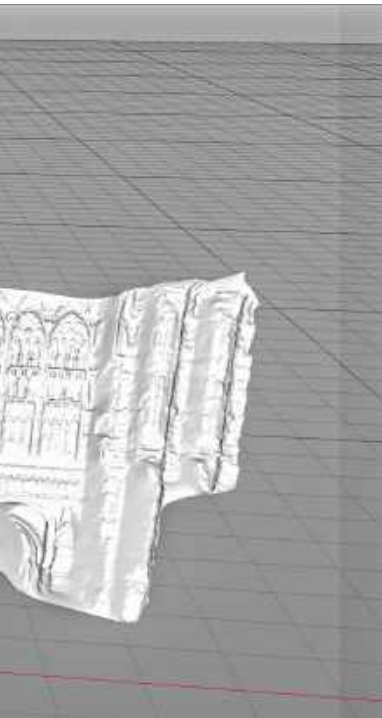
Figure 62. A second strategy to the generation of the point cloud model was to join and blend all the created chunks. Here, an external point cloud created by Dronopilot was retreived from a public database (Sketchfab, 2020) and incorporated to the blending process.
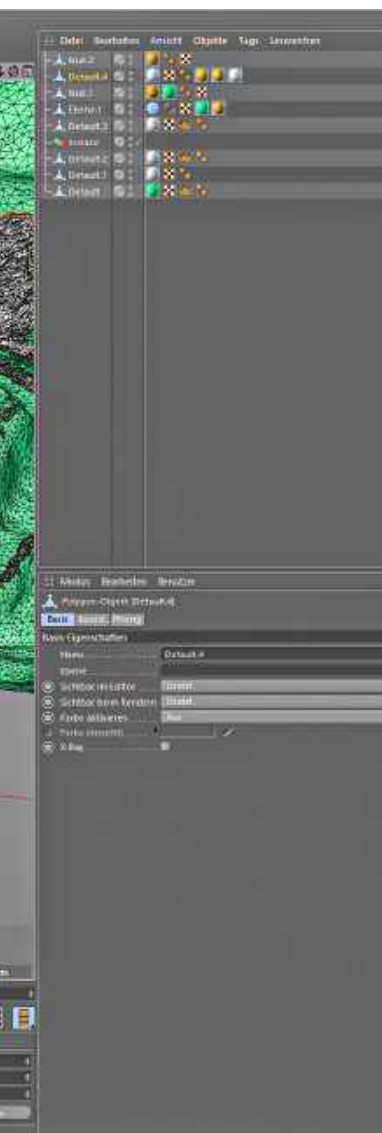
Figure 63. This process consisted of joining as seamlessly as possible all the independent models and it was realized using the 3D modelling software Cinema 4D (Maxon, 2020).
