

ARCHITECTURAL MODEL PHOTOGRAPHY:
A TOOL IN ARCHITECTURAL CULTURE

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY



BY
BALKIN ÇOKER BİLİCİ

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF ARCHITECTURE
IN
ARCHITECTURE

FEBRUARY 2020

Approval of the thesis:

**ARCHITECTURAL MODEL PHOTOGRAPHY:
A TOOL IN ARCHITECTURAL CULTURE**

submitted by **BALKIN ÇOKER BİLİCİ** in partial fulfillment of the requirements
for the degree of **Master of Arts in Architecture, Middle East Technical
University** by,

Prof. Dr. Halil Kalıpçılar
Dean, Graduate School of **Natural and Applied Sciences**

Prof. Dr. F. Candaş Bilisel
Head of the Department, **Architecture**

Assoc. Prof. Dr. M. Haluk Zelef
Supervisor, **Architecture, METU**

Examining Committee Members:

Prof. Dr. Ayşen Savaş Sargın
Architecture, METU

Assoc. Prof. Dr. M. Haluk Zelef
Architecture, METU

Asts. Prof. Dr. Selda Bancı
Architecture, TOBB ETU

Date: 01.02.2020



I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name : Balkın Çoker Bilici

Signature :

ABSTRACT

ARCHITECTURAL MODEL PHOTOGRAPHY: A TOOL IN ARCHITECTURAL CULTURE

Çoker Bilici, Balkın
Master of Architecture, Architecture
Supervisor : Assoc. Prof. Dr. M. Haluk Zelef

February 2020, 128 pages

Model photography has been practiced for a long time in the field of architecture; however, it has not been described as a different genre, and no specialized studies have been done on the subject until the 2010s. This thesis aims to show that model photography has filled a gap for the representation of architecture with its intrinsic features as a visual document and with its potential for different uses. The model has been used throughout the history of humankind, as a means of carrying information of different qualities, while it maintained its reference to physical reality and the human body. Under the influence of socio-cultural changes, not only the practice of architecture has been transformed, but also the main functions of the model have been differentiated. Photography had a transforming effect on the model's representational characteristics, functions, and its relationship with human beings. This thesis explores the features of model photography through essential developments in the history of this medium of representation. Then, it conveys the significant experiences of the actors who used model photography to design, experiment, document, and communicate in the field of architecture. The potential of model photography will be examined in the universal context, so the pioneering

cases of this medium will be presented. Finally, in order to develop the arguments, and in accordance with the findings of the thesis, the basic functions of model photography, and the effects of technological developments which are related with model photography, on the architectural practice will be discussed.

Keywords: Model Photography, Model, Architectural Photography, Architectural Culture.



ÖZ

MİMARİ MAKET FOTOĞRAFÇILIĞI: MİMARLIK KÜLTÜRÜNDE BİR ARAÇ

Çoker Bilici, Balkın
Yüksek Lisans, Mimarlık
Tez Yöneticisi: Doç. Dr. Mustafa Haluk Zelef

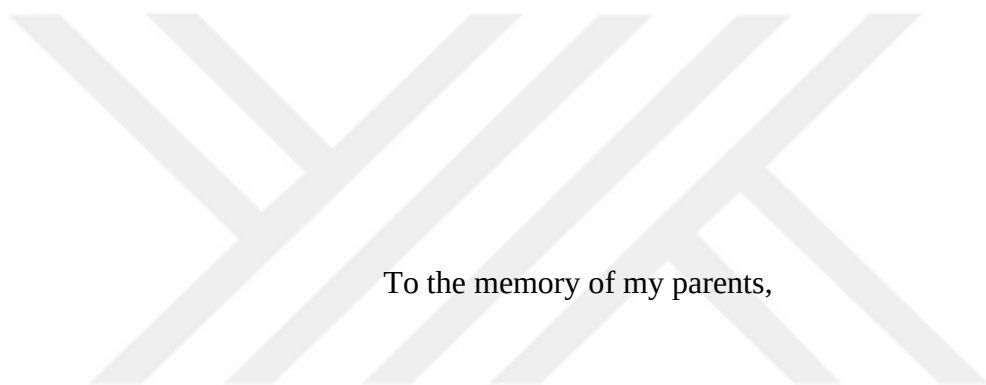
Şubat 2020, 128 sayfa

Maket fotoğrafçılığı mimarlık alanında uzunca bir süredir uygulanan bir pratik olmasına karşın, 2010'lu yıllara kadar farklı bir uzmanlık alanı olarak tanımlanmamış, üzerinde çalışmalar yapılmamıştır. Bu tez, maket fotoğrafçılığının hem görsel bir belge olarak özellikleri, hem de geniş kullanım potansiyeli ile mimarlık alanında bir boşluğu doldurduğunu göstermeyi amaçlamaktadır. Maket, insanlık tarihi boyunca fiziksel gerçekliği ve insan bedenini referans alan, farklı niteliklerde bilgi taşıyan bir araç olarak kullanılmıştır. Sosyo-kültürel değişimlerin etkisinde mimarlık pratiği dönüşüm geçirirken, maketin kullanım şekilleri de farklılaşmıştır. Fotoğraf, maketi temsiliyet özellikleri ve kullanım alanları, insan ile ilişkisi konularında dönüşüme uğratmıştır. Bu tez, bu dönüşümü incelemek için maket fotoğrafçılığı tarihindeki önemli gelişmeler üzerinden bu temsiliyet aracının kendine has özelliklerini incelemektedir. Ardından, mimarlık alanında tasarım, deney, belgeleme ve iletişim kurma amaçları doğrultusunda model fotoğrafını kullanan aktörlerin önemli deneyimlerini aktarmaktadır. Çalışmada maket fotoğrafının evrensel bağlamda olanakları incelenmektedir, bu nedenle bu yöntemlerin öncül örnekleri verilmektedir. Son olarak, tartışmaları ileri götürmek amacıyla, tezin bulguları doğrultusunda maket fotoğrafçılığın temel işlevleri ve

maket fotoğrafı ile ilgili teknolojik gelişmelerin mimarlık uygulamalarına olan etkileri ele alınacaktır.

Anahtar Kelimeler: Maket Fotoğrafçılığı, Maket, Mimari Fotoğrafçılık, Mimarlık Kültürü





To the memory of my parents,

ACKNOWLEDGMENTS

First and foremost, I wish to express my deepest gratitude to my supervisor, Assoc. Prof. Dr. M. Haluk Zelef for his valuable insight, advice, criticism, and encouragement throughout the research and writing of this thesis. This whole process has been one of pleasure for me thanks to his consistent and special support.

