A Piece of Space

Exploring photographic space as a visualized form of spatial experience and thinking about how a designer can position it in reality.

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ABSTRACT

This project recognizes photographic space as a visualized form of spatial experience and tries to read unspecified spatial information in photos shared in social media. By exploring a photograph, I research how photography, which is a framing activity, has affected spatial experience and cognition. I try to re-build a space with photographs and compare the different characters of original space and photographic space by juxtaposition. The combination of original space and photographic space through a mechanism tool makes designers understand people’s experiential space over spatial hierarchy planned by designers.

The project shows three-dimensional space made with photos using a photogrammetry method. It places original space and photographic space within a tool that mechanized the principle of Filippo Brunelleschi’s linear perspective. It highlights the multiple identities of space and visual form of photographic space. Also, by applying Henri Lefebvre’s theory to two different spaces and spatial practices, it gives a clue how designers can understand a photograph as a social product of spatial identity, an independent element from real space.

A piece of space is an experiment spatial tool that draws people into multiple experienced spaces. It is tightly connected with spatial contexts; original space, photographic space and spatial practice by people. The whole process in the project consists of experiments that can explore the meaning of photographic space and how it can be positioned in reality.

Keywords: Photograph, Travel, Photogrammetry, Individual-Collective Identity, Experience Design, Spatial Experiment
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INTRODUCTION

Background and context

‘The fundamental event of the modern age is the conquest of the world as picture’¹
Many people travel to different places with the development of transportation, and mass-tourism has become a new cultural trend of spatial consumption. Technological culture makes people capture the moment of experience through an image. The image, fixed by a digital eye, flattens a space and projects space-time into two-dimension. This production separates the space from the actual space and causes the existential depth to be lost.

Aims and question/s

Susan Sontag argues that ‘the reality has come to seem more and more like what we are shown by cameras.’² It means that photography has become a material that affects the experience and perception of space beyond the meaning of replicas. Then how could we look at a photograph as a spatial component which is an independent element of original space? How can a designer get spatial information/identity in the photos over the visual information? What kind of meaning does a fragmented image contain? This project recognizes photographic space as a visualized form of spatial experience and tries to read unspecified spatial information in photos shared in social media. By exploring a photograph, I research how photography, which is a framing activity, has affected spatial experience and cognition. I try to re-build a space with photographs and compare the different characters of original space and photographic space by juxtaposition. The combination of original space and photographic space through a mechanism tool makes designers understand people’s experiential space over spatial hierarchy planned by designers.

2. Susan Sontag, On photography, p 7
Method

As a case study for the master’s thesis, I choose Stockholm Public Library, established 1928, which was designed by Gunnar Asplund. The architecture is one of the most notable structures in Stockholm, and it has touristic and public characters in the same area. First, I collect different kinds of materials including plan drawings and photographs that depict the space. After that, I change the two-dimensional materials to three-dimensional models. The plan drawing model is built with a 3D printing pen, and the photographic model is built with a photogrammetry method which is the way of reading spatial information through photographs. Second, I interpret the two models that are changed to three-dimensional forms with Henri Lefebvre’s theory; it is the production of space. The theory characterizes three modes of space production; representational space, representation of space and spatial practice. It provides the outline of how designers can look at a photograph as an independent spatial element resulting from social product. Lastly, a mechanical tool inspired by Filippo Brunelleschi’s linear perspective experiment merges the two different spaces into a frame and delivers the spatial experience to people. The tool creates space in between, photographic space and original space, and it shows the possibility of being able to read a space based on various experiences by unsepecific people, away from the existing designer-centered spatial analysis.
CONTEXT

Part 1: Original space vs Photographic space

Photography with spatial experience
memory and representation in the digital age

Figure 1
Eye Reflecting the Interior of the Theatre of Besancon, Engraving after Claude-Nicolas Ledoux. The theatre was built from 1775 to 1784.
‘Architecture has been regarded as an art form of the eye.’