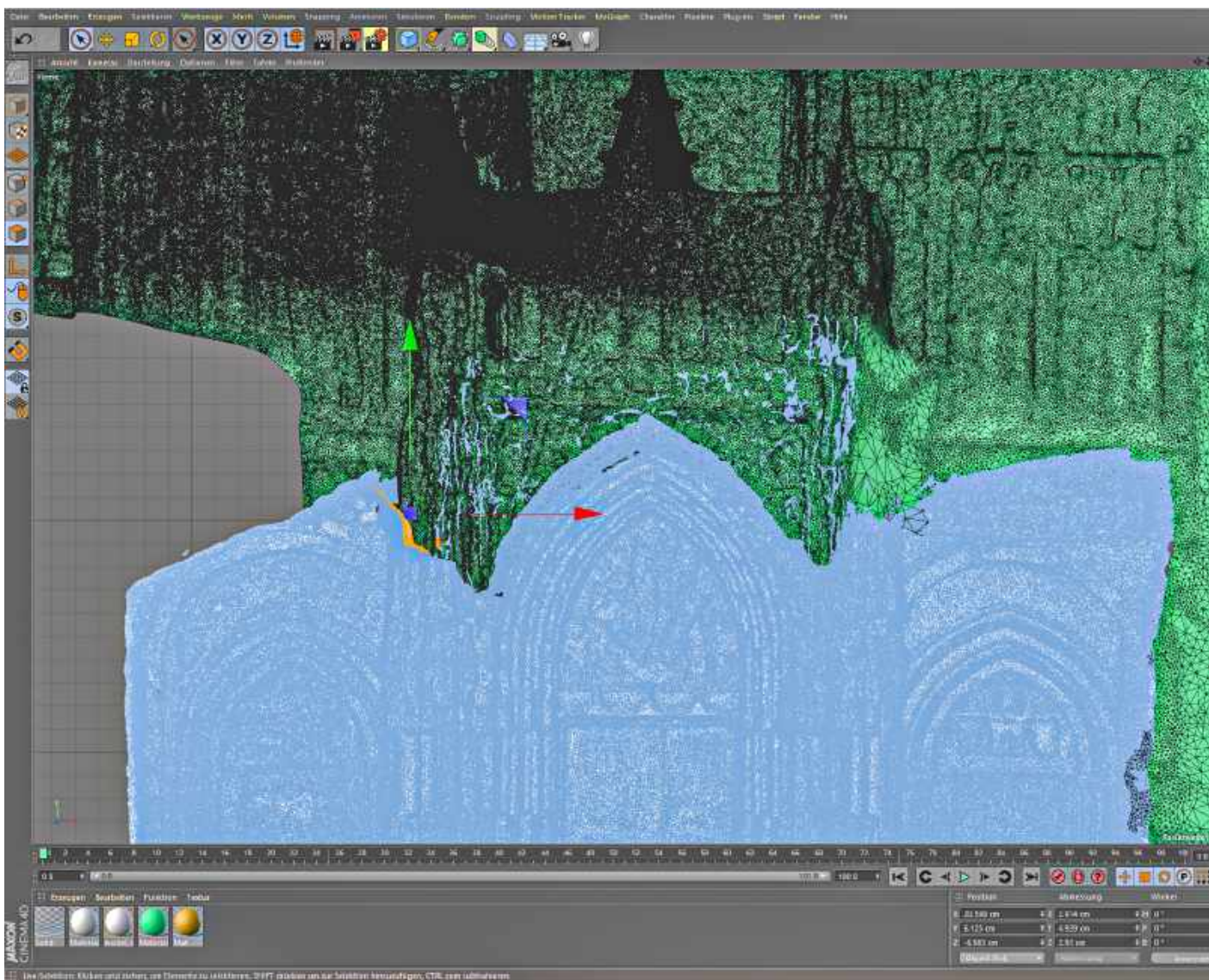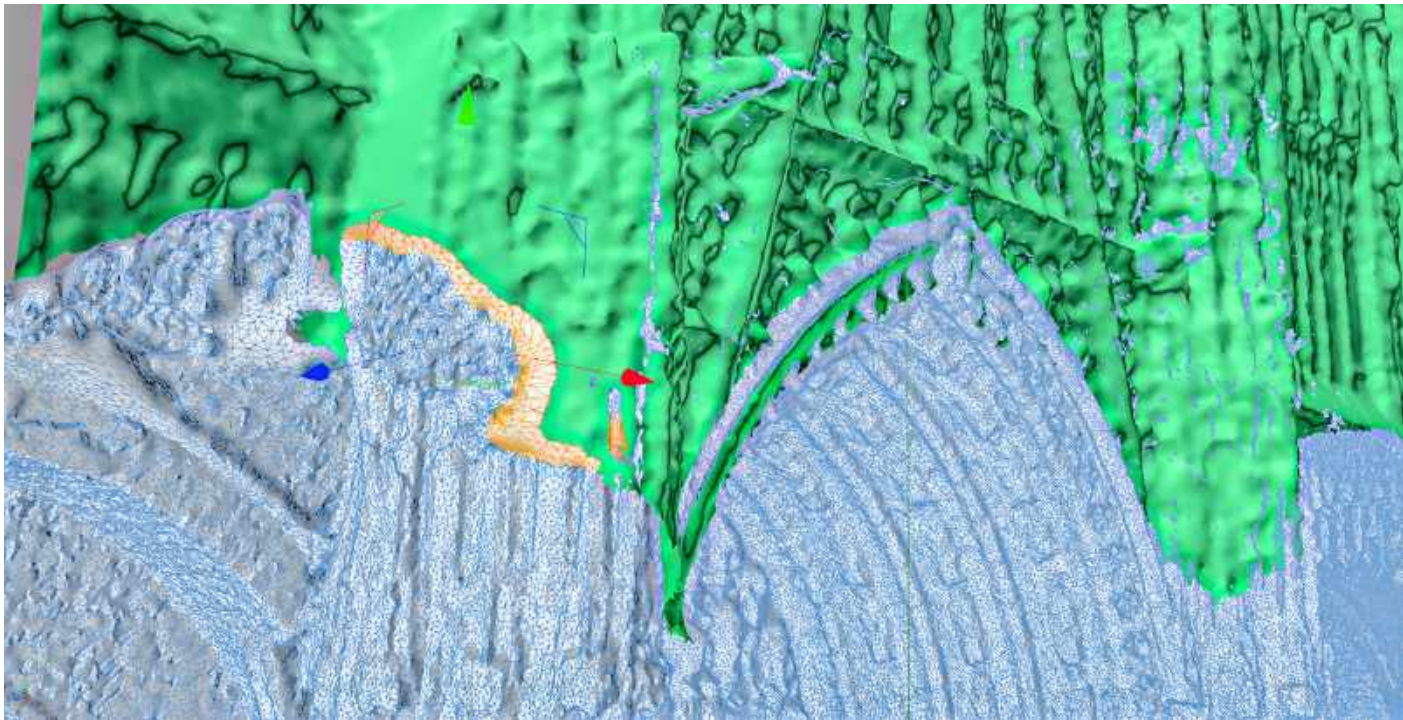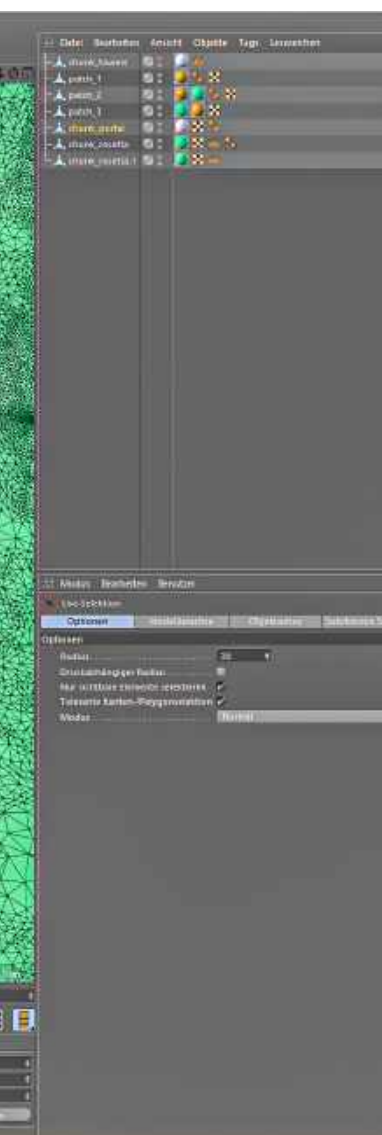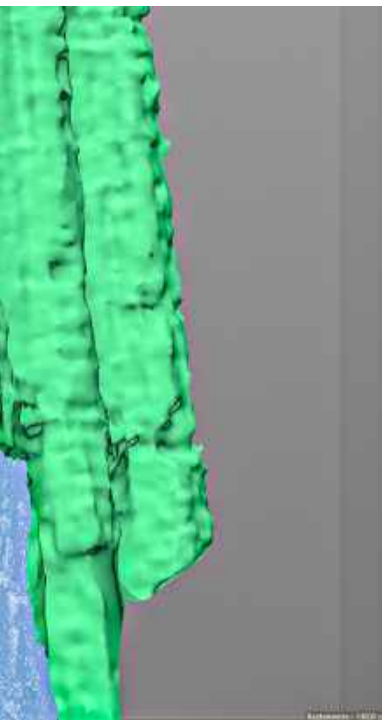
Figure 64. At this stage, all overlapping geometry was removed. The criteria was to keep the most detailed parts of each model.
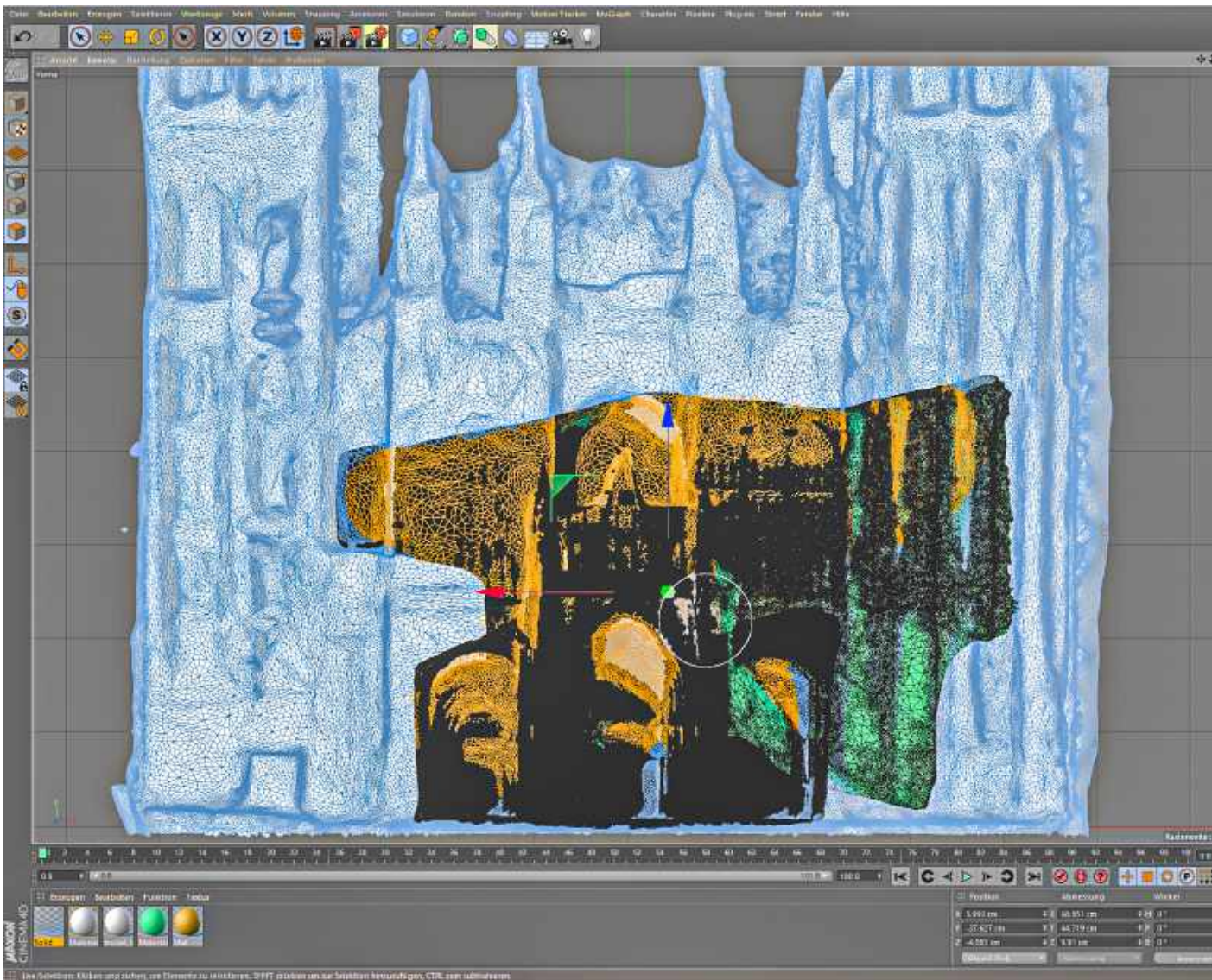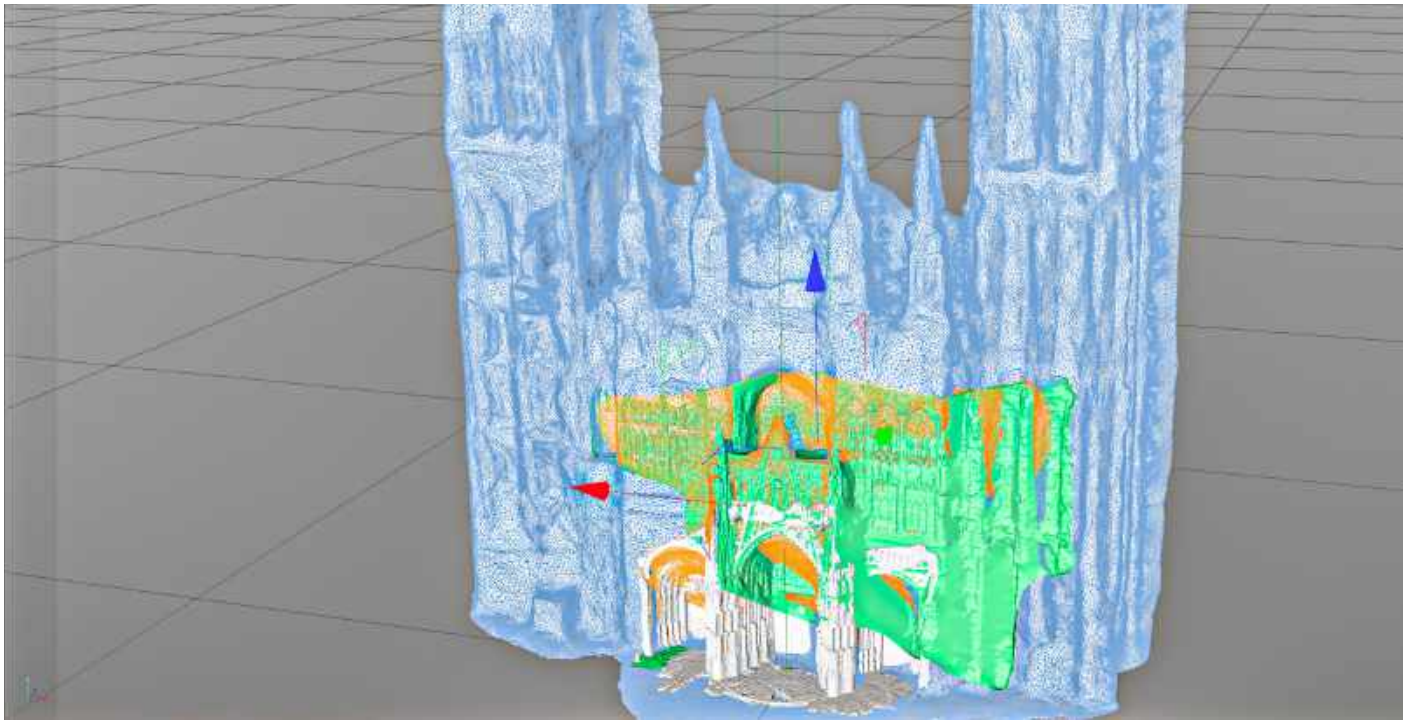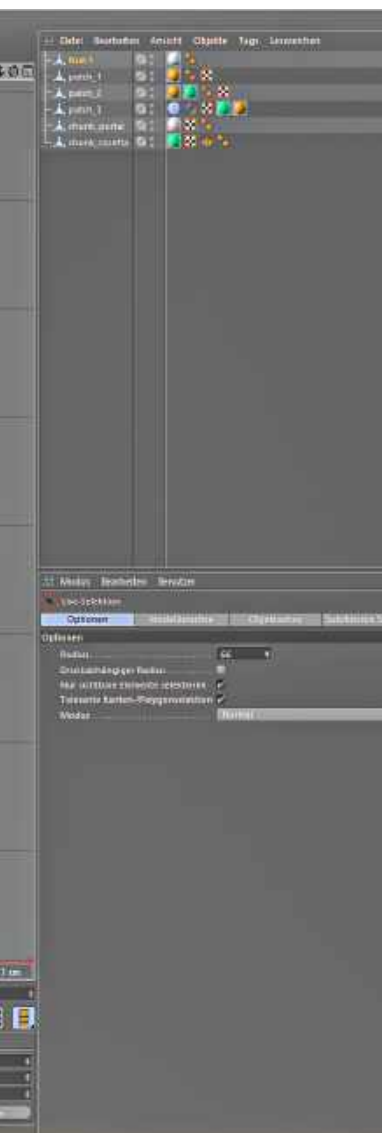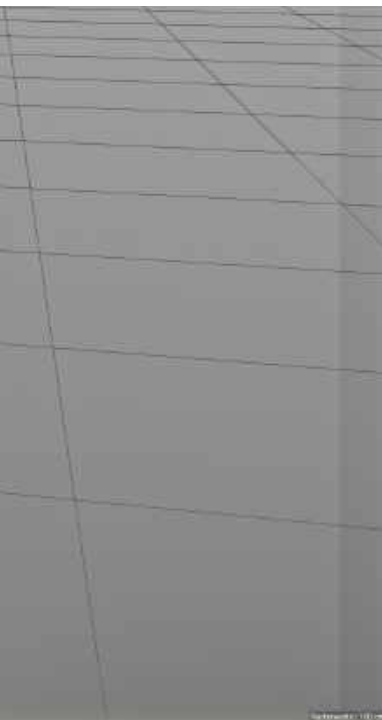
Figure 65. The point cloud model generated through the images retreived from Google Earth was had a noticeable lower resolution in comparison