I would like to present my appreciation to my jury committee, Prof. Dr. Ayşen Savaş Sargın and Asts. Prof. Dr. Selda Bancı for their suggestions and comments. Ayşen Savaş Sargın introduced me to the field of architectural theory, and I will always be grateful for the intellectual stimulation she gave throughout my studies. I am as well much thankful to Selda Bancı for her valuable inputs and scholarly guidance.

I deeply appreciate Saliha Aslan for her stirring comments during the early stages of my study.

I have conducted interviews with reputable professionals from different fields and they were all rewarding and inspiring during my research. Unfortunately, I could not benefit from these interviews in full terms because of the change in the scope of my thesis. I would like to extend my gratitude to Gültekin Çizgen, Reha Günay, Necmettin Külâhçı, Selahattin Yazıcı, Pelin Derviş, Murat Küçük, Cüneyt Baykal, Çetin Ergand and Başak Özdoğan for their generosity in sharing their knowledge and warm hospitality.

Finally, I would like to thank my family and friends, Sema - Alp Çoker, Necla Bilici, Nilgün Saraçoğlu, Nermin Durusu, Özge – Recep Köse, Nazan – Erman Bakırcı, Hacer - Ozan Çetintaş, Gözde Yavaş, Aslı Arıkan and Zeynep Özsoy who contributed in different ways to the outcome of this study. I am, however, most indebted to my husband, Seçkin, for his financial and emotional assistance and unquestioned patience throughout my study. My son, Deniz deserves the biggest appreciation for the understanding he showed.

TABLE OF CONTENTS

ABSTRACT.....	v
ÖZ	vii
ACKNOWLEDGMENTS	x
TABLE OF CONTENTS.....	xi
LIST OF FIGURES	xiv
CHAPTERS:	
1 INTRODUCTION	1
1.1 Problem Definition and Purpose	1
1.2 Scope of the Subject.....	4
1.3 Structure of the Thesis.....	8
2 BACKGROUND OF MODEL PHOTOGRAPHY	11
2.1 Architecture	11
2.1.1 Architectural Theory on Representation	11
2.1.2 Works on Model Photography	16
2.2 Photography	22
2.2.1 The History and Theory of Photography	22
2.2.2 Conceptual Studies of Artists.....	23
3 MILESTONES IN THE HISTORY OF MODEL PHOTOGRAPHY	35
3.1 Before Photography.....	36
3.1.1 The Effects of Miniaturization.....	36

3.1.2	Representation of the Model	39
3.2	The Model and its Image After Photography	45
3.2.1	Reproducibility	47
3.2.2	Freezing the Moment.....	50
3.2.3	Abstraction	53
3.2.4	Objectivity vs. Fiction	57
3.3	Imitation of Architectural Photography	62
3.3.1	Photomontage	64
3.3.2	Simulation.....	66
3.4	The Model and its Image After Digital Technologies	70
3.4.1	Model's Virtual Space	71
3.4.2	Computer-Generated Images	74
4	SIGNIFICANT EXPERIENCES OF THE ACTORS IN MODEL PHOTOGRAPHY	77
4.1	Architect.....	79
4.1.1	Design of the Architect: Ludwig Mies van der Rohe.....	79
4.1.2	The experiment of the Architect: Antoni Gaudi.....	85
4.2	Artist	90
4.2.1	Plastic Arts: Medardo Rosso in Photography of Sculpture	90
4.2.2	Performing Arts: Metropolis and the Schüfftan Process	93
4.3	Scientist.....	97
4.3.1	The experiment of the Scientist: Sound Photography	97
4.4	Archivist.....	100
4.4.1	Documents in the School: Bauhaus	100

4.5	Media Expert	105
4.5.1	Publicity: 1939 New York World's Fair.....	106
5	CONCLUSION.....	111
5.1	Functions of Model Photography	111
5.2	The Effect of Photography on Model.....	114
5.3	The Effect of Digitalization on Model Photography	116
	REFERENCES	119



LIST OF FIGURES

FIGURES

Figure 1.1 Watson and Crick’s 3D Model of DNA, 1953.....	6
Figure 2.1 Installation view of “Modernism in Miniature: Points of View” curated by Davide Deriu, 2011.	19
Figure 2.2 Image from the Catalogue for the exhibition ‘Camera and Model.’ Image Courtesy of La Fábrica.	19
Figure 2.3 Model photo of Le Corbusier's Pavillon des Temps Nouveaux, Paris. Model: GSAPP students, photo: James Ewing.....	20
Figure 2.4 Installation view from the exhibition “Architectural Model Making in Turkey,” Photo: Sahir Uğur Eren (2017)	21
Figure 2.5 Thomas Demand, Kitchen (2004).....	28
Figure 2.6 Debris litters the kitchen used by Saddam Hussein before he was captured, Dec. 15, 2003. Credit: AP.....	29
Figure 2.7 James Casabere, Landscape with Houses 9, 2011	31
Figure 2.8 Oliver Barbieri, Site specific_ROMA 04 (Pantheon), 2004	32
Figure 3.1 Mosaics located over the south door in the vestibule. Hagia Sophia, İstanbul.	41
Figure 3.2 Left, Murillo Esteban Murillo Bartolome’s 1666 painting of St. Justa and St. Rufina, (Seville Museum of Fine Arts).....	42
Figure 3.3 Right, Philip Johnson holding his model on the cover page of Time magazine.....	42
Figure 3.4 Joseph Gandy (for John Soane), Various Designs for Public and Private Buildings: 1780-1815	44
Figure 3.5 Sir Denys Lasdun, Models, National Theatre, London, 1964-5.	44
Figure 3.6 Photomontage of Tatlin Tower and St. Petersburg, seminar.	47
Figure 3.7 Poster of Mosque Construction Association, Kocatepe Mosque model photograph. Architect: Vedat Dalokay	49
Figure 3.8 Study of light on model photographs. Architect: Steven Holl. Project: 51	