Traveling space consists of pre-space, spatial experience, spatial memory, and space-sharing. Pre-space is an indirect space in which people get information before going on a trip. It usually happens on an online platform. Spatial experience is a moment that directly interacts with space and people, and it turns to spatial memory. And then, those experiences are shared with friends, family, or unspecified majority. Except the spatial experience, pre-space, spatial memory, and space-sharing are connected with images. Spatial memory is produced during the spatial experience and is visualized as a physical form, which is images. After that, it is uploaded on an online platform. This is an activity that shares personal experience, and it affects the spatial identity. These steps show that a photograph is one of the ways of consuming the space during the travel.

A photograph does not represent reality or originality of space. It is a relative and subjective tool. It is formulated differently depending on an individual’s experience and perspective and contains a selected area, form, color, view, and scenography in a singular rectangle frame. People use it as an entry point to dive into space and spatial experience. Furthermore, a photograph in an online platform is a spatial data from everybody – from the entire collective memory, visually, of what the Earth looks like – and link all of that together. It is not just a mimic of space but spatial information from the collective memory across the experience. So, reading a photograph means reading an experienced space and people’s selection of which part of space that will be erased or kept.

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4. I classify ‘pre-space, spatial experience, spatial memory, and space-sharing’ according to the way of spatial consumption. It was researched in London-Stockholm Traveling Period, 02-09.12.2019

5. Blaise Aguera y Arcas, 2007, How Photosynth can connect the world’s images, https://www.ted.com/talks/blaise_aguera_y_arcas_how_photosynth_can_connect_the_world_s_images, TedTalk
Photogrammetry
‘photos’ (light) and ‘grana’ (something written or drawn) and ‘metron’ (measure)

Photogrammetry is the art, science and technology of obtaining reliable information on the natural environment or physical objects through recording, measuring and interpreting photographic or produced by electromagnetic radiation and other phenomena.⁶

Mikaela Steby Stenfalk

Mikaela Steby Stenfalk is a visual designer, architect and curator from Sweden. One of her project ‘Collective collection: Mona Lisa’ is a visual communication work in collective memory of space. She uses photogrammetry methodology for making the collective memory of space and brings up the question from the project; What happens when the public gets to decide which art is the most important?⁷


When people see a space through social media, they might think that they know how it is to be present in the space physically. However, as the reconstruction shows, what they know is only fragments of the physical space captured by people.\textsuperscript{8} Photography turns people from passive spectators to a virtual storytellers, who curate their own space by the photographs. So, the photograph shared in social media has a meaning as a personal identity space, even if the photographs are about space.

Photogrammetry methodology helps me to re-build the space with photography. I randomly collected the Stockholm public library’s interior photos from social media. After that, the 100 photos are put in a computer program that can make the three-dimensional space with the photographs [Fig. 3].

\begin{figure}[h]
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\includegraphics[width=\textwidth]{fig3.png}
\caption{Different angles of photographic space made with 100 photographs of Stockholm public library using a photogrammetry methodology.}
\end{figure}

Photographs show the different perspectives of space by people’s experience. Photos have an individual identity. When I compose the space with several pictures, it turns to a collective identity of space. It is a fragmented space, unlike an original space, but highlights the view, which is an integral part of the space for people and how people keep the space in memory. Unselected parts of space are erased, and essential parts of experienced space are visualized into photographic space. Therefore, photographic space is a piece of the physical space that shows the collective perception of the original space.

\textsuperscript{8} Mikaela Steby Stenfalk, Collective Collection, http://mikaelastebystenfalk.com/collective-collection-mona-lisa.html, 2018
Figure 4
The shape of photographic space printed with 3D printer