with the other. For this reason, it was further edited at this point of the process, tesselating its mesh.
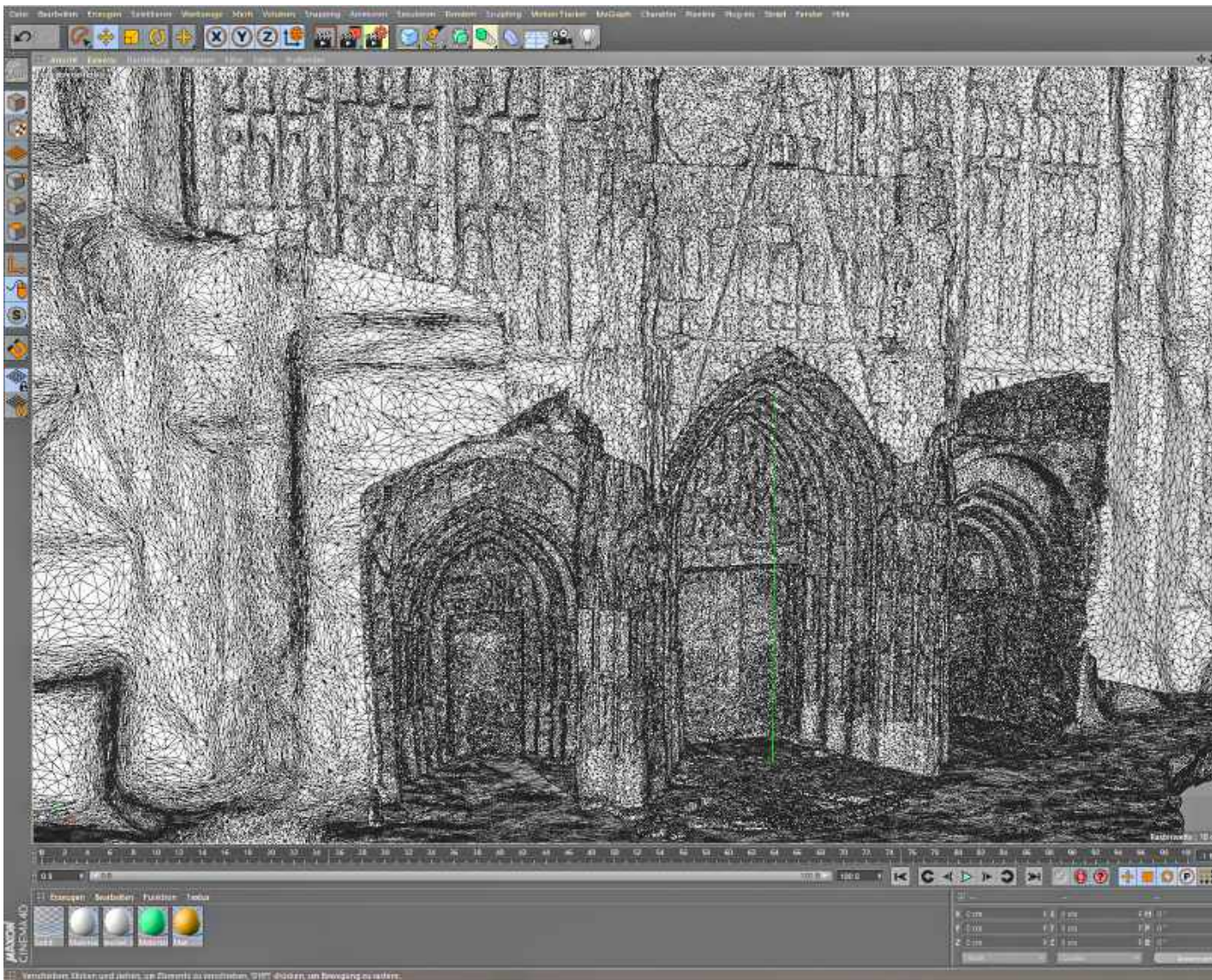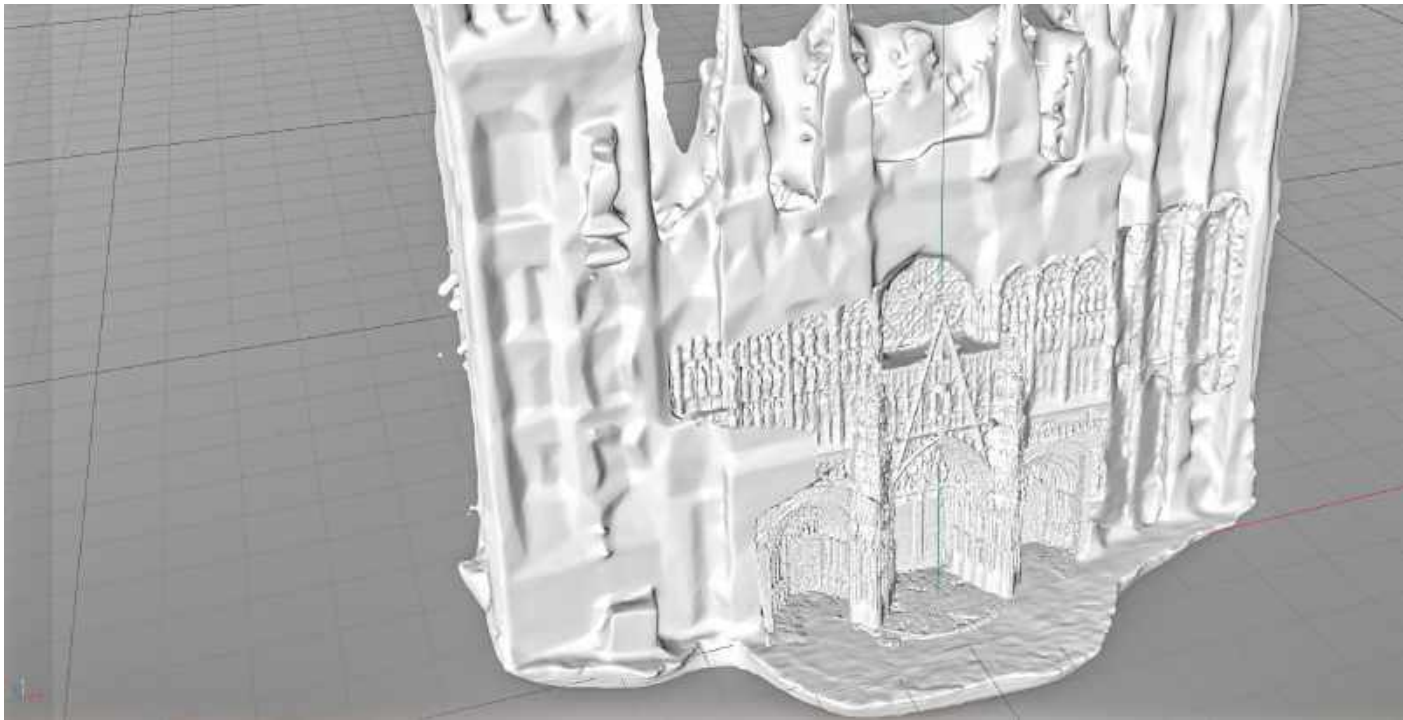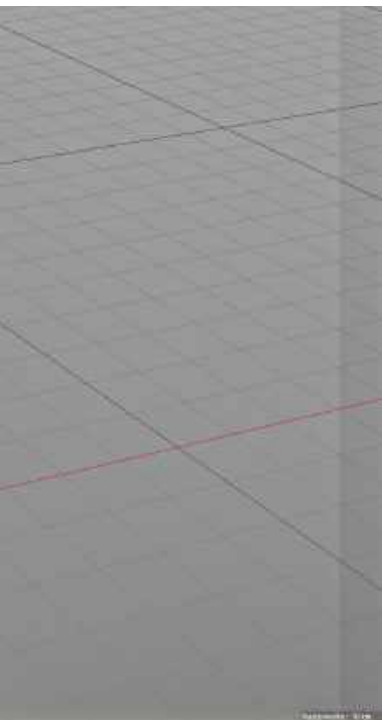
Figure 66. This tesselation would not increase any details in the surface but it generated more points to the cloud, which in this case, had a priority for its processing in Touchdesigner.
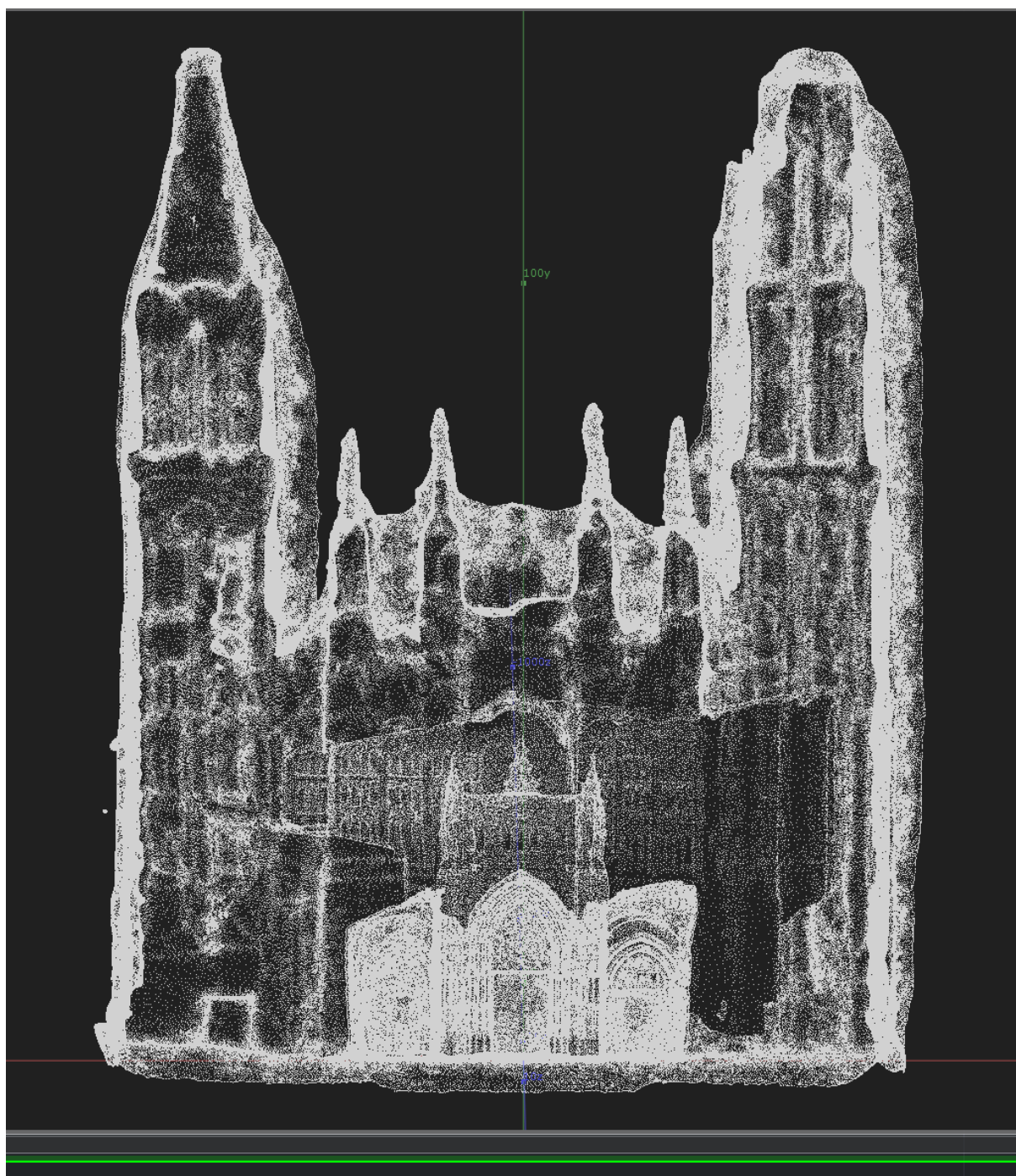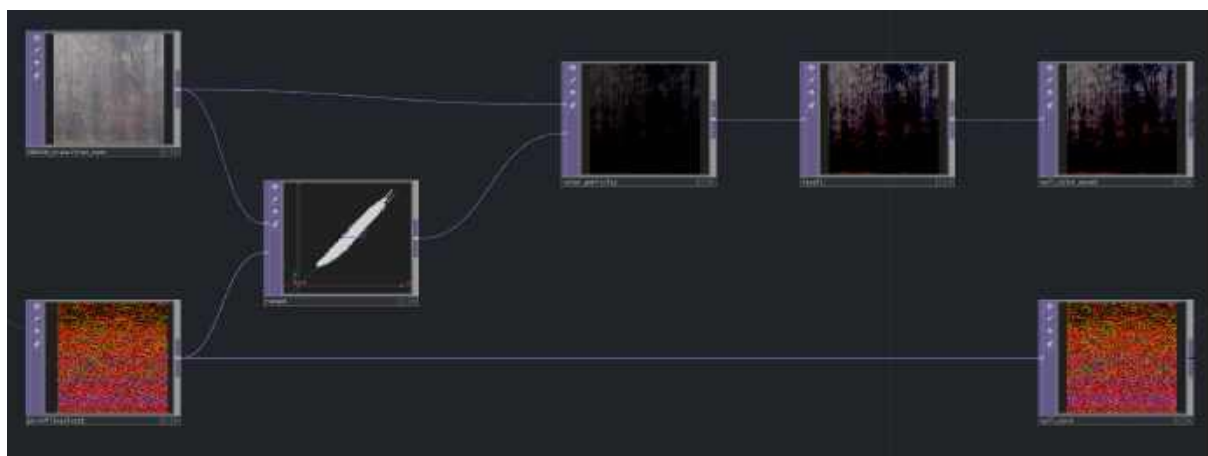
Data through image processing:
the Cathedral Series