Figure 3.9 Left, Model photo example from the book, House X / Peter Eisenman	52
Figure 3.10 Right, Distorted model photo example from the book, House X / Peter Eisenman.....	52
Figure 3.11 Kasimir Malévitch, Alpha, Arkhitektons (1923).....	55
Figure 3.12 Model photograph of ‘House in concrete, iron, glass’ by Theo van Doesburg and C. Van Eesteren, Holland. (1923).....	56
Figure 3.13 Walter Gropius, Dessau, Anhalt. Office building and factory at the Werkbund exhibition, Cologne. Iron, Glass, Limestone.....	57
Figure 3.14 Balthazar Korab with TWA (Trans World Airlines Terminal) model. Architect: Eero Saarinen	61
Figure 3.15 Trans World Airlines Terminal, John F. Kennedy Airport, New York, 1956-62. Model. Architect: Eero Saarinen Photograph: Balthazar Korab	61
Figure 3.16 Kazimir Malevich, Architekton in Front of a Skyscraper, 1924	64
Figure 3.17 Photomontage of Minoru Yamasaki’s World Trade Center model and its site with adapted foreground, 1969.	66
Figure 3.18 A page from the book, <i>Umweltsimulation: Sensorische Simulation im Stadtebau</i> by Antero Markelin and Bernd Fahle, 131.	68
Figure 3.19 Photograph of an experiment in Coastal and Ocean Engineering Laboratory, Civil Engineering Department, METU.	69
Figure 4.1 Left, Model Glass Skyscraper, 1922. Photo: Curt Rehbein	81
Figure 4.2 Right, Friedrichstrasse Skyscraper Project, Berlin, 1922. Photograph of lost photomontage. Mies van der Rohe Archive. The Museum of Modern Art	81
Figure 4.3 Left, inverted photograph of the hanging model, depicting the interior of the church of the Colònia Güell.	89
Figure 4.4 Right, gouache drawings to show the interior space (Puig Boada 1976).	89
Figure 4.5 Left, Photograph of the Sculpture, The Concierge, Medardo Rosso, 1883.....	92
Figure 4.6 Right, Photograph by Medardo Rosso.....	92
Figure 4.7 Film Still from Metropolis. Photo by author.	94

Figure 4.8 Schematic rendering of a shot in the Moloch-sequence in Metropolis (Ufa, 1925/1926, dir. Fritz Lang), created by means of the Schüfftan process.....	95
Figure 4.9 Franz Max Osswald, sound test in a horizontal model of Gottfried Semper's Stadthaus Winterthur auditorium, 1933.	99
Figure 4.10 Bauhaus building Dessau, model, 1925 – 1926. Walter Gropius (Architect), Lucia Moholy (Photography (?))	103
Figure 4.11 Norman Bel Geddes' Futurama, New York World's Fair, 1939	107



CHAPTER 1

INTRODUCTION

1.1 Problem Definition and Purpose

Model making and photography have been used as tools of representation for a long time in the field of architecture. The earliest known remains of scale models, namely miniatures, date back to antiquity, and the camera, which is capable of recording images has been used for almost two centuries. Today architecture is considered to be more than its traditional object – the building. Architecture is a comprehensive discourse that allows rewriting architectural historiography through media.¹ The relations between architecture and scale model, architecture, and photography have been mainly investigated. Still, the encounter between these two media, architecture, and scale model photography, is proportionally a much less studied genre.

This thesis aims to particularly analyze this genre because whether professional or amateur, model photography, fills a gap for architectural representation in the 20th century. This medium has been among the essential tools that the architect uses to describe his/her built/unbuilt projects, such as drawings and architectural photographs. It differs from other visual representational media with its own characteristics. Architectural periodicals, monographs, exhibitions, and collections have embodied this type of image from the time it has proved its technical competence.

¹ Dana Arnold, Ergut and Özkaya. *Rethinking Architectural Historiography*. (Routledge, 2006)

Model photography is regarded as an independent field of expertise by scholars, like Davide Deriu and Inaki Bergera, who focused on model and architectural photography in the areas of architectural theory and history.² Still, this expertise is not regarded as an independent profession in practice. It is practiced professionally as a subtask by architectural and advertising photographers. On the other hand, many photography artists adopt model photography as the main business. All of these different works can be evaluated as parts of architectural culture.

The purpose of this work is to reveal the role of model photography in the context of architectural representations. Model photography can show how visualization methods, in this case, photography had transforming effects on modeling and how these images became an integral part of the architecture. Besides providing a different perspective for understanding models, model photography can be regarded as a unique tool in photography, as photography artists have already practiced it.

Model photographs arouse the feeling that they have common properties with digital model visualizations. This thesis aims to clarify the characteristic features of model photography and reveal its common features with other types of tools. The tools of visualizing architecture seem to become diversified with the help of technological developments, and choosing the visualization tools becomes an essential part of the architect's work process. Therefore, in-depth examination and categorization of such techniques can make them visible and understandable.

Model photography is used as a concept to unite the photographs of different types of models that are not designed and built for the function of human use but the representation of buildings and ideas. These photographs serve mainly for communication, so they bear information on different levels. The information that model photographs carry can be better comprehended when the social relations between models, photos, and people are analyzed beforehand. Therefore, it is aimed to investigate the social lifecycle of model photography regarding the functions of

² Their works will be explained in more detail, in the section, 2.1.2 Works on Model Photography.

model photographs in different contexts and periods, the structuring of social work and association, and the significance of model photographs in architectural culture.

As well as communication, model photography plays a role in writing the history of architectural culture. Models often have short life-span because their material is mostly not durable, and their active attendance in displays is relatively short. They find an opportunity to survive with the help of the camera, in secondary media such as analog/digital books, journals, archives. Projects in which the employer interferes with the original design and the student projects which never get the chance to be built can come to life in publications and archives in the form of photographs. Nowadays, digital archives enable architectural production to be recorded collectively and open them to the access of the interested parties. Model photographs have been collected as other images like drawings, architectural photos, and computer-generated renderings.

Therefore, this thesis aims to construct a framework for further studies of model photography and focuses on the strategies of people for the problems of representation, the context of the production process, and the effects of model photography as a practice on architecture. The re-reading of model photos through the parameters of photography, such as composition and style, is beyond the scope of this work. Further studies may include the categorization of model photos in digital archives, the history writing of models, and model photography.

It is assumed that the close relationship between photography and the model has had a modifying effect on two areas: the photograph and the model. Further, it can be proposed that recent representational media, such as virtual models and digital photography have been effected by model photography in the first place. After the advent of computer-generated images, it can be superficially assumed that the model photograph has lost its place, as it cannot compete with the computer in terms of efficiency. However, it will be discussed that this practice has not lost its potential for use, as physical modelmaking is still a necessary tool for the architect.

1.2 Scope of the Subject

The range of the model photography, which will be examined in this study, is going to be determined by its content: architectural models. Scale model photography is not limited to a sub-category of architectural photography, focusing on architectural models made by students or architects. The scope of the architectural model can be extended to all models belonging to architecturally related fields of design and engineering, such as city planning, interior design, stage design, civil engineering. According to this description, the 1/100000 scale model of a city, the 1/1 scale of stage decor, and the professional architectural model can be evaluated in the integrating concept of model photography.