Figure 5
The pattern of Stockholm public library made with 100 photographs. Photogrammetry methodology highlights the common area of the library that figured on social media.
Henri Lefebvre: The Production of Space

the meaning of real space and photographic space

In view of the example of spatial experience in social media, Henri Lefebvre’s philosophy on space as a social product suggests a direction how I could interpret photographic space, an independent element from real space. Henri Lefebvre is a French philosopher and sociologist. He throws a question on a congealed spatial understanding and argues that the concept of space is fragmented, and the domination of particular spatial views condones fragmentation of space. He perceives space as a result of social product, not as a physical and spontaneous object. Therefore, space is not just given a physical situation but accepted as a result of social behavior formulated based on the activities of people with a specific purpose. However, he says that space in modern society has been equipped with its consistent spatial production style in line with the production of modern society; space is ‘produced’ like a product in capitalism. People pursues spatial homogeneity like a product, and it turns to a tool for business. In ‘The production of Space’, he argues a space made with a social factor which affects spatial practices and perception, mainly focuses on the expansion of abstract space and commercialized space through the development of capitalism. This argument implies the shift of the research perspective from physical space to processes of its production; the embrace of the multiplicity of spaces that are socially produced and made productive in social practices; and the focus on the contradictory, conflictual, and, ultimately, political character of the processes of production of space.9

In the book, he contends that there are different modes of production of space [Fig. 6]. First is representations of space (le concu). It is conceptualized space by space expert, architect, or city planner who plan or create a concept of space. He called it a ‘conceived space’ or ‘ordered space’, which is regarded as predominant space. This is a physical space that exists itself with a single identity and is planned to look like mainstream. So it is melted in our daily life unconsciously, and we accept a rule and form without any doubt. Second mode is representational space (le vecu). This is a layered space with people’s moments and life. He called it a ‘lived space’. It is an experienced space with people’s feelings and senses outside of a scientific and theoretical approach. The space, which is the result of activities, can change the image, symbol, and ideal.

If representations of space is a result of space production defined and, conceptualized by an expert, representational space is a result of breaking a rule and form in the representations of space and highlights the independent practice by people. Moreover, these are made through spatial practices (le percu). Spatial practices make a contradiction between representations of space and representational space. And it brings a challenge to the governing rules in original space.

I apply the modes of space production within the two different materials: plan drawing and photograph [Fig. 7]. Representations of space is an original space that is already planned by someone, and it is depicted with a plan drawing. There is a single identity and no interaction with people. However, when people visit the place and start experiencing the space, which is called to spatial practices, space turns to representational space and it is visualized through a photograph. Representational space is a photographic space that is experienced, and it is created
as a photograph in the project.

Those concepts are also applied to the three-dimensional models which are made with plan drawings and photographs. One model, which is based on the plan drawings, has the feature of representations of space. The other, which is based on the photographs, has the feature of representational space [Fig. 8]. When I compare the two models, the model of plan drawings (original space) has a scale that followed the base material. Also, it keeps the shape of the original building but does not have a surface material. The model of photographs (photographic space) has surface material and is closer to two-dimensional space than the original space. The scale fades away from the space and it gains an abstract shape composed of fragmented photos. The most significant difference is that the original space has a single identity and invariable form because it was made from plan drawings. However, photographic space has a collective identity which is composed of different people’s experience and can be changed depending on the selected photographs.
Figure 8
Left: original space based on plan drawings, i.e. representations of space. Right: photographic space based on photographs, i.e. representational space.
Part 2: Development of mechanical tool

Filippo Brunelleschi

merging a three-dimensional and two-dimensional space

Historically, there were diverse efforts to capture a three-dimensional space to two-dimension- al images. Before developing the perspective, 14th century artists used light and shadow to express depth and volume for creating an illusion of space. Filippo Brunelleschi (1377-1446), an Italian architect and designer, re-discovered the linear perspective; the linear perspective system projected the illusion of depth onto a two-dimensional plane by use of ‘vanishing points’ to which all lines converged, at eye level, on the horizon. He systematically studied how and why objects, buildings, and landscapes changed and lines appeared to change shape when seen from a distance or different angles, and made drawings of the Baptistery in Florence, Place San Giovanni and other Florence landmarks in correct perspective.