———————

Figure 68. The images of the cathedrals were then mapped as a material input for the point cloud model. These were retrieved from an external folder as a group, which allowed to visualize them in the form of a sequence. The sequence is placed in the order that the artworks were documented.
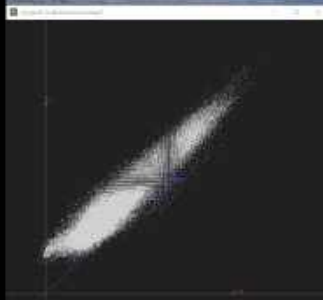
Prototype 1.
Projection mapping

———————

Figure 69. In order to output the content processed in touchdesigner, the first step was building a scaled model (1:200) of the cathedral, responding to the resolution of the device available to build the prototype. This device is a Pico Projector P300 from AAXA.

Figure 70. The setup to realize the tests responded to practical reasons and use of the available resources. It gave a notion of what could be posible when realized in a higher scale and would be suitable for exhibition purposes as a standalone installation object.

particles appearing
^
(subtle)

particles appearing
^
(increasing in number)

cathedral
point cloud
slowly appearing

until
entirely rendered
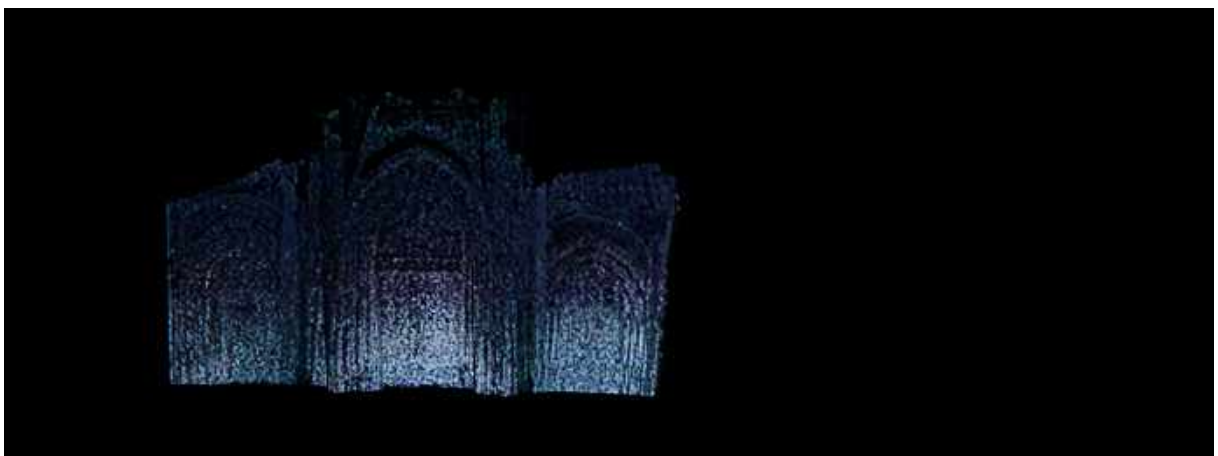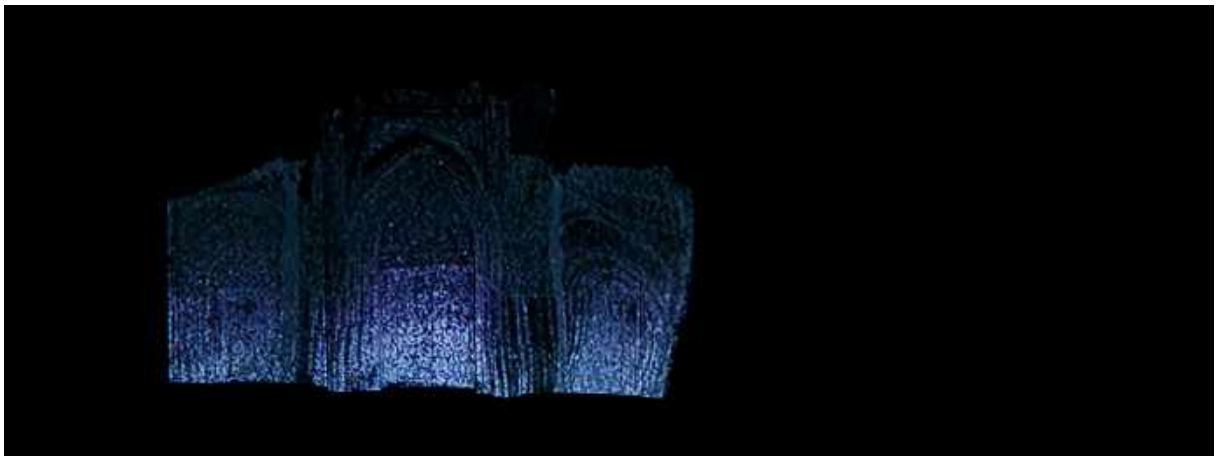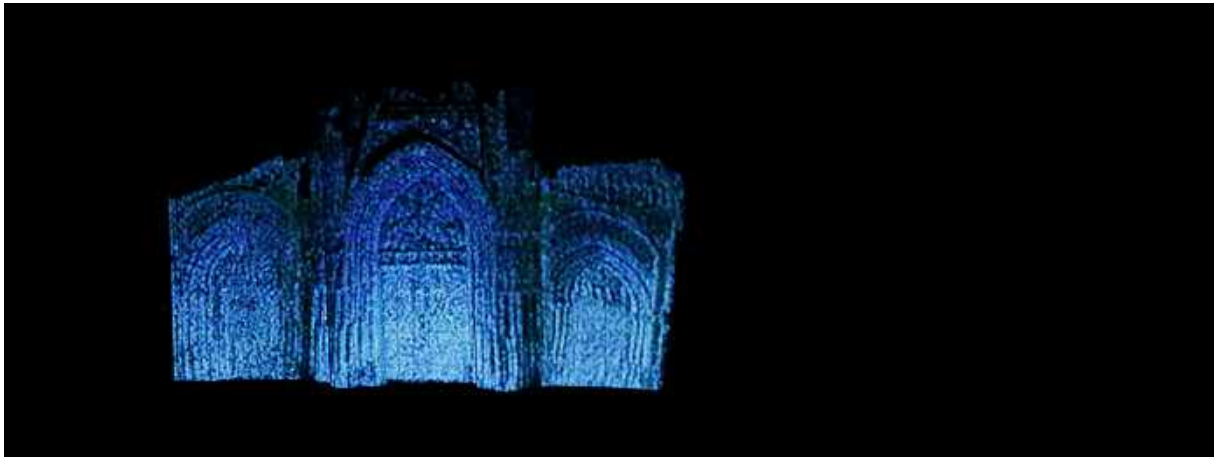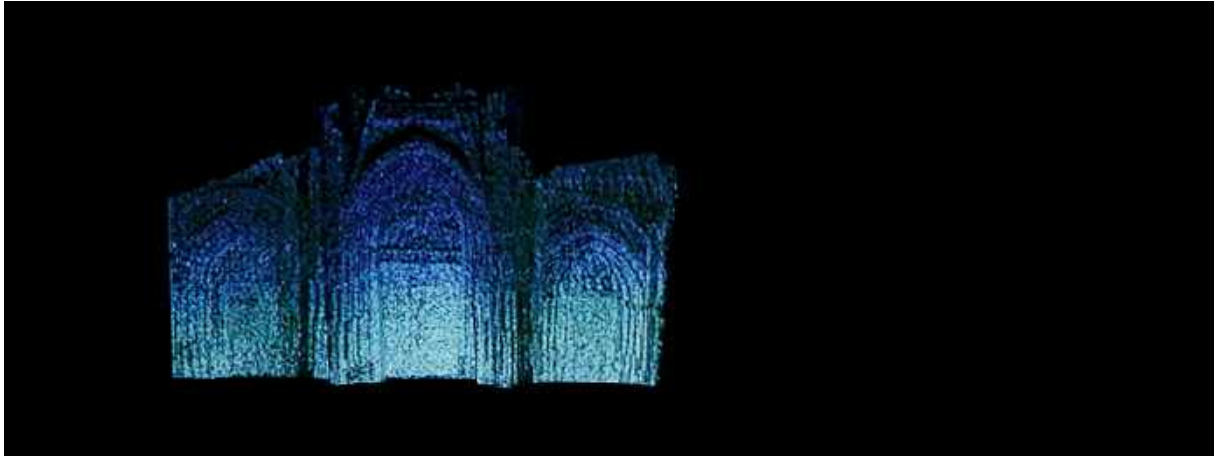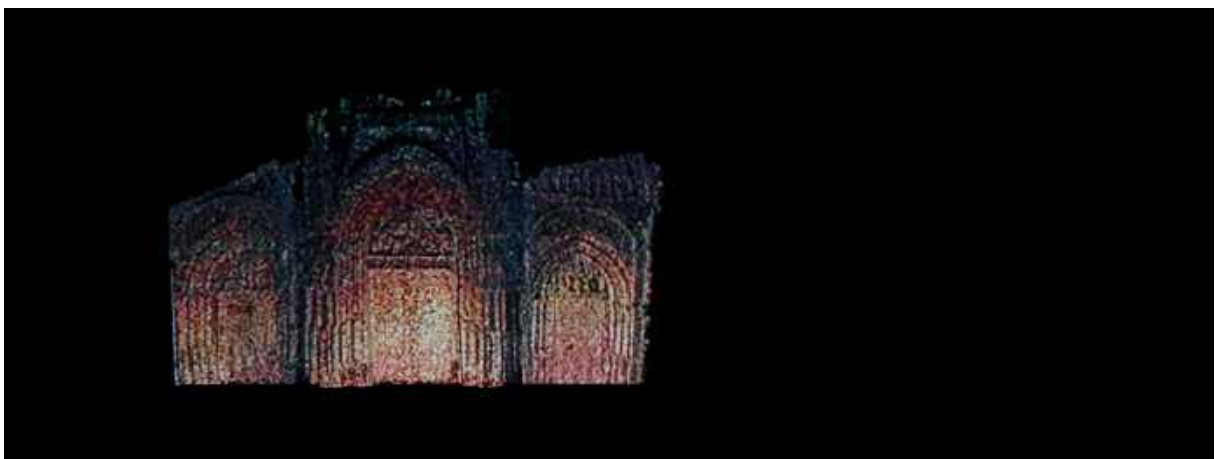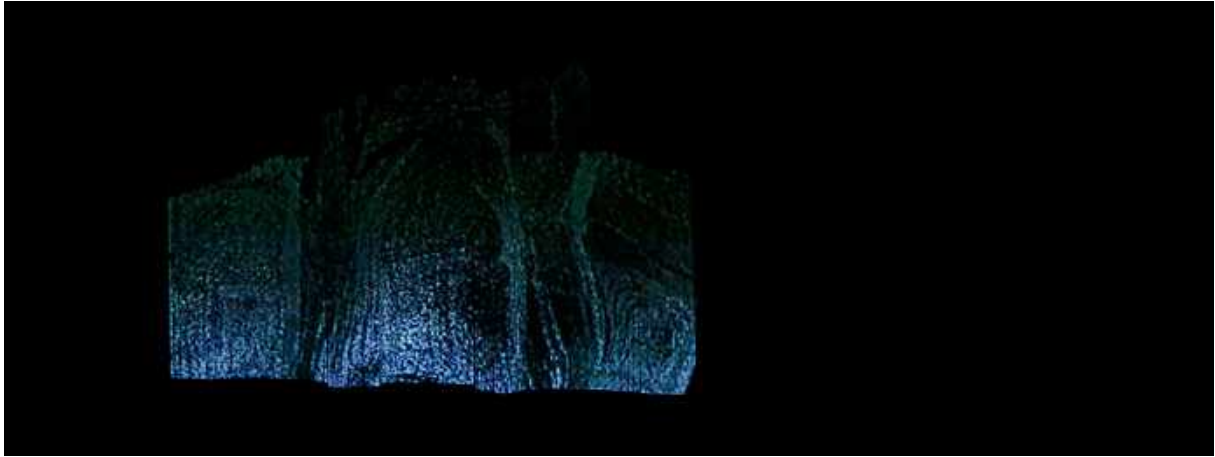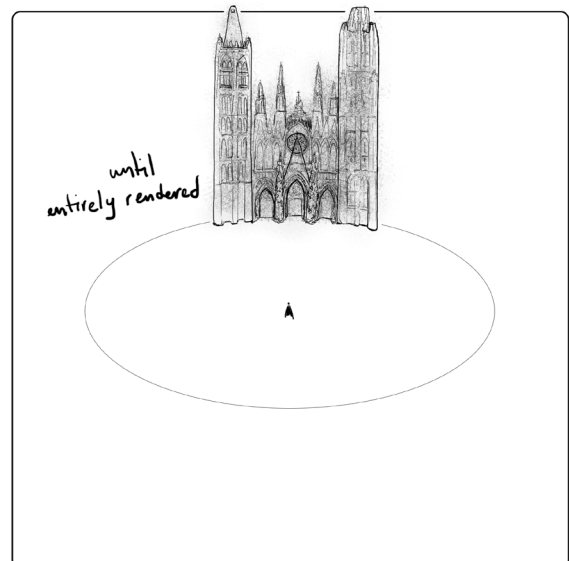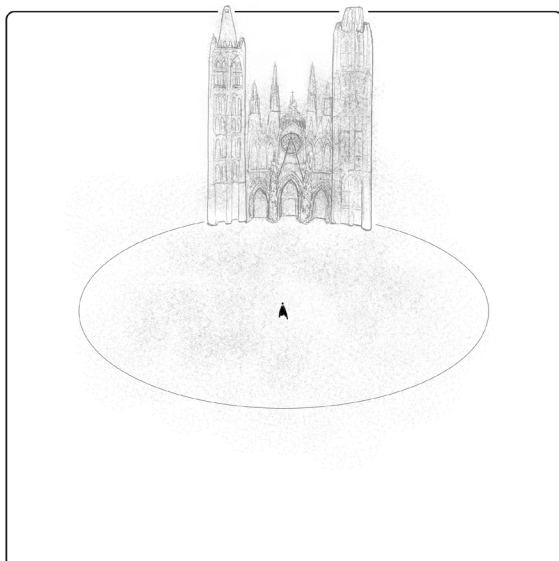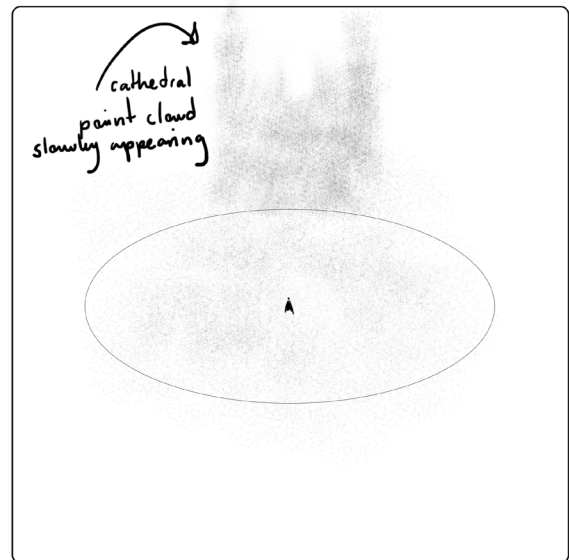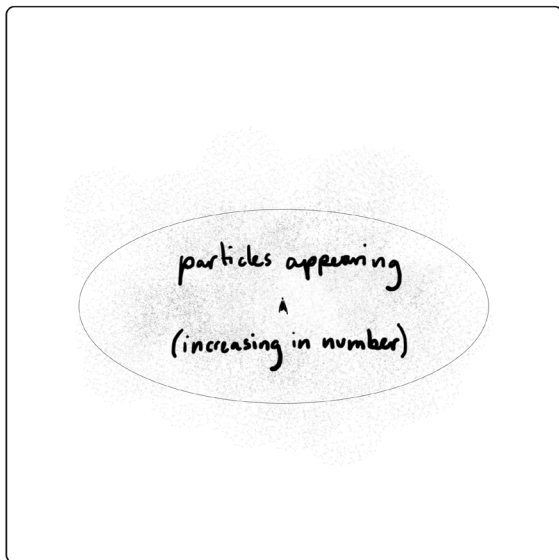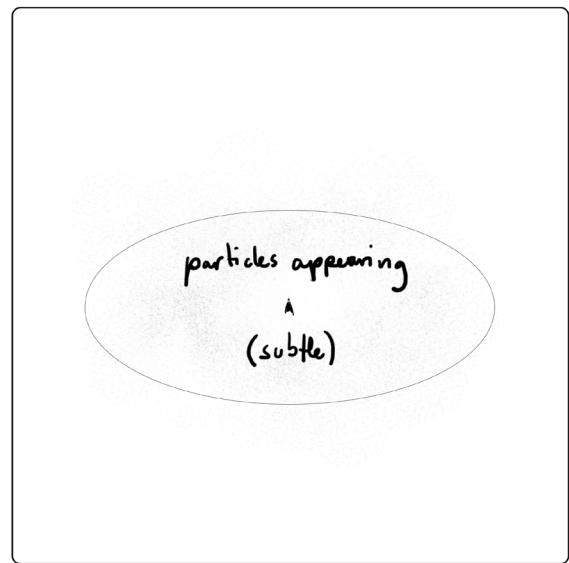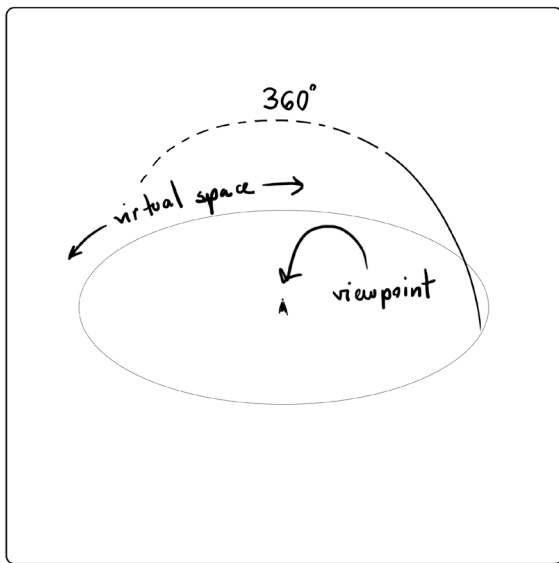
Prototype 2.
Virtual reality

─────────

Figure 71. Due to the limitations of scale, from this point
on, the focus was directed at the second
prototype, in order to explore effects of
immersion.
This illustrations show a storyboard for the
VR prototype, which outputs the processed
data through a head-mounted device.

particles dissolve
out of the cathedral
to approach viewer

and pass through
viewer to continue
their 'path'...

... as the cathedral
vanishes

... to dissolve in a distant point

which represents the original
location where Monet
depicted his impressions
of the cathedral

after a few seconds
particles slowly return

and give shape to
the cathedral again

Monet's Cathedrals Series
sequence continues

...showing the brightest palette

...showing the brightest palette

...showing the brightest palette

...showing the brightest palette

...showing the brightest palette

...showing the brightest palette

l'enveloppe...