In this study, models from different disciplines were evaluated to understand the nature of model photography. The models of architecture, interior design, and city planning are essential tools to produce, document, and convey architectural information; therefore, they are crucial for the profession of architecture. The models used for engineering experiments differ from architectural models as they do not represent the project as a whole but rather use relevant parts such as structural systems to test the design. This thesis considers these type of models are influential in the way that they offer different uses in model photography. The other types of models, such as the ones used in fine arts and popular culture, are influential in architectural culture. The stage design models and special effect miniatures used in films are used for the design of imaginary spaces. The photographs of sculptures and industrial design objects can even be evaluated under this term because the design process, which becomes available with the aid of photography, can have features common with other practices mentioned above. Finally, the photography of miniatures, toys, dioramas, souvenirs can be regarded as a similar method to see the represented spaces from a different perspective. The perception of these types of miniatures in images is different from their real-life experiences.

This study aims to analyze photographs of models from different disciplines; regarding that, modeling is a practice not limited to the history of design-based

professions. The disciplines of archeology and art history have been examining the model's use by the human, and it dates back to the ancient Egyptian and Greek civilizations.³ The preference of terms for these small objects changes in different disciplines. In natural sciences, models are built to visualize and concretize either too abstract issues or very small scale phenomenon unobservable with naked eye. In all these fields one can observe the use of different wordings.

The difference between the definitions of miniature and model can be unclear, so defining this difference can show how different results can be acquired through miniaturization. The etymological origin of the model comes from the Latin terms *Modulus* and *Modus* (pl.), and its meaning is "measure."⁴ The definition range of the word 'model' is more extensive than the miniature. "A three-dimensional representation of a person or thing or a proposed structure, typically on a smaller scale than the original," but also used as "a simplified description of a system or process, often mathematically, used to aid calculations and predictions, as well as an object to follow, replicate."⁵ Patrick Healy, who is a philosopher and writer, defines this term and gives clues about the similarities and differences between the physical model and conceptual model.

The notion of model could mean an actual physical model, that is, an artefact such that its parts, their relations and its working are suitably analogous to some other system. There was also the idea of a purely conceptual model, or what was called 'a merely' conceptual model, which was the envisaging or the specification in words of an artefact as described, without actually building it. Thus a verbal description of an actual physical model could be called a conceptual model.⁶

³ Albert C. Smith, *Architectural Models as Machine: A New View of Models from Antiquity to the Present Day* (Elsevier, 2004)

⁴ Origin of the word 'model', <https://www.etymonline.com/search?q=model>

⁵ Definition of the word 'model', <https://en.oxforddictionaries.com/definition/model>

⁶ Patrick Healy, *The Model and its Architecture* (010 Uitgeverij, 2013), 7.

Model is not only functional in architecture but also has been a useful tool in natural sciences and engineering disciplines. Among the vast physical visualizations that have been practiced, the DNA model⁷ is a significant example of physical modeling.⁸ In that period, biological macromolecules such as myoglobin and protein could be modeled with the information gained by tools like 'x-ray diffraction by crystals.⁹ These modeling methods were useful not only for experimenting but also for communicating the results of these works. In this thesis, the models representing architectural environments will be discussed; however, the tools of modeling and photographing are functional in a much broader context.

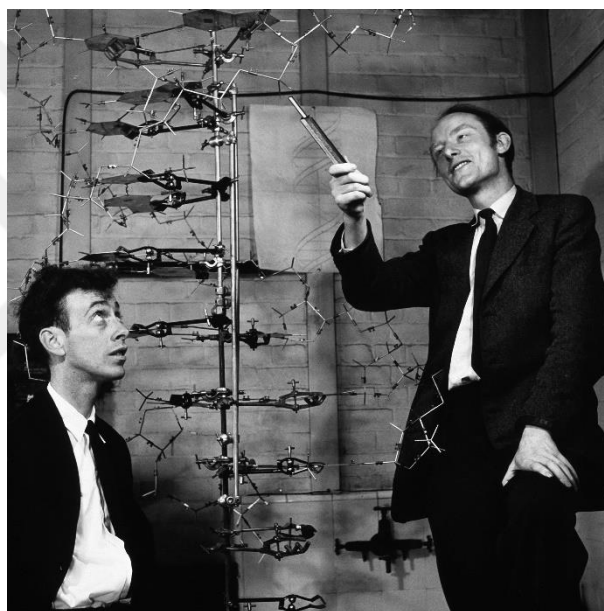


Figure 1.1 Watson and Crick's 3D Model of DNA, 1953.

Source: <http://dataphys.org/list/watson-and-cricks-3d-model-of-dna/>

⁷ “In 1953, James Watson and Francis Crick suggested what is now accepted as the first correct double-helix model of DNA structure in the journal *Nature*. Their double-helix, molecular model of DNA was then based on a single X-ray diffraction image taken by Rosalind Franklin and Raymond Gosling in May 1952, as well as the information that the DNA bases are paired.” Source: <https://www.history.com/this-day-in-history/watson-and-crick-discover-chemical-structure-of-dna> [Last Access on 26.02.2020]

⁸ Haluk Zelef, thesis discussion.

⁹ Eric Martz and Eric Francoeur, “History of Visualization of Biological Macromolecules”, <http://www.umass.edu/microbio/rasmol/history.htm> [Last access on 26.02.2020]

Miniature generally means “a thing that is much smaller than normal, especially a small replica or model.”¹⁰ The etymological origin of miniature comes from the “1580s, ‘a reduced image, anything represented on a greatly reduced scale,’ from Italian ‘Miniatura,’ which means “manuscript illumination or small picture.”¹¹ The word is said to be affected by “the similar-sounding Latin words that express smallness: minor, minimus, minutus.”

In general, the small-scale copies of things are called miniature in the popular culture, such as souvenirs, personal collection items, the objects of display in museums, and national parks. The model belongs to the area of professional practices. Douglass Bailey, who is a professor in anthropology, says that people use models for precision and authenticity. He adds that the architectural model is the perfect example because these models are mostly teaching tools, prototypes for testing, guides for construction, tools for the persuasion of the clients.¹² These functions require the model to be accurate; otherwise, it will cause misinformation. Bailey continues that, the miniature does not seek for accuracy, it aims to represent reality through the processes of selection and abstraction. The perfect examples he gives for miniature are bonsai and penjing (ancient Chinese art of depicting artistically formed trees, other plants, and landscapes in miniature). The author adds that miniature is the product of the physical realization of abstract ideas, so it becomes a tool to think the unthinkable.

Concerning the differentiation that Bailey makes, not all architectural models can be identified merely as models. The level of manipulation and abstraction applied to the model can turn it into a miniature or a sculpture. Moreover, it is better assumed that most of the models can bear properties both from purely defined models and miniature at the same time.