10. Idea of perspective were known to ancient Greeks and Roman artists. Also, Arab scientist Alhazen (b.c 965 - d. 1040), *Book of Optics*, described his theory about the optical basis of perspective, *Filippo Brunelleschi Biography*, https://www.biography.com/artist/filippo-brunelleschi, 2014


*Figure 9*
Experiment of linear perspective
In his experiment, he used a mirror to draw and check the perfect perspective. He put a painting in front of his face toward the real space, and placed the mirror next to the painting. The mirror reflected the painting, and he checked the reflected image merging with real space at the same time [Fig. 9].

For my thesis project, I look through the emergence of perspective that helped to depict a three-dimensional space to a two-dimensional image. Even though it was a limited method to capture the experience of space, it shows how artists created a realism and representation of space in the past. Furthermore, I developed his linear perspective experiment to a new mechanism for placing an original space and photographic space at the same time. Instead of putting a painting in the experiment, I place the photographic space made with photos in front of the face toward the mirror [Fig.10]. In this way, I demonstrate that space does not only have one identity created by experts, but is also created by experience from various people. So, the mechanism will give a chance to understand the spatial production of multiple identities and create a new spatial scenery merged with photographic space and original space.
Figure 10
Drawing of new mechanism idea with real space and photographic space
Fragmented experience
PROCESS OF EXPERIMENTS

In this chapter, the experiments of the mechanism are explained for ‘A piece of space’.

First Experiment

In the first experiment, I made a mechanical tool based on Filippo Brunelleschi’s linear perspective experiment [Fig. 11]. This tool places original space (right)-mirror (middle)-photographic space (left)-person in a straight line. Each model is inserted in the gap, and a person gaze the mirror through the hole in the photographic space. The mirror’s movement helps to adjust the distance between the original space and photographic space, and the distance affects the scale of the reflected space in the mirror.

Figure 11
Mechanical tool based on Filippo Brunelleschi’s experiment
Second Experiment

In the second experiment, I tried to make a person as an active participant in the space. According to Brunelleschi’s principle, the order of placement was ‘original space - mirror - photographic space-person (as an observer)’. But in the project, it is changed to ‘mirror - photographic space - person (as an active participant)-original space’ [Fig. 13]. The mirror reflects photographic space, the person and original space at the same time, which is the moment of merging the two different spatial identities. So, the person who is watching the mirror can be within a new space which the mirror contains.
Figure 13
Order to mirror-photographic space-person (participant)-original space
Third Experiment

In the third experiment, the placement of photographic space and original space was arranged in more detail. The mirror, which is an area that captures a visual experience, was designed in a spatial context where the tool was installed at Stockholm Public Library [Fig. 15]. Unlike the second model, which was a fixed tool, the third model has mobility that can be installed everywhere, anytime.
The mirror was designed to move back and forth, which can control the distance. The movement of distance affects the area that the mirror can capture. Also, it can change the angle to a 360-degree revolution. This angle gives interaction between the person and the space. Even though the tool and person is placed in a place, the person can get the visual freedom from the angle’s movement. Therefore, the movement of mirror decides the size of experiencing space through the tool and turns the person into an active participant [Fig. 16].

The photographic space was printed by a 3D printer, which captures . The shape of the photographic space. And then, a printed surface pattern is attached to the shape. The person is located behind the photographic space and look at the mirror through a hole in the photographic space.

Figure 16
Movement of mechanism
Figure 17
Reflection test
‘When you enter a library, you can see the library surrounded by a lot of books. This is the real space. And there is something; the black mechanism tool is floating in the space. You wonder what this is. You hover around the installation and get into the tool. There is a hole that you can see. You follow the line and take your eyes close to the hole. The mirror reflects a space which is blending the photographic space and real space. You are watching the mirror with controlling the angle and distance, and you are in the new space framed by the mirror.

What are you looking at? Where are you? Is it space or not?’ [Fig. 18,19]
Figure 19
Framed space in the mirror
A piece of space is an experience design tool that merges an original space and photographic space within a frame through a mirror inspired by Filippo Brunelleschi’s experiment. The mechanical tool invites people to the space of multiple identities composed of people’s experiences. The space in the mirror is a visual space, but it interacts with the human body and physical movement. The movement of the body and tool decides the space that the person can see in the mirror. Therefore, ‘A piece of space’ creates a new space with multiple identities and draws the spatial practice between space and person.