...the same light diffused everywhere

Figure 72. Through an Oculus Rift HMD, the real-time rendered visualizations are displayed in transitions as shown in the storyboard. The user is immersed in a human scaled illusory space, where the cathedral is formed and deformed into an envolving set of particles that move along and partly react to the tracked position of the user and an audio input.
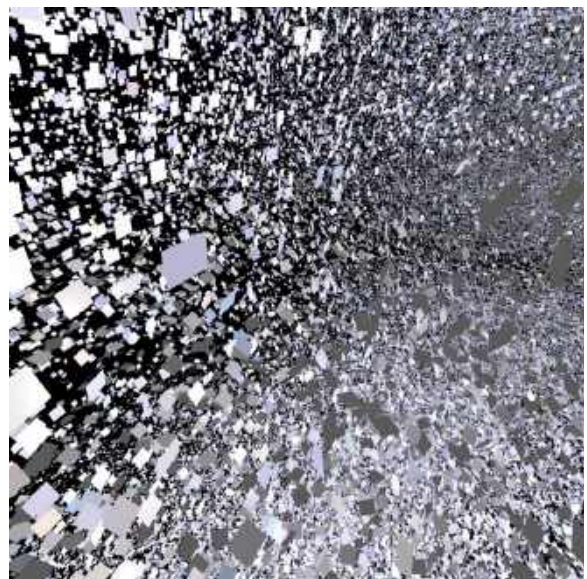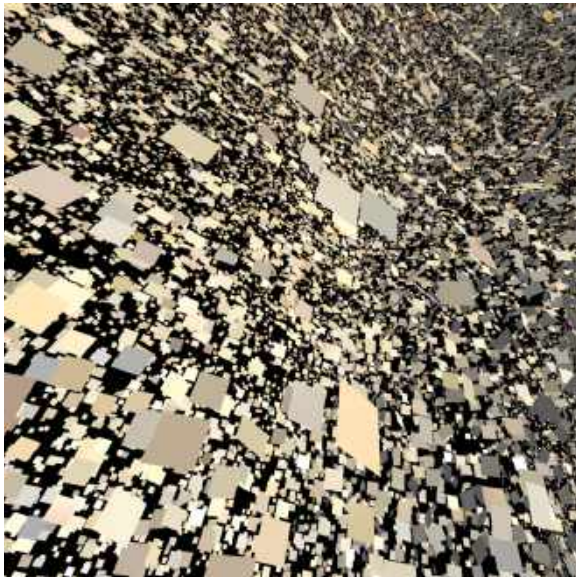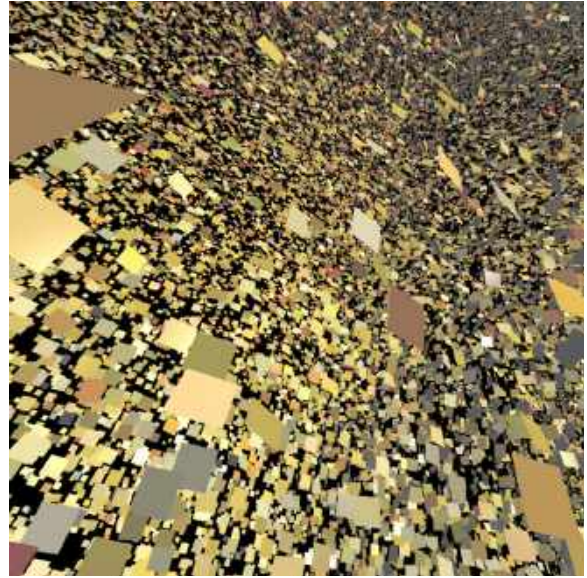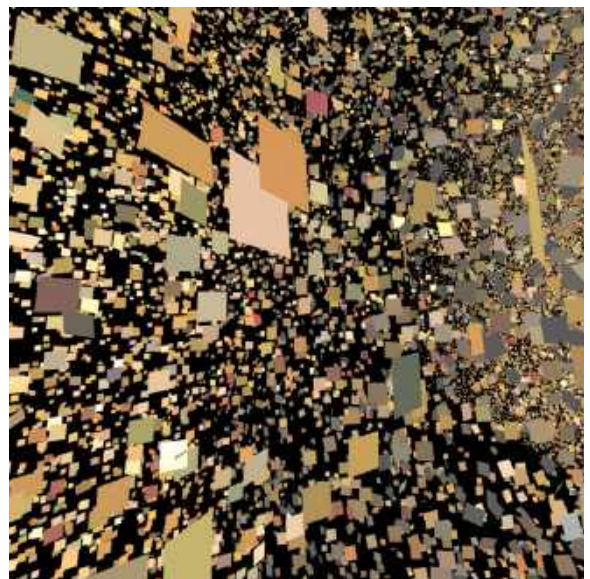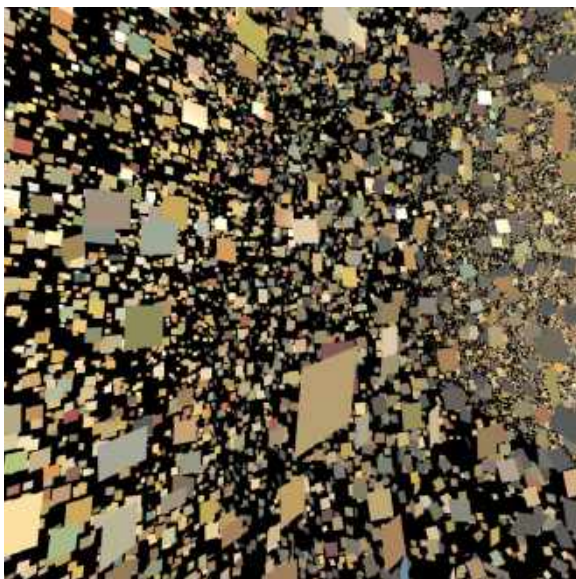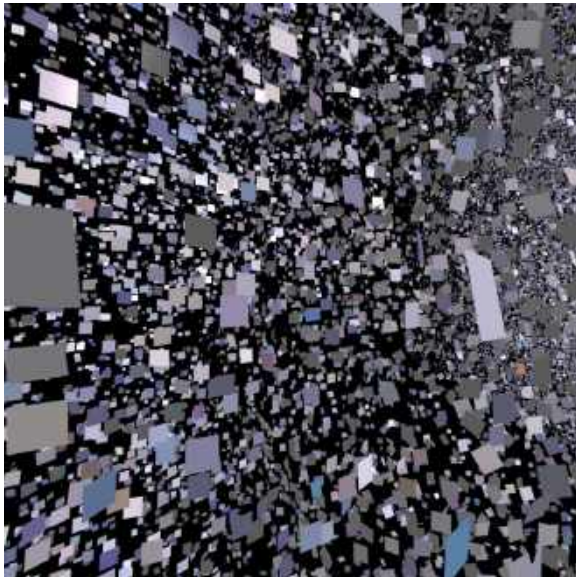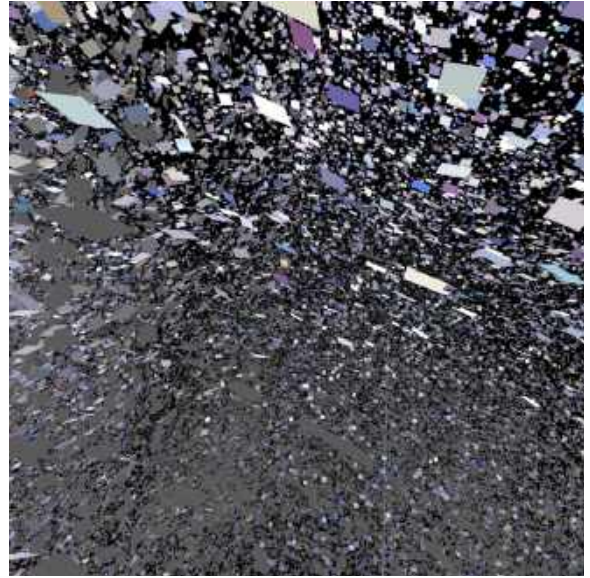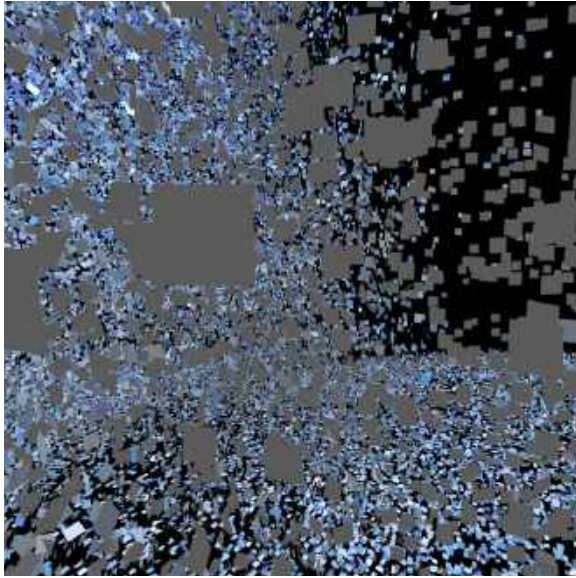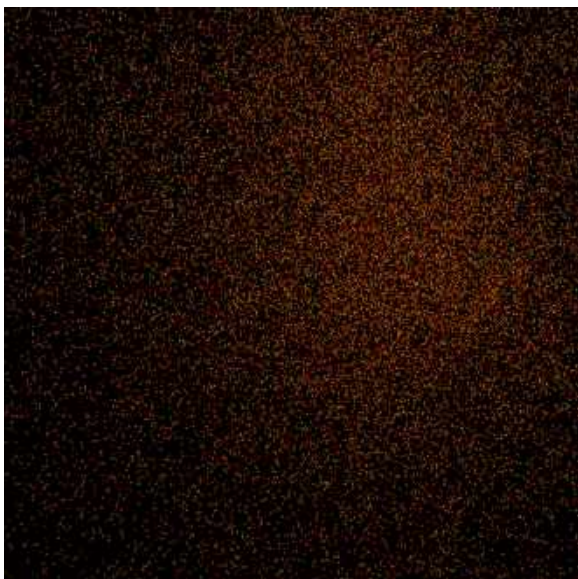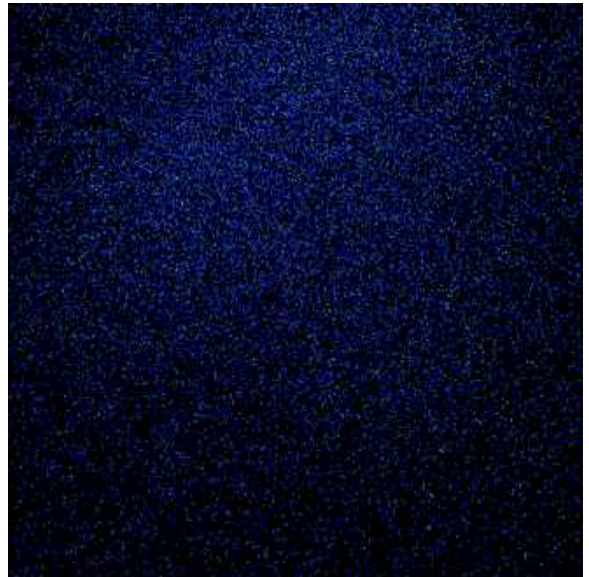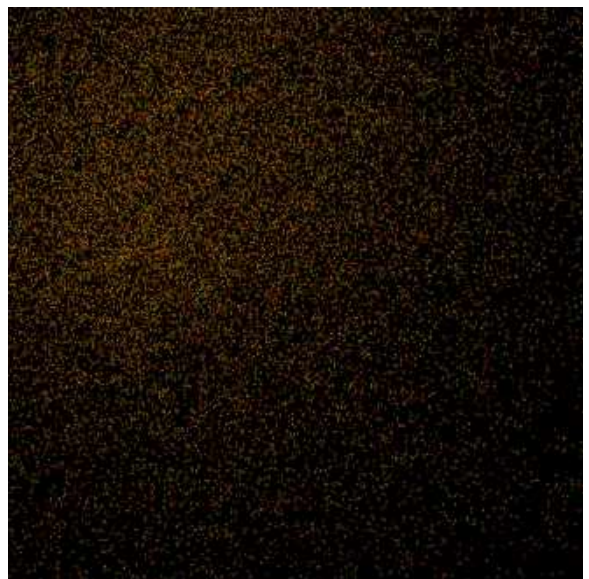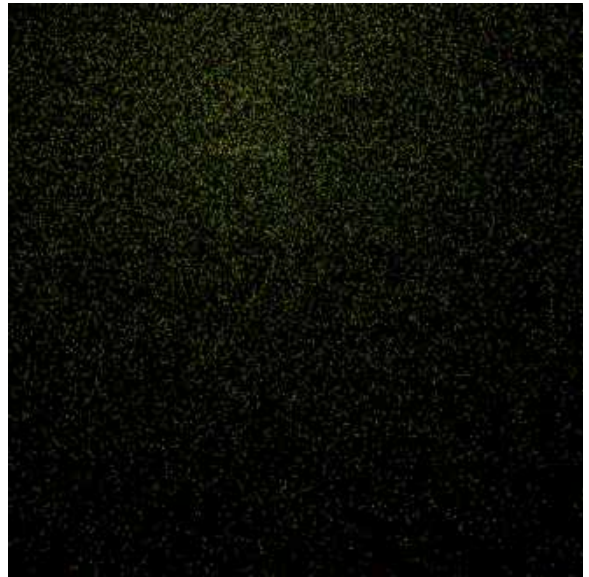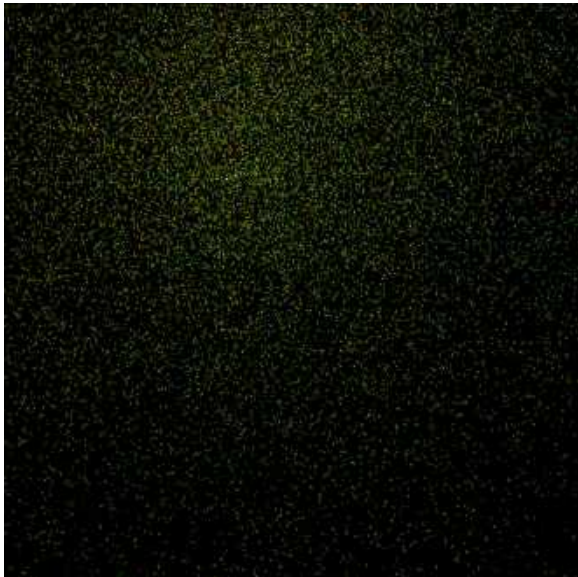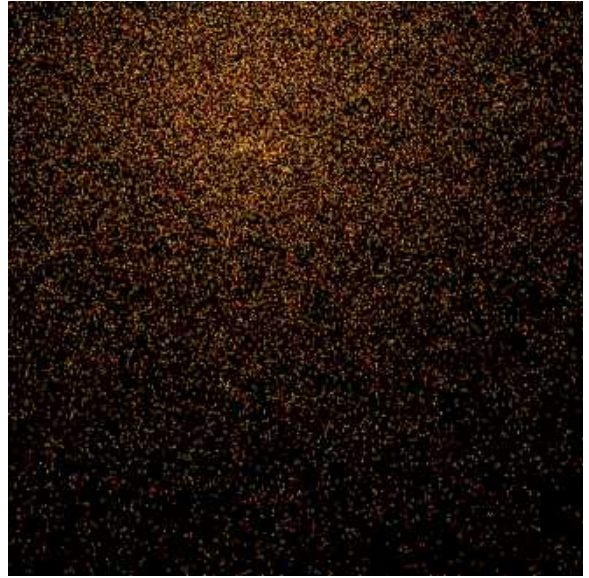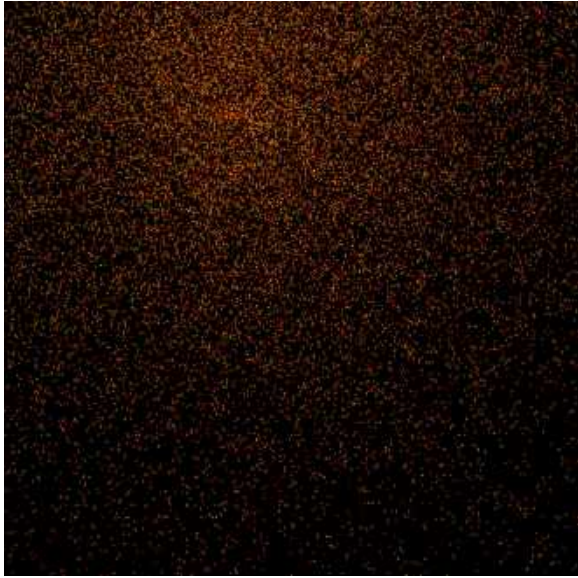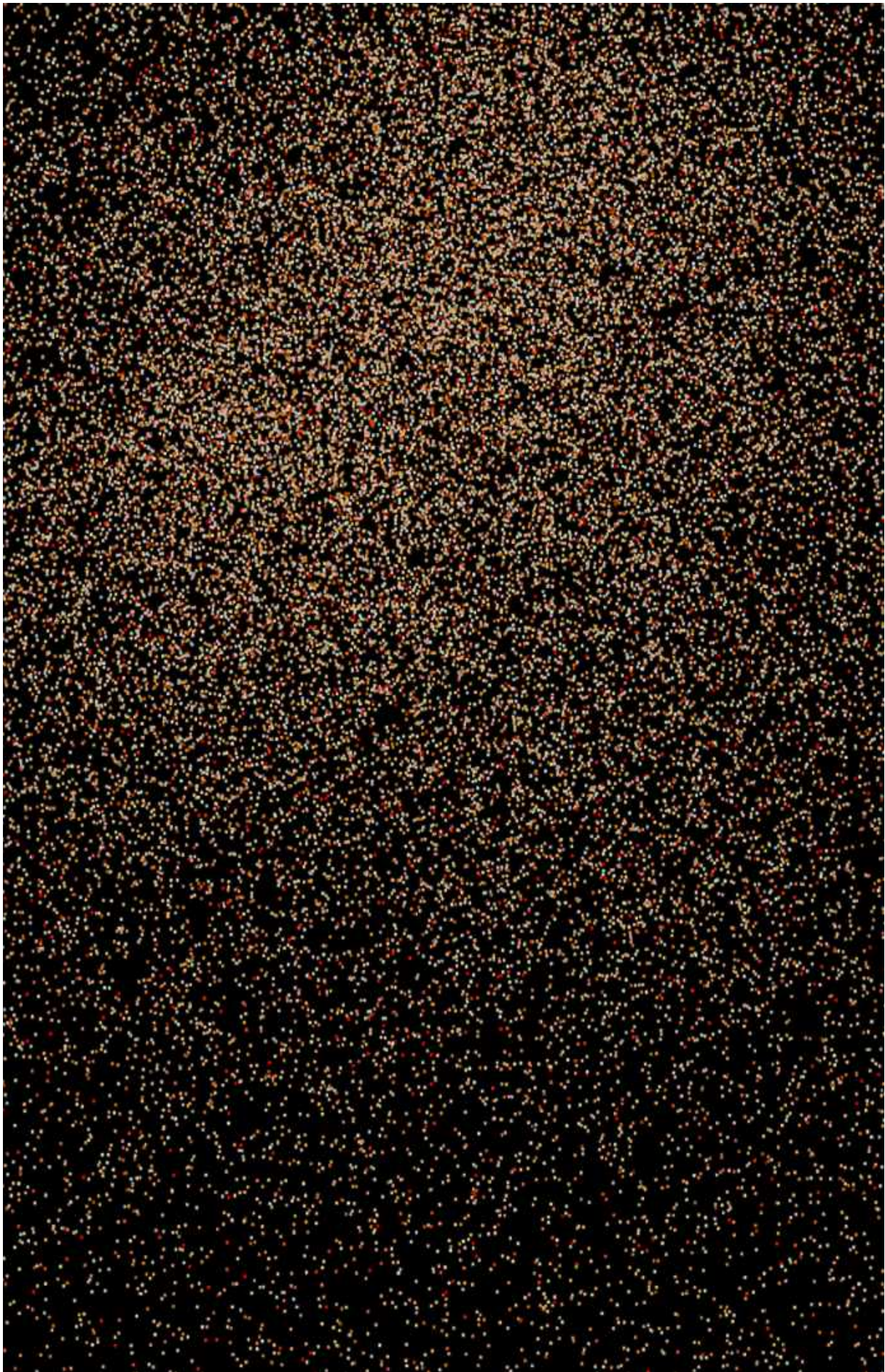
Few art movements attract people the way Impressionism does. Coming out from an exhibition on Monet staged at the Museum Barberini in Potsdam, my thoughts wander between two issues. First, how could this venue be so crowded on a Monday morning, and second, how come that the craft of a man is still received by the audience with such excitement and expectation as if the canvases had just left his studio, as if none of us had ever taken a glance at these images before.

The explanation for such happening might be found on the relationship between the creative process that Monet documented in his letters and our own perceptions. When this academic journey first started, I was eager to understand —at least on a funda-mental level— the narrative behind such a creative process, and not just Monet's, but that of impressionist painters. However, in the particular case of Monet, I thought that the accurate description of his intentions while painting, and the way his artworks after over a century still attract and mesmerize audiences cannot be pure chance.

Monet's pursue of depicting the *enveloppe* encompasses these intentions. How that trans-lates into the actual moment of beholding an image that conveys this narrative is hard to put into words. But once you have read the argu-ments on that notion and stand in front of an artwork that succeeded these thoughts, it all makes sense. Perhaps that is the trigger; the moment in which the viewer's own perception meets that part of the piece that still carries the artist's perception, completing it. Then again that feeling, *the one of being transported, the message being conveyed.*

Between perception and cognition there is an important difference though. As stated at the end of the first chapter when understanding immersive media, *because of the profound individual nature of perception, anyone can only speak from their perspective when experiencing something*. For this reason, in terms of cogni-tion, the assumption of the *enveloppe* being the artifact whose depiction causes an immer-sive effect in impressionist artworks lacks of scientific proof. Nonetheless, this is not a scientific work. By no means is this meant to underrate the efficiency of that method, but —as stated at the beginning— the aim was pointed at understanding the concept from an empirical approach, exploring whether it could be equally translatable to current possi-bilities of data visualization through immer-sive media.

The very first set goal when targeting that topic was to present a depiction of the *enveloppe* using current means in the form of a *reinterpretation*. Soon enough I realized that the best I can provide at this academic and experience level is *an approximation* to the features of this concept, through *filters*, three to be precise. First, Monet's own depiction of the concept through his Cathedrals, second, the lens of the camera that rendered these canvases into digital images, and third, the computer processing the retrieved data.

First and foremost, Monet's depiction with oil painting introduced to the notion of the *enveloppe* as a source of inspiration to the creative process behind his mastery. It also gave the hints to understand Impressionism as a revolutionary movement that questioned and redeemed the role of the painter, and the importance of own perceptions. The second filter, digital images, allowed me to enter the realm of the Cathedral series in the way photography does best, by capturing the visual representation of an instant. At last, the means which computes all inputs became in this process much more than a tool, and the chosen media to visualize the output became more than the devices that make it possible. In this last case, the decisions on the way the data was being processed came from my end and provided a much deeper understanding of the subject and its implications. Yet, it is imperative to emphasize that the presented prototypes are an early stage example of what a depiction of the notion of the *enveloppe* using current means could be like when further developed.

As source for future work in the field of immersive media, one of the legacies of Impressionism relies in notions that question the influence of perceptions in art, both from the artist as from the viewer. Throughout this academic work it has been possible to understand that these notions grow apart from the approach of object-centered art and moves towards *art as an experience*. The embracement of new media as an extended palette to the artist offers the possibility to address issues concerning the field of art since early on in history, in a novel viewer-centered way.

Standards of artistic work have never remained static. The challenge that supposes to work with new immersive media requires a holistic approach, due to the interdisciplinary nature of these. From a creative process that involves a technological development, it is necessary to build space in the head for the paradox of creating *embodied experiences* through *external devices*, to come closer to *human perceptions* through the *processing of data*. In the way the Impressionists embraced their time, new immersive media artists rely on the state-of-the-art technologies to bring a perspective that responds to their time, this time. On the meanwhile, I share the view that the best way to understand any subject is by depicting it, and this applies to any approach. Whether through analog or digital media, a visual depiction, as the great panorama artist states [Figure 54], conveys a deeper understanding of the subject, and, allow me to add, a deeper understanding of the artist.

Acknowledgement

Sources

Autodesk Inc. 2020. "Photogrammetry Software | Photos to 3D Scans | Autodesk." 2020. https://www.autodesk.com/solutions/photogrammetry-software.

Amory, Dita. 2004. "Georges Seurat (1859–1891) and Neo-Impressionism | Essay | Heilbrunn Timeline of Art History | The Metropolitan Museum of Art." The Met's Heilbrunn Timeline of Art History. October 2004. Accessed March 10, 2020. https://www.metmuseum.org/toah/hd/seni/hd_seni.htm.

Asisi, Yadegar. 2004. *Architekt der Illusionen.* Leipzig: Faber + Faber Verlag GmbH.

Auricchio, Laura. 2004. "Claude Monet (1840–1926) | Essay | Heilbrunn Timeline of Art History | The Metropolitan Museum of Art." The Met's Heilbrunn Timeline of Art History. Accessed November 6, 2019. https://www.metmuseum.org/toah/hd/cmon/hd_cmon.htm.

Autodesk Inc. 2020. "Photogrammetry Software | Photos to 3D Scans | Autodesk." 2020. https://www.autodesk.com/solutions/photogrammetry-software.

Baudelaire, Charles-Pierre. 2010. *The Painter of Modern Life.* Penguin UK.

Bernier, Ronald R. 2007. *Monument, Moment, and Memory: Monet's Cathedral in Fin de Siècle France.* Bucknell University Press.

Bimber, Oliver, and Ramesh Raskar. 2005. *Spatial Augmented Reality: Merging Real and Virtual Worlds*. CRC Press.

Bogdan Rusu, Radu, and Steve Cousins. 2011. "3D Is Here: Point Cloud Library (PCL)." In IEEE International Conference on Robotics and Automation. Shanghai. Accessed April 21, 2020. http://dx.doi.org/10.1109/ICRA.2011.5980567.

Boothby, Richard. 2015. *Freud as Philosopher: Metapsychology After Lacan*. Routledge.

Brock, Bazon. 2019. "A Panoramic View - How Yadegar Asisi Helps Us See Concepts Clearly." In *CAROLAS GARTEN: Eine Rückkehr Ins Paradies: 360°-Panorama von Yadegar Asisi*, 1st ed., 7–11. Cronenberg: Asisi F & E.

Callen, Anthea. 2000. *The Art of Impressionism: Painting Technique & the Making of Modernity.* Yale University Press.

Castagnary, Jules-Antoine. 1874. "Exposition Du Boulevard Des Capucines. Les Impressionnistes." 1–10. Paris: Le Siècle. https://fr.m.wikisource.org/wiki/Exposition_du_boulevard_des_Capucines._Les_impressionnistes.

Chang, Briankle G. 1999. "Deleuze, Monet, and Being Repetitive." Cultural Critique, no. 41: 184–217. Accessed March 18, 2020. https://doi.org/10.2307/1354525.

"Charles Philipon | French Caricaturist." n.d. In Encyclopedia Britannica. Accessed March

2, 2020. https://www.britannica.com/biography/Charles-Philipon.

Cline, Anna C. 2012. "The Evolving Role of the Exhibition and Its Impact on Art and Culture," 116.

Cruz-Neira, Carolina, Daniel J. Sandin, and Thomas A. DeFanti. 1993. "Surround-Screen Projection-Based Virtual Reality: The Design and Implementation of the CAVE." ACM Computer Graphics (SIGGRAPH) Proceedings. https://dl.acm.org/doi/pdf/10.1145/166117.166134.

Daniel, Malcolm. 2004. "Daguerre (1787–1851) and the Invention of Photography | Essay | Heilbrunn Timeline of Art History | The Metropolitan Museum of Art." The Met's Heilbrunn Timeline of Art History. Accessed March 3, 2020. https://www.metmuseum.org/toah/hd/dagu/hd_dagu.htm.

Daumier, Honoré. n.d. "Honoré Daumier | Le Charivari, December 1, 1832 - May 31, 1835 | The Met." The Metropolitan Museum of Art. Accessed March 2, 2020. https://www.metmuseum.org/art/collection/search/347359.

Davies, Char. 2004. "Virtual Space." In Space: In Science, Art and Society, 69–104. Cambridge University Press.

———. 1998. "Osmose: Notes on Being in Immersive Virtual Space (1995)." 1998. Accessed May 12, 2020. http://www.immersence.com/publications/char/1998-CD-Digital_Creativity.html.

De Botton, Alain. 2014. "David Hume." The Book of Life. November 7, 2014. Accessed November 12, 2020. https://www.theschooloflife.com/thebookoflife/david-hume/.

Debevec, P.E., C.J. Taylor, J. Malik, G. Levin, G. Borshukov, and Y. Yu. 1998. "Image-Based Modeling and Rendering of Architecture with Interactive Photogrammetry and View-Dependent Texture Mapping." In ISCAS '98. Proceedings of the 1998 IEEE International Symposium on Circuits and Systems (Cat. No.98CH36187), 5:514–17. Monterey, CA, USA: IEEE. https://doi.org/10.1109/ISCAS.1998.694545.

Deleuze, Gilles, and Tom Conley. 2006. *The Fold: Leibniz and the Baroque.* Continuum Impacts. London: Continuum.

Duret, Théodore (1838-1927) Auteur du texte. 1878. Les peintres impressionnistes : Claude Monet, Sisley, C. Pissaro, Renoir, Berthe Morisot / Théodore Duret ; avec un dessin de Renoir. https://gallica.bnf.fr/ark:/12148/bpt6k109139d.

F&A, Deutschland asisi. 2020. "Yadegar Asisi. Monet's Cathedral. 360° Panorama." January 2020. https://www.asisi.de/en/panorama/the-cathedral-of-monet/, https://www.asisi.de/en/panorama/the-cathedral-of-monet/.

Fowle, Frances. 2017. *Soil and Stone: "Impressionism, Urbanism, Environment".* Routledge.

Geffroy, Gustave. 1922. *Claude Monet, sa vie, son temps, son oeuvre.* Paris G. Grès.

Grau, Oliver. 2003. *Virtual Art: From Illusion to Immersion.* MIT Press.

Holt, Elizabeth Basye Gilmore. 1983. The Triumph of Art for the Public, 1785-1848: The Emerging Role of Exhibitions and Critics. Princeton, N.J.: Princeton University Press. https://catalog.hathitrust.org/Record/009500335.

House, John. 1986. Monet, Nature into Art. New Haven: Yale University Press. https://www.worldcat.org/title/monet-nature-into-art/oclc/15285012.

Hume, David. 1817. *A Treatise of Human Nature: Being an Attempt to Introduce the Experimental Method of Reasoning Into Moral Subjects.* Thomas and Joseph Allman.

"Impression, n." 2019. In Oxford English Dictionary Online. Oxford University Press. https://www.oed.com/view/Entry/92725.

Jones, Brett. 2012a. "What Is Projection Mapping?" Projection Mapping Central (blog). November 15, 2012. Accessed February 12, 2020a. http://projection-mapping.org/what-is-projection-mapping/.

———. 2012b. "The Illustrated History of Projection Mapping - Projection Mapping..." Projection Mapping Central (blog). December 20, 2012. Accessed February 12, 2020. Accessed February 12, 2020b. http://projection-mapping.org/the-history-of-projection-mapping/.

Lagerroth, Ulla Britta, Hans Lund, and Erik Hedling. 1997. *Interart Poetics: Essays on the Interrelations of the Arts and Media.* Rodopi.

Lappin, Joseph S. 2014. "What Is Binocular Disparity?" Frontiers in Psychology 5. Accessed May 2, 2020 https://doi.org/10.3389/fpsyg.2014.00870.

Leroy, Louis. 1874. "Exhibition of the Impressionists in Le Charivari, Orig. in French." Paris. Wikisource.

Lister, Martin, Jon Dovey, Seth Giddings, Iain Grant, and Kieran Kelly. 2009. New Media: A Critical Introduction. Taylor & Francis.

McLuhan, Marshall. 1994. *Understanding Media: The Extensions of Man.* New ed. Cambridge, Mass: MIT Press Ltd.

Monnerville, Gaston. 2002. "Georges Clemenceau | Prime Minister of France | Britannica." May 2002. Accessed January 27, 2020. https://www.britannica.com/biography/Georges-Clemenceau.

Moore, Stephanie A., Ulla Britta Lagerroth, Hans Lund, and Erik Hedling. 1997. *"Reviving the Medieval Model : The Cathedrals of Claude Monet, Joris-Karl Huysmans, and Claude Debussy." In Interart Poetics: Essays on the Interrelations of the Arts and Media.* Netherlands; United States: Rodopi.

Morris, William Edward, and Charlotte R. Brown. 2019. "David Hume." In The Stanford Encyclopedia of Philosophy, edited by Edward N. Zalta, Summer 2019. Metaphysics Research Lab, Stanford University. Accessed November 12, 2019. https://plato.stanford.edu/archives/sum2019/entries/hume/.

Muhanna, Muhanna A. 2015. "Virtual Reality and the CAVE: Taxonomy, Interaction Challenges and Research Directions." Journal of King Saud University - Computer and Information Sciences 27 (3): 344–61. https://doi.org/10.1016/j.jksuci.2014.03.023.

"Museums and Art in the Information Age." 2018. SMK – National Gallery of Denmark in Copenhagen (Statens Museum for Kunst). July 23, 2018. https://www.smk.dk/en/article/museums-and-art-in-the-information-age/.

Museyon. 2011. Art + Paris Impressionists & Post-Impressionists: The Ultimate Guide to Artists, Paintings and Places in Paris and Normandy. Museyon. https://books.google.de/books?id=vxVMBAAAQBA-J&printsec=frontcover#v=onepage&q&f=-false.

"Oculus Rift." 2020. In Wikipedia. https://en.wikipedia.org/w/index.php?title=Oculus_Rift&oldid=950612933.

"Oculus Rift | Oculus." n.d. Accessed May 6, 2020. https://www.oculus.com/rift/#oui-csl-rift-games=robo-recall.

"Oculus VR." 2020. In Wikipedia. https://en.wikipedia.org/w/index.php?title=Oculus_VR&oldid=955085613.

"Oliver Grau (2004). Immersion and Interaction: From Circular Frescoes to Interactive Image Spaces." n.d. Accessed May 2, 2020. http://www.immersence.com/publications/2004/2004-OGrau.html.

Pallasmaa, Juhani. 2005. *The Eyes of the Skin: Architecture and the Senses.* John Wiley & Sons.

"Particle - TouchDesigner Documentation." n.d. Accessed May 14, 2020. https://docs.derivative.ca/Particle.

"Particle System." 2020. In Wikipedia. https://

en.wikipedia.org/w/index.php?title=Particle_system&oldid=954128177.

Philipon, Charles. 1832. "Le Charivari." Heidelberg University Library: Le Charivari – Digitized. 1937 1832. http://charivari.uni-hd.de.

"Recherché, Adj." 2009. In Oxford English Dictionary Online. https://www.oed.com/view/Entry/159499?redirectedFrom=recherch%C3%A9#eid.

"Redefining Virtual Reality with Dr. Carolina Cruz-Neira." 2019. Dell Technologies. January 18, 2019. https://www.delltechnologies.com/en-us/perspectives/redefining-virtual-reality-with-dr-carolina-cruz-neira/.

"Reflection, Refraction, Projection « Ela Boyd." n.d. Accessed October 25, 2019. http://elaboyd.com/?p=371.

"Richard Thomson Interview about Monet and Architecture Exhibition." 2018. Yale University Press London Blog (blog). April 9, 2018. https://yalebooksblog.co.uk/2018/04/09/monet-and-architecture-an-interview-with-richard-thomson/.

Richman-Abdou, Kelly. 2017. "How Japanese Art Influenced and Inspired European Impressionist Artists." My Modern Met (blog). December 14, 2017. https://mymodernmet.com/japanese-art-impressionism-japonism/.

Riley, Charles A. 1995. Color Codes: Modern Theories of Color in Philosophy, Painting and Architecture, Literature, Music, and Psychology. UPNE.

"Rouen Cathedral, West Façade." n.d. Accessed March 7, 2020. https://www.nga.gov/collection/art-object-page.46524.html.

Rubin, James Henry. 1999. *Impressionism a & I.* Phaidon Press.

Sallis, John. 1998. *Shades--of Painting at the Limit.* Indiana University Press.

Samu, Margaret. 2004. "Impressionism: Art and Modernity | Essay | Heilbrunn Timeline of Art History | The Metropolitan Museum of Art." The Met's Heilbrunn Timeline of Art History. October 2004. https://www.metmuseum.org/toah/hd/imml/hd_imml.htm.

Schapiro, Meyer. 1997. Impressionism: Reflections and Perceptions. George Braziller. https://monoskop.org/images/d/db/Schapiro_Meyer_Impressionism_Reflections_and_Perceptions.pdf.

Schmitt, Daniel, Marine Thébault, and Ludovic Burczykowski. 2020. Image Beyond the Screen: Projection Mapping. John Wiley & Sons.

Seitz, William C. 1960. Claude Monet, Seasons and Moments. First Edition. New York: Museum of Modern Art.

Shanken, Edward A. 2002. "Art in the Information Age: Technology and Conceptual Art." Leonardo 35 (4): 433–38. https://doi.org/10.1162/002409402760181259.

Shiff, Richard. 1984. Cézanne and the End of Impressionism : A Study of the Theory, Technique, and Critical Evaluation of Modern Art. Chicago : University of Chicago Press. http://archive.org/details/cezanneendof00shif.

Silcox, Mark. 2018. A Defense of Simulated Experience: New Noble Lies. Routledge.

Simson, Otto Georg Von, and Otto von Simson. 1988. The Gothic Cathedral: Origins of Gothic Architecture and the Medieval Concept of Order - Expanded Edition. Princeton University Press.

Sketchfab. 2020. "Sketchfab - Publish & Find 3D Models Online." Sketchfab. 2020. https://sketchfab.com.

"Stereopsis, n." 1989. In Oxford English Dictionary Online. Oxford University Press. https://www.oed.com/view/Entry/189940.

Stuckey, Charles. 2007. "Stuckey, 'The Predications and Implications of Monet's Series'; from The Repeating Image." https://

www.academia.edu/30165778/Stuckey_The_Predications_and_Implications_of_Monets_Series_from_The_Repeating_Image_The_Walters_Art_Museum_2007.pdf.

TATE. n.d. "Neo-Impressionism – Art Term." Tate. Accessed March 10, 2020. https://www.tate.org.uk/art/art-terms/n/neo-impressionism.

"TouchDesigner." 2020. In Wikipedia. https://en.wikipedia.org/w/index.php?title=TouchDesigner&oldid=948827758.

Tucker, Paul Hayes. 1990. *Monet in the '90s: The Series Paintings.* Museum of Fine Arts, Boston and Yale University Press.

———. 1995. *Claude Monet: Life and Art.* Yale University Press.

Venturi, Lionello. 1968a. Les archives de l'impressionnisme : lettres de Renoir Monet, Pissarro, Sisley, et autres : Venturi, Lionello, 1885-1961. Vol. 2. 2 vols. New York: Burt Franklin. https://archive.org/details/lesarchivesdelim0002vent/page/n7/mode/2up.

———. 1968b. Les archives de l'impressionnisme : lettres de Renoir Monet, Pissarro, Sisley, et autres : Venturi, Lionello, 1885-1961. Vol. 1. 2 vols. New York: Burt Franklin. https://archive.org/details/lesarchivesdelim0001vent/page/346/mode/2up.

"What Does the Future of Painting Look Like?" 2014. Artnet News. October 31, 2014. https://news.artnet.com/market/what-does-the-future-of-painting-look-like-148893.

Wildenstein, Daniel. 1979. Claude Monet: Biographie et Catalogue Raisonne. Paris, 1979. Vol. 3, Peintures, 1887-1898. 1st ed. Vol. 3. 4 vols. Lausanne- Paris: La Bibliothèque des Arts. https://view.publitas.com/wildenstein-plattner-institute-ol46yv9z6qv6/c-r_claude_monet_tome_iii_wildenstein_institute_fr.

———. 1999. Monet, Or, The Triumph of Impressionism. Taschen. https://view.publitas.com/wildenstein-plattner-institute-ol46y-v9z6qv6/c-r_claude_monet_volume_i_wildenstein_institute-splitted/page/252-253.

Winchell, Kaleigh Paige. 2014. "From Instantaneities To The Eternal: Shifting Pictorial Temporalities In Monet's Rouen Cathedral." In .

Woletz, Julie. 2018. "Interfaces of Immersive Media." Interface Critique Journal 1. https://journals.ub.uni-heidelberg.de/index.php/ic/issue/view/3747/794.

Figures

---

that begins with terror". "Le Charivari (Paris. 1832) - 71 Jahre Verfügbar - Gallica." Accessed March 21, 2020. https://gallica.bnf.fr/ark:/12148/cb34452332k/date. 32

Figure 13. "Formerly refused, previously realist, ex-impressionist, intentionist, luminist, currently nihilist". "Le Charivari (Paris. 1832) - 71 Jahre Verfügbar - Gallica." Accessed March 21, 2020. https://gallica.bnf.fr/ark:/12148/cb34452332k/date. 32

Figure 14. Daguerreotype of Louis Daguerre by Jean-Baptiste Sabatier-Blot. "Daguerreotype." 2020. In Wikipedia. Accessed March 22, 2020. https://en.wikipedia.org/w/index.php?title=Daguerreotype&oldid=956163519. 33

Figure 15. Graphic representation of a daguerreotype. "Datei:Daguerreotipo.bw.jpg – Wikipedia." n.d. Accessed March 22, 2020. https://commons.wikimedia.org/wiki/File:Daguerreotipo.bw.jpg. 33

Figure 16. "Woman with a Parasol in a Garden", Painting by Pierre-Auguste Renoir. 1875. Oil on canvas. Gandalf's Gallery. https://www.flickr.com/photos/gandalfsgallery/37613322454/. 36

Figure 17. "Danseuse Basculant (Danseuse Verte)". Painting by Edgar Degas. 1877. Pastel and gouache on paper. Thyssen-Bornemisza Museum. https://commons.wikimedia.org/wiki/File:Edgar_Degas_-_Danseuse_basculant_(Danseuse_verte)_-_Google_Art_Project.jpg. 36

Figure 18. "Reading with Green Umbrella" Painting by Berthe Morisot. 1873. Oil on canvas. Cleveland Museum of Art. https://www.wikiart.org/en/berthe-morisot/reading-with-green-umbrella. 36

Figure 19. Renoir, Pierre-Auguste. 1868. La Grenouillère. Oil on canvas. Nationalmuseum, Stockholm. https://en.wikipedia.org/w/index.php?title=Pierre-Auguste_Renoir&oldid=955248482. 39

Figure 20. Macquart, Benoit. n.d. "La Grenouillère, partie I : Portrait d'une entrepreneuse."

Accessed May 21, 2020. https://maboucle.goodbarber.app/infoboucle/i/30147517/la-grenouillere-partie-i-portrait-dune-entrepreneuse. 40

Figure 21. "Bain à La Grenouillère". Painting by Claude Monet. 1869. Metropolitan Museum of Art. https://en.wikipedia.org/w/index.php?title=Bain_%C3%A0_la_Grenouill%C3%A8re&oldid=934998276. 41

Figure 22. Grainstacks paintings by Claude Monet. Oil on canvas. From upper left to lower right:

1. "Meules". 1890. 72,7 cm x 92,6 cm. Private collection. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_Meules_(W_1273).jpg.

2. "Grainstack (Sunset)". 1891. 73.3 cm x 92.7 cm. Museum of Fine Arts, Boston. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_Graystaks_I.JPG.

3. "Meules, Effet de Neige, Le Matin". 1891. 65.4 cm x 92.4 cm. Museum of Fine Arts, Boston. https://commons.wikimedia.org/wiki/File:Claude_Monet,_Haystack,_Morning_Snow_Effect_(Meule,_Effet_de_Neige,_le_Matin),_1891,_oil_on_canvas,_65_x_92_cm,_Museum_of_Fine_Arts,_Boston.jpg.

4. "White Frost. Sunrise". 1888. 65 cm 92 cm. Hill-Stead Museum. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_White_Frost,_Sunrise.JPG.

5. "Meules, Effet de Neige". 1890-91. 66 cm x 93 cm. Art Institute of Chicago. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_Stack_of_Wheat_(Snow_Effect,_Overcast_Day).jpg.

6. "Grainstacks, in Bright Sunlight". 1890. 58.4 x 96.5 cm. Hill-Stead Museum. https://commons.wikimedia.org/wiki/File:Monet_-_Grainstacks,_in_Bright_Sunlight,_1890.jpg.

7. "Grainstack, White Frost Effect". 1890-91. 65 × 100 cm. Shelburne Museum. https://commons.wikimedia.org/wiki/File:Monet_grainstacks-snow-effect-1891_W1274.jpg.

8. "Wheatstacks, Snow Effect, Morning". 1891. 64,8 cm x 99,7 cm. Getty Center. https://commons.wikimedia.org/wiki/File:Claude_Monet_(French_-_Wheatstacks,_Snow_Effect,_Morning_-_Google_Art_Project.jpg. 42

Figure 23. Photo by Renzo Dionigi, 2010. "Field of Oats with Poppies", Painting by Claude Monet. Oil on canvas. SPT - Musée d'Art Moderne de Strasbourg. Photo. https://www.flickr.com/photos/renzodionigi/4322749531/. 43

Figure 24. "Oat and Poppy Field, Giverny," Painting by Claude Monet. 1890. Oil on Canvas. Private Collection. Photograph Courtesy of The Athenaeum. https://commons.wikimedia.org/wiki/File:Oat_and_Poppy_Field_Giverny.jpeg. 43

Figure 25. "Rangée de Peupliers". Painting by Claude Monet. 1891. Private collection-institution. https://commons.wikimedia.org/wiki/File:Monet_Poplars-row-in-autumn_W1293.jpg. 44

Figure 26. "Numazu, Dusk" Printing by Utagawa Hiroshige in *Monet, Or, The Triumph of Impressionism*, 276. 44

Figure 27. "Rouen Cathedral, West Front" in *Normandy, its Gothic Architecture and History: as illustrated by twenty-five photographs from buildings in Rouen, Caen, Mantes, Bayeux, and Falaise. A sketch.'"* 1865. Accessed May 19, 2020. https://www.europeana.eu/de/item/9200387/BibliographicResource_3000117289808. 47

Figure 28. Cathedral Series paintings by Claude Monet. Oil on canvas. From upper left to lower right:

1. "Le portail temps gris", 1892. 100 cm x 65 cm. Musée d'Orsay. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_The_Cathedral_in_Rouen._The_portal,_Grey_Weather_-_Google_Art_Project.jpg.

2. "Le portail soleil", 1893. 100 cm x 65 cm. Private collection. https://commons.wikimedia.org/wiki/File:Rouen_Cathedral_Sunlight_W1322.jpg.

3. "Cathédrale de Rouen, symphonie en gris et rose", 1892-94. 100 cm x 65 cm. National Museum of Wales, Cardiff. https://commons.wikimedia.org/wiki/File:Rouen_Cathedral-_Setting_Sun,_Symphony_in_Grey_and_Pink.jpg.

4. "Le portail, soleil", 1892. 100 cm x 65 cm. National Gallery of Art, Washington. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_La_Cath%C3%A9drale_de_Rouen,_Le_Portail_au_Soleil.jpg.

5. "Le portail, soleil", 1894. 99.7 x 65.7 cm Metropolitan Museum of Art. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_Rouen_Cathedral_-_The_Portal_(Sunlight).jpg.

6. "La cathédrale de Rouen", 1894. Musée Pouchkine, Moscou. https://commons.wikimedia.org/wiki/File:%27The_Rouen_Cathedral_at_Sunset%27_by_Claude_Monet,_1894,_Pushkin_Museum.JPG.

7. "Louvet_Effet de soleil, fin de journée", 1894. 100 cm x 65 cm. Musée Marmottan. https://commons.wikimedia.org/wiki/File:-Claude_Monet_-_Rouen_Cathedral,_Facade_(Sunset).JPG.

8. "La Cathédrale de Rouen, soir", 1894. 100.4 cm x 65.4 cm. Pola Museum of Art. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_Rouen_Cathedral,_Facade_I.jpg.

9. "Louvet_Fin d_après-midi", 1893. Musée National de Serbie. https://commons.wikimedia.org/wiki/File:Rouen_Cathedrale_Monet_Belgrade_W1329.jpg.

10. "Le Portail et la tour d'Albane. Temps gris", 102 cm x 74 cm. 1894. Musée des Beaux-Arts de Rouen. https://commons.wikimedia.org/wiki/File:Monet-cathedrale-rouen.jpg.

11. "Le portail et la tour Saint-Romain, effet du matin harmonie blanche", 1894. 106 cm x 73 cm. Musée d Orsay. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_Cath%C3%A9drale_de_Rouen._Harmonie_blanche.jpg.

12. "Le Portail, effet du matin", 1894. 107 cm x 74 cm. Fondation Beyeler Bâle. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_Rouen_Cathedral,_Facade_and_Tour_d%27AlbaneI.JPG.

13. "Cathédrale de Rouen, façade et tour d_Albane, effet de matin", 1894. 106,1 cm x 73,9 cm. Museum of fine Arts, Boston. https://www.youtube.com/watch?v=KgfUWHM7zEo.

14. "La Cathédrale de Rouen dans le brouillard", 1894. Private collection. https://commons.wikimedia.org/wiki/File:Rouen-cathedral-fog_W1349.jpg.

15. "Cathédrale de Rouen, au soleil couchant", 1894. Musée Pouchkine. https://commons.wikimedia.org/wiki/File:Rouen-cathedral-fog_W1349.jpg.

16. "Cathédrale de Rouen, façade ouest", 1894. 100 cm x 65.9 cm. National Gallery of Art, Washington. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_Rouen_Cathedral,_West_Fa%C3%A7ade_-_Google_Art_Project.jpg.

17. "Le portail, brouillard matinal", 1892-1894. 101 cm x 66 cm. Folkwang Museum. https://commons.wikimedia.org/wiki/File:Claude_Monet_-_Rouen_Cathedral,_Facade_(Morning_effect).JPG.

18. "Portail effet de matin", 1894. Private collection. https://commons.wikimedia.org/wiki/File:Portail_effet_de_matin_W1353.jpg. 48

Figure 29. Viollet leDuc's study of the west front portal. In *Dictionnaire raisonné de l'architecture française du XIe au XVIe siècle, 1854-1868, tome 7.djvu/436* - Wikisource: https://commons.wikimedia.org/wiki/File:Rouen-cathedral-fog_W1349.jpg. 50

Figure 30. "La Façade de la cathédrale de Rouen au soleil" 1894. Painting by Claude Monet. Oil on canvas. 106.3 cm x 73.7 cm. Clark Art Institute. https://commons.wikimedia.org/wiki/File:Claude_Monet_La_cath%C3%A9drale_de_Rouen,_le_portail.jpg. 51

Figure 31. "Le portail, effet du matin" 1894. 100 cm x 65 cm. Painting by Claude Monet. Oil on canvas. J. Paul Getty Museum. https://commons.wikimedia.org/wiki/File:The_Portal_of_Rouen_Cathedral_in_Morning_Light,_oil_on_canvas_painting_by_Claude_Monet,_1894,_Getty_Center.JPG. 53

Figure 32. "Le Portail" 1894. Painting by Claude Monet. Oil on canvas. Staatliche Kunstsammlungen, Weimar. https://commons.wikimedia.org/wiki/File:Claude_Monet_Kathedrale_von_Rouen@20151002_01.JPG. 54

Figure 33. L'enveloppe, as the vibration of light around objects, as a tangible, unifying atmosphere. n.d. "Photo by Thomas Allsop on Unsplash." Accessed May 18, 2020. https://unsplash.com/photos/1bn02IO-VOAM. 56

Figure 34. Electric light represents a medium without a message. n.d. "Photo by Nadine Shaabana on Unsplash." Accessed May 18, 2020b. https://unsplash.com/photos/ZPP-zP8HYG0. 60

Figure 35. Holmes card viewer or Stereoscope, 1915. Stereoscopic anaglyph image by Koperczak. 2001. https://commons.wikimedia.org/wiki/File:Holmes_stereoscope_anaglyph_01.jpg. 62

Figure 37. Morton Heilig's Sensorama, 1956. USC Hugh M. Hefner Moving Image Archive. 2020. "Morton Heilig: Inventor VR." USC Hugh M. Hefner Moving Image Archive. 2020. http://uschefnerarchive.com. 62

Figure 36. Fred Waller's Cinerama, 1952. Photo by James Vaughans. 2010. Cinerama Lenses for Camera Rig. https://www.flickr.com/photos/x-ray_delta_one/5088008513/. 62

Figure 38. Ivan Sutherland's Head Mounted Display, 1968. "Figure 19, Le HMD d'Ivan Sutherland. © Photo by Ivan Sutherland." n.d. ResearchGate. Accessed May 18, 2020. https://www.researchgate.net/figure/Le-HMD-dIvan-Sutherland-C-Photo-courtesy-of-Ivan-Sutherland_fig19_261984085 62

Declaration of Authorship

———

I hereby declare in lieu of oath that this work, entitled: **"'L'enveloppe', of the depiction of impressions. Reinterpreting a concept of Impressionism through projection mapping and virtual reality prototypes"** has been independently written and that all directly or indirectly referenced sources have been properly cited. The work has not yet been submitted to any other examination board and has not yet been published in Germany or abroad.

Berlin, May 19th, 2020

Aixa Navas Valbuena
Nr. 118533

Impressum

―――――――――

'L'enveloppe',
of the depiction of impressions.
Reinterpreting a concept of Impressionism
through projection mapping and virtual
reality prototypes.