¹⁰ Definition of the word ‘miniature’, <https://www.lexico.com/definition/miniature>

¹¹ Origin of the word ‘miniature’, <https://www.etymonline.com/search?q=miniature>

¹² Douglass W. Bailey, *Prehistoric Figurines: Representation and Corporeality in the Neolithic* (London: Routledge, 2005), 29

This thesis aims to analyze model photography in a broad context and reveal the characteristics of the medium. Writing the history of model photography is beyond the scope of this thesis. Instead, cases from different countries and different periods were used to illustrate the related concepts. The chapter on the experiences of the actors, uses more complicated cases of model photography experienced between the 1910s-1950s as they show the initial experimentations of this particular tool. The fact that many of the cases are not limited in terms of location and time can be seen as a negative situation for the study. Still, this thesis aims to comprehend model photography from an upper scale with its prominent features as it has been previously done in aerial and panorama photography, and similar studies.

1.3 Structure of the Thesis

The first chapter summarizes the purpose, scope, and structure of the study. The second chapter will reveal the background of model photography. This section is divided into two subchapters: the first subchapter covers the studies on model photography in the field of architecture; the second subchapter examines how this practice takes place in architectural and artistic photography. Since the model photography is aimed to be examined as an architectural tool for representation, firstly, (2.1.1), the literature that has influenced this study will be summarized. Then, the context in which the model photo takes place will be explored (2.1.2), especially the range of related books and exhibitions will be examined (2.1.3). In the second subchapter, firstly, the literature in the field of photography will be briefly analyzed (2.2.1), and the contributions of professional artists interested in model photography will be reviewed (2.2.2).

The third chapter will investigate the characteristics of the model photograph to understand the nature of this representational system through the milestones of significant technological developments. In the first subchapter (3.1), the nature of the model before the advent of photography will be analyzed. The motivation for the use of models and miniatures in social and professional life will be summarized, and

then the early representations of models will be researched. In the second subchapter (3.2), the effects of photography on the image of the model will be evaluated through concepts that have been used to explain the characteristics of photography. Model photography is a representation of a representation, in another saying, a meta-representation¹³; therefore, its position with reference to reality is unique. Its qualities, among other representational systems, will be discussed in this part. In the third subchapter (3.3), it is aimed to emphasize the trend for manipulating model photographs to imitate architectural photographs with the cases of modelscope, photomontage, and analog simulation. In the fourth subchapter, (3.4), it is aimed to detect the changes in model photography caused by digitalization, which was accelerated with the introduction of personal computers. New techniques of digital photography and digital modelmaking had an impact on the current understanding of representation and traditional social relations in architectural practice inevitably.

In the fourth chapter of the thesis, it is aimed to cover the experience of model photography from the perspectives of different actors. The cases were chosen from well-known examples, and their expertise will be narrated from the viewpoint of the actors in detail. These actors belong to different disciplines such as art, architecture, and engineering, still similar patterns of use in model photography will be searched. The final chapter will review the findings of the thesis. The different roles of model photography for the problems of design-thinking, experimenting, documenting, and communicating will be revealed through the experiences of the actors in model photography.

¹³ This term was defined by Inaki Bergera. in *Modelling for the Camera: Photography of Architectural Models in Spain 1925-1970*. (2016)

CHAPTER 2

BACKGROUND OF MODEL PHOTOGRAPHY

2.1 Architecture

In recent years, there has been a growing literature addressing the issue of architectural productions in different forms of representation. As Adrian Forty had put it, architecture has become a cultural production that does not limit itself to specific buildings but also includes their representations, their mass mediation in society, and everything that has been said and written about them over time.¹⁴ These studies have revealed that representational tools have had a profound effect on architectural culture. This thesis has been deeply influenced by the vast literature on architectural representations, which will be reviewed in the following paragraphs.

2.1.1 Architectural Theory on Representation

An early example of the inclination of architectural theory towards culture studies, is the anthology of Joan Ockman, *Architecture Culture: 1943-1968* (1990). It is a collection of international documents accompanied by the critical contextual writing of Ockman.¹⁵ The text began to be regarded as an essential part of architectural history. Since then, architectural text, drawing, photography, and model have been the subject of scholars' investigations in architecture, as they have produced a vast

¹⁴ Adrian Forty, *Words and Buildings: A Vocabulary of Modern Architecture*, (London: Thames and Hudson, 2000)

¹⁵ At that time, she was a scholar at Columbia University, where scholars were committed to documenting the architecture of the 20th century.

literature on the subject. In this chapter, significant studies about photography's role in architecture will be mentioned briefly in chronological order.

The effect of photography on architecture must be analyzed through its being a medium for reproduction at first hand. The word "reproduction" refers to the production of many identical copies by machine and the process of mass production applied through photography, print technology, and electronic recording. A prominent author for the literature dealing with the reproducibility feature of photography in architectural theory is Beatriz Colomina. In *Architectureproduction* (1988), she describes the ways modernist architecture is 'constructed' in mass media¹⁶. The tools of the period naturally served for the dynamics of capitalism: "With photography, the illustrated magazine, and tourism, architecture's reception began to occur also through an additional social form: consumption."¹⁷

Jonathan Crary in *Techniques of the Observer* (1992), clearly states that the significant influence of photography lies in its feature of reproducibility: "To understand the 'photographic effect' in the nineteenth century, one must see it is a crucial component of a new cultural economy of value and exchange, not as part of a continuous history of visual representation."¹⁸

Colomina described Le Corbusier as a master using media to build his *Oeuvre complète*. In an article about the architect, she says that Le Corbusier witnessed "the passage from an industrial to a consumer society, with the corresponding development of mass media and publicity and the formation of a 'culture of consumption'"¹⁹ so that he was fully aware of the importance of documenting and

¹⁶ Beatriz Colomina, *Privacy and Publicity: Modern Architecture as Mass Media*, (The MIT Press, 1996)

¹⁷ Ibid. p.9.

¹⁸ Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (October Books. Cambridge: MIT Press, 1990), 38-9

¹⁹ Beatriz Colomina, "Le Corbusier and the Everyday Image of the Industrial Age" in Michael Hays, (ed.) *Architecture Theory Since 1968* (The MIT Press, 2000), 627.

advertising his work. At the end of *Architectureproduction*, Colomina emphasizes that the history of architectural media is equally necessary to be written because “they invent ‘movements,’ create ‘tendencies,’ and launch international figures”²⁰ for writing the history of architecture.

The book of Diana Agrest, *Architecture from Without: Theoretical Framing for a Critical Practice* (1991), is remarkable in the way that she associates architecture and other visual discourses. The following book of Beatriz Colomina, *Privacy, and Publicity: Modern Architecture as Mass Media* (1994) is also a comprehensive work dealing with the concepts of city, archive, war, advertisement, and museum. She emphasizes that the new contexts of architectural production in modernism led to a change in the experience of architecture because the relationship between the private and the public was reinvented in this period.

The collection of essays, *This is Not Architecture: Media Constructions* (2002) edited by Kester Rattenbury, is also a significant work to discuss the characteristics, cultures, limitations, and biases of the different kinds of media. The book aims to analyze how the constructions of media and the forms of representation affect or enhance the conceptualization of architecture.²¹ Rattenbury describes the four shifts in representation as to the advent of perspective, photography, film, and e-technology. The book analyzes the history and characteristics of these media and their effect on people’s interpretation of architectural subjects.²² In *Zoomscape: Architecture in Motion and Media* (2004), architectural historian Mitchell Schwarzer calls the new mediated architectural experience the “zoomscape.” An anonymous review which was written for the publicity of the book clearly summarizes the aim

²⁰ Beatriz Colomina. Colomina, co-ed. “Introduction: On Architecture, Production and Reproduction,” in Joan Ockman (ed.), *Architectureproduction* (New York: Princeton Architectural Press, 1998), p.66.

²¹ Kester Rattenbury, “Introduction” in *This is not Architecture, Media Constructions* (Routledge, 2002)

²² Ibid, xxiii

of Schwarzer: “He argues that the perception of architecture has been fundamentally altered by the technologies of transportation and the camera- we now look at buildings, neighborhoods, cities, and even entire continents as we ride in trains, cars, and planes, and as we view photographs, movies, and television.”²³ During the last two decades, rewriting the history of architecture through the works of representation (model and photography in this case) has been densely diversified.²⁴

For the case of Turkey, Uğur Tanyeli’s work, *Türkiye’nin Görsellik Tarihine Giriş* (2009) / [Introduction to the History of Visuality in Turkey] provides an introduction to the issue of visualization in the country. Tanyeli investigates the reproduction of physical environment through tools of visualization and the connections between visualization techniques, forms, and other social practices such as street photography in İstanbul and travel sketches of famous architects.²⁵

Photography, as a representational medium in architecture, has been investigated through academic studies in Turkey. The earliest studies were A. N. Topçuoğlu’s “Photographic Representations of Environments and Their Use in Architectural Education: A Study in Fidelity and Univocality” (1978) and T. Şekercioğlu’s “Photography in Architectural Periodicals: Formulating a Typology for the Use of a Single Photographic Image per Building” (Graphic Design, 1993). Significant Ph.D., theses about this topic have been: B. Uluengin, “Mimari tasarlama sürecinde fotoğraf

²³ <https://www.amazon.com/Zoomscape-Architecture-Motion-Mitchell-Schwarzer/dp/1568984413>. [accessed on 23.10.2019]

²⁴ Some of them are: Karen Moon, *Modeling Messages*, (New York: The Monacelli Press, 2005); Andrew Higgott, Timothy Wray (eds), *Camera Constructs: Photography, Architecture and the Modern City*, (Ashgate, 2012); Peter Cachola Schmal And Oliver Elser (eds.), *The Architectural Model: Tool, Fetish, Small Utopia* (Scheidegger and Spiess, 2012); Claire Zimmerman, *Photographic Architecture in the Twentieth Century* (University of Minnesota Press, 2014); Graham Cairns, *Visioning Technologies: The Architectures of Sight* (Routledge); Thea Brejzek, Lawrence Wallen, *The Model as Performance: Staging Space in Theatre and Architecture* (Methuen Drama, 2017); Teresa Fankhänel, *The Miniature Boom: A History of American Architectural Models in the Twentieth Century* (Park Books, 2018); Matthew Mindrup, *The Architectural Model: Histories of the Miniature and the Prototype, the Exemplar and the Muse* (MIT Press: Cambridge, 2019). These books look back to the history of the representation of architecture from different perspectives

²⁵ Uğur Tanyeli and Ali Taptık, *Türkiye’nin Görsellik Tarihine Giriş* (Akın Nalça Kitapları, 2009).

tekniklerinden yararlanma yöntemleri,” [Methods for using photographic techniques in architectural design] (1996) and B. Kütükçüoğlu, “Ideal framing: Photographic representation of the modern villa” (2012).²⁶ However, the academic studies about models in Turkey are less in number.²⁷

Some of the studies are unstraightforwardly related to the thesis in their scope as they focus on the context of Turkey. These theses are F. A. Taptık, “19th Century Photographs of Istanbul: Representation of City and Architecture in the Gift Albums of Abdulhamid II” (2011); Ç. Ercanlı, “The Relationship between Architecture, Ideology and Photography in the Early Turkish Republican Period: Covers of Arkitekts” (2015); S. Acar, *Capturing Constantinople: Travel Albums (1884-1910)* (Ph.D.- 2015)²⁸ and S. Bancı, *Printed Architectures: Architects’ Auto-Monographs in Turkey, 1950s-1980s* (Ph.D.- 2016)²⁹. These studies are remarkable for investigating architectural culture through representational media with the main motive of unique, localized research in Turkey.

²⁶ M.Arch theses written about the medium of photography in 2000-2010s are: G. Savaşır “Re-framing Architecture: METU Faculty of Architecture and its Photographic Reproductions” (2001); A. Koca, “Authentication of space: The Photograph as a Raw Material for Architectural Production” (2009); E. Coşkun, “Documentation of Architecture: Photography as an Objective Tool?” (2009); E. Yıldırım, “Photo-space, Photo-story, Photo-wall: Architecture of Le Corbusier and its Photographic Representation” (2009); M. Apan, “Photography in terms of Impression and Visual Perception” (2011); M. Akyol, “Photograph as an Architectural Document: A Visual Archive for METU Campus” (2012); B. Gür, “Panorama as a Representation Form for City Image: Panoramic Istanbul,” (2017); H. Bozkurt, “A Hybrid Method for Evaluating Architectural Photography Types” (2019), A. İbrikçi, “Cogitative Photograph as a Visual Thinking Tool in Architecture” (2019).

²⁷ The list is given in chronological order: E. Osmanoğlu, “An Architectural Study on Miniature Parks and Miniature Models: Miniaturk” (2005); A. Arpak, “Physical and Virtual: Transformation of the Architectural Model” (2008); H. A. A. Hadia, “Model Making as a Value-added Tool in Public, Educational and Professional Domains” (Ph.D.-2015); Ç. Özbaki, “Design Thinking via Model Making: Physical versus Digital Media.” (Ph.D.- 2016); Ö. F. Tekin, “Approaching Drawings and Physical Models in Design Process through Acts which Multiply Productions” (2016).

²⁸ Acar’s thesis examines “six travel albums of Istanbul produced between 1884 and 1910, held in Pierre de Gigord’s collection of photographs of the Ottoman Empire and the Republic of Turkey at the Getty Research Institute Library in Los Angeles. Sibel Acar, (From the abstract of the thesis)

²⁹ Bancı’s thesis investigates “architecture in Turkey from the 1950s to the 1980s through printed mediums and focuses on the auto-monographs prepared by practicing architects, one of the genres of printed mediums in architecture.” (From the abstract of the thesis)

2.1.2 Works on Model Photography

It is noteworthy that the model photography has not been studied as the leading concept in a thesis. The study of model photography in the field of architectural theory has been conducted in the 2010s. Articles that are written by Inaki Bergera, Davide Deriu, and Mark Morris mention that it is an under-researched topic despite its potential. In this section, works about model photography will be examined in chronological order.

There has been considerable dissemination of model photography in architectural culture. It took part in the portfolios of architectural photographers specializing in this genre, in the chapters of theses and books examining the technics, history, and theory of the modern model and architectural photography, monographs that present the experiences of professional architects in general, and the publications promoting architecture. Nowadays, with the increase of available resources, it is possible to read architectural culture and history through the practices of different actors.

Model photography was filling one chapter in many technical books about architectural photography and model. Besides being technical in scope, these works define model photography as a professional practice.³⁰ An early theoretical investigation on model photography appears on Karen Moon's *Modeling Messages* (2005)³¹. It is a very comprehensive work on the theory of architectural models. It includes both the historical and the contemporary works of models with lots of model photographs. It gives information about model photography as practiced in the 19th and 20th centuries.

³⁰ Some of these works are Joachim Giebelhausen's *Architekturfotografie* [Architectural Photography] (1964), Rolf Janke's *Architekturmodelle* [Architectural Model] (1968), Antero Markelin and Bernd Fahle's *Umweltsimulation: Sensorische Simulation im Stadtebau* [Environmental simulation: sensory stimulation in urban planning] (1979), Wolfgang Knoll, and Martin Hechinger's *Architectural Models: Construction Techniques* (1992), Gregg D. Ander's *Daylighting Performance and Design* (1995).³⁰

³¹ Karen Moon, *Modeling Messages*, (New York: The Monacelli Press, 2005).

Davide Deriu and Inaki Bergera have written pioneering articles about the theory of model photography. Deriu has focused on the practice of model photography in Modern Architecture. Deriu's works are mostly based on the intersection of architectural history and visual culture.³² Bergera is involved in the research for the history of architectural photography, especially in Spain. Both of the author's works were accompanied by exhibitions, and they will be further explained in the section "Model Photography on Display."

The book titled *The Architectural Model: Tool, Fetish, Small Utopia* (2012) was published after an exhibition with the same title, curated by Oliver Elser and organized by The Deutsches Architekturmuseum (DAM). The book includes articles about brief histories of model and model photography, as well as other significant works in the exhibition. The article, "A Short History of Model Photography" mentions significant cases of model photography, mostly from Germany.

The definition of model photography has recently been seen in exhibitions and digital archives. As a keyword, it provides access to a diverse archive of digital sources. The archives of well-known American architectural photographers Ezra Stoller, Julius Shulman, and Balthazar Korab had been digitalized partially, and they include a vast number of model photographs.³³ Institutions such as the Library of Congress and Getty Research Institute have taken the initiative for collecting relevant documents in architectural culture.

Model photography also recently became an issue in the architectural agenda in Turkey. There is a project of SALT³⁴, going on for the documentation of the model

³² I have taken his course, which is, "Picturing the Modern City: Visions, Representations, Imaginations" in METU, Master's programme in 2006-2007.

³³ Ezra Stoller: <https://www.estock.com/>, Julius Shulman: http://www.getty.edu/research/tools/guides_bibliographies/shulman/index.html and Balthazar Korab: <https://www.loc.gov/collections/korab/about-this-collection/>

³⁴ SALT is a non-profit institution that carries out cultural activities within Garanti Bankası in Turkey.

photographs of Selahattin Yazıcı, a professional modelmaker who worked for the significant architects of Turkey between the 1960s and 80s, with the help of scholars from METU.³⁵ Yazıcı's collection naturally constitutes a comprehensive and diversified archive for the architecture of that era.

2.1.2.1 Model Photography on Display

Model photography is the subject of attention in exhibitions held in the 21st century. The exhibitions dedicated to models became more frequent after the 1970s, with a few exhibits dating back to 1941 and 1965.³⁶ Before that, they were only used to help illustrate projects along with other forms of architectural representations. This situation is almost the same for the model photograph. It used to have a subsidiary role in illustrating projects before it became the center of attention alone. In the 2010s, the exhibitions, which saw model photography as an adequate representation/publication tool, especially in the researches about modernism, began to take place in different countries.

There are at least three significant exhibitions about model photography. The exhibition called "Modernism in Miniature: Points of View" was curated by Davide Deriu, and held at CCA (Canadian Centre for Architecture) between 22.09.2011-08.01.2012. (Figure 2.1) It proposes a specific link with "the so-called 'model boom' and the explosion of mass media between 1920 -1960, when miniatures reached out to a broad public and, in some cases, acquired a cult status."³⁷

³⁵ <https://www.studio-xistanbul.org/tr/events/meraklisina-tasarim-tarihimiz-kutuphane-bulusmalari-6> [accessed on 23.10.2019]

³⁶ Karen Moon, *Modeling Messages*, (New York: The Monacelli Press, 2005), 39, 48.

These exhibitions are: name unknown, (Oxford, England, 1941); John Witon-Ely, "The Architect's Vision" (University of Nottingham; England, 1965); "Marble Halls: Drawings and Models for Victorian Secular Buildings" (Victoria and Alber Museum: England, 1973).

³⁷ "Modernism in Miniature: Points of View", <https://www.cca.qc.ca/en/events/3161/modernism-in-miniature-points-of-view> [Last access on 14.01.2020]



Figure 2.1 Installation view of “Modernism in Miniature: Points of View” curated by Davide Deriu, 2011.

Source: <https://www.cca.qc.ca/en/events/3161/modernism-in-miniature-points-of-view>

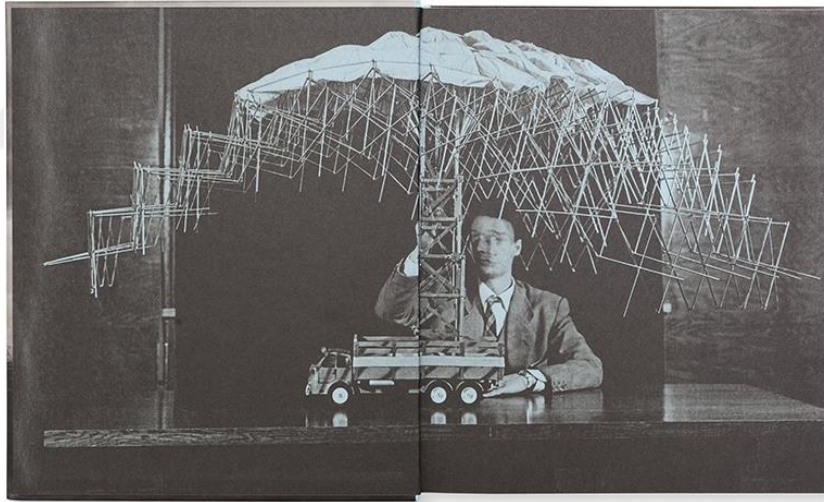


Figure 2.2 Image from the Catalogue for the exhibition ‘Camera and Model.’ Image Courtesy of La Fábrica.

Source: <https://www.metalocus.es/en/news/modelling-camera-photography-architectural-models-spain-1925-1970>

Model photography became the main subject of an exhibition and book prepared by an academic research group³⁸ in Spain in 2016. “Modelling for the Camera: Photography of architectural models in Spain, 1925–1970” is an exhibition curated by Iñaki Bergera at ICO (Instituto de Credito Oficial) Madrid in 16.02.2017-14.05.2017. It focuses on architectural models created in Spain between 1925 and 1970, the decades in which the modern architectural movement was born and developed.³⁹ The exhibition is based on a book with the same title, published in 2016. The book includes the model photographs of Spanish architects and photographers and also essays written on the subject of this particular practice.



Figure 2.3 Model photo of Le Corbusier's Pavillon des Temps Nouveaux, Paris.
Model: GSAPP students, photo: James Ewing.

Source: <https://www.dezeen.com/2017/02/08/columbia-university-gsapp-student-architectural-models-james-ewing-photos-stagecraft-exhibition/>

³⁸ Their project is called FAME (Fotografía y Arquitectura Moderna en España, [Photography and Modern Architecture in Spain]), working under the leadership of architect and professor Inaki Bergera, with financial support from government agencies. The group has been working with missions such as compiling the architectural heritage of this period through architectural photographs and reconstructing its theory and history.

³⁹ José Juan Barba, “Modelling for the Camera. Photography of Architectural Models in Spain, 1925-1970”, Exhibition Review. <https://www.metalocus.es/en/news/modelling-camera-photography-architectural-models-spain-1925-1970> [Last access on 14.01.2020]

The latest exhibition “Stagecraft: Models and Photos” was held in The Arthur Ross Architecture Gallery between 9.02 – 10.03.2017 and presented newly commissioned photographs by James Ewing with six models of significant 20th-century buildings which were found in the archives of the Columbia University Graduate School of Architecture. (Figure 2.3) Students produced the models during the 1990s and early 2000s as part of professor “Kenneth Frampton’s pedagogical exploration of the history of architectural tectonics.”⁴⁰



Figure 2.4 Installation view from the exhibition “Architectural Model Making in Turkey,” Photo: Sahir Uğur Eren (2017)

Source: <https://www.arkitera.com/soylesi/bir-maket-muzemiz-olsa-muthis-olmaz-mi/>

In the case of Turkey, the only exhibition dedicated to models and their photographs is “Architectural Model Making in Turkey” (17.11.2017 – 19.01.2018). It is a phase of a long-term work in progress, which is curated by Pelin Derviş and focuses on the well-known actors of architecture, and their production. This exhibition includes the models and their photographs that represent the modern architectural production in Turkey in the 20th century and interviews with five model makers of five generations: Yusuf Z. Ergüleç, Selahattin Yazıcı, Mehmet Şener (Atölye 77), Varjan Yurtgülü (Min Tasarım) and Murat Küçük (Atölye K). The exhibition draws

⁴⁰ <https://www.arch.columbia.edu/books/reader/221-modeling-history>, [Last Access on 20.02.20]

attention to the problems of documenting and storing models, photographs, and drawings in Turkey.⁴¹

2.2 Photography

2.2.1 The History and Theory of Photography

The discovery of the camera is the result of the technological, social, and economic developments of the 18th century. The emergence of photography in the 1840s can be explained by the drive created by the demands of societies for a reliable visual recording medium.⁴² The medium diversified into different fields of expertise. In the section above, theories on photography's effect on architecture had been covered. The general theory on photography might be useful to approach model photography from another perspective. In the paragraphs below, a concise history will be given with reference to John Roberts, who is a professor of art and aesthetics.

The theory of photography has dealt with the issues resulting from photography's role in the "production and exchange of commodities."⁴³ Roberts notes that the writers of the first wave of this literature are said to be Roland Barthes, Susan Sontag, Victor Burgin, Rosalind Krauss, John Tagg, Vilem Flusser, and Henri Van Lier. These authors emphasized "photography's embeddedness in relations of production and relations of power and truth," and photography's effect in "the reification of things."⁴⁴ The purpose of this wave was to "de-aestheticize" the history of photography. According to Roberts, the second wave of literature is said to include works of Allan Sekula, Richard Shiff, Molly Nesbit, Steve Edwards, and Blake

⁴¹ <https://www.studio-xistanbul.org/tr/events/turkiyede-mimari-maket>, [Last Access on 20.02.20]

⁴² Liz Wells, (ed.). "Photography: A Critical Introduction" (Routledge, 1997), 12-3.

⁴³ John Roberts, "Photography and its Truth-Event", Book Review, Oxford Art Journal, 31.3 2008, 464

⁴⁴ Ibid.

Stimson. They generally thought that photographs were different kinds of pictures, “that is, they are light traces, indices of things, and as such the result of the ‘spontaneous’ ordering of contingent appearances.”⁴⁵ With the effect of digitalization, a group of authors turned back to the first wave thoughts. Joel Snyder, Geoffrey Batchen, Andrew Benjamin, and Michael Fried were saying that indexicality was not lost, but it was not as significant as stated before. The emphasis on the figurative potential of the photograph restricted “the ‘objectivist’ and functional role of the photographer.”⁴⁶ The debates on the ontological status of photography have not dissolved yet, and the interest in photography seems to persist in the future.

The theory of photography has shown its effect in the field of architectural photography and architecture over time. Theses about representation in architectural theory, which were mentioned in the previous section, were produced in parallel and related to photography theories. The active role of photography in the creation and diffusion of the modernist movement in architecture has been proven, and architectural photography has been evaluated in a more sophisticated way since then. Professional architectural photography practice and the role of photography in architectural history writing has been widely criticized.⁴⁷

2.2.2 Conceptual Studies of Artists

There is a group of photographers which can be called “the maquette and model builders”