In the project, a photographic space is a collective identity space composed of people’s moments. A photograph is a subjective and relative material that is formulated differently depending on an individual’s memory and perspective. It contains the experience of space made by an individual’s practice, while it breaks the physical hierarchy of space planned by a designer. So, the photograph is a fragmented space from a physical space and a medium for expressing the empirical selection of the space by people. When a photograph is united to space with the photogrammetry methodology, it turns from a two-dimensional plane to a three-dimensional space called a photographic space. This is an abstract and value-oriented space, separated from existing materials, scales, and forms. When photographic space is placed in the machine tool and combined with the original space, as Henri Lefebvre argued, the space gets multiple identities equally escaped from a prioritized space.
Figure 20
A piece of Space

Figure 21
Reflection of a framed space
Figure 22
Exhibition in spatial context
CONCLUSION

A piece of space is the project that explores the relationship between photograph and space. It observes a new way of spatial consumption through social media in modern society and points out photographs as a result of people’s spatial practice. In the project, there were three directions that I wanted to answer. First, what kind of meaning does fragmented space contain? The early stage of photography, it had meaning as a replication of the world. However, photography has become accessible to everyone with the development of technology; people have become creators making their own photographs. Nowadays, a photograph is a medium for recording and sharing every moment with others. The photograph has a regular shape. When they take a picture, they need to decide which part they will select and erase. It makes people choose the visual priority of space, so the photograph conveys what people consider important and less important elements in experiencing space.

Secondly, how can a designer get spatial information/identity in photographs over the surface? For this question, I used the photogrammetry method. Photogrammetry is a technology of obtaining reliable information by interpreting a material. I tried to make a three-dimensional space with a two-dimensional image over the surface. So, I put 100 photos to the program; the more pictures collected, the more detailed information you can get. The program filtered unnecessary information and highlighted the collective space that is selected by people. Through this process, I was able to get information about the spaces that an unspecified number of people consider important in one space and the spaces that they experience a lot. This space implies common empirical space, and suggests a direction to understand a photograph as a spatial component out of which a designer can create a new space.

Third, how could we look at a photograph as a spatial component, which is an independent element of original space? Photographic space is different from the original space. Then, what is different? Henri Lefebvre, a French philosopher and sociologist, argues that space has three
modes, not a single mode of space. He brings up space based on people’s moments. In this
project, I draw on his idea by creating a spatial experience between the photographic space and
the viewer through my mechanical tool. Space is a result of activity and social production, and
it overturns original space planned by an expert. A photographic space does not have an iden-
tity of original space, but it has a collectively subjectified experience and multiple identities
interpreted by people.

The mechanical tool suggests the way of merging a photographic space and original space
in the same space. It is an experiencing design tool that people can use. I got inspiration from
Filippo Brunelleschi’s experiment. It shows how two different spaces can exist together and
I changed the order of placement for making a person as a participant in the space. The tool
invites people into the space of multiple identities composed of people’s experiences.
The space in the mirror is a visual space, but it interacts with the human body and physical
movement. The movement of the body and tool decides the space that the person can see in the
mirror. Therefore, ‘A piece of space’ creates a new space with multiple identities and draws the
spatial practice between space and person.

The project does not talk about a space of traditional expression by designers. It tells how
photography, the most common and useful material in modern society, has changed the way
space is consumed. Accordingly, I explored how designers can accept the newly emersed form
of expression as a spatial component and what information they can read. It deviates from
an expert-centered perspective, suggesting a designer space as a social product through
photographs. I describe how empirical space can be expressed through visual materials, and
show that a new area can be created through photography. It also indicates the possibility that
space can be interpreted and understood through various experiences and unspecified views
with multiple identities.
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[Figure 22] The exhibition photo by Sanna Lindberg, 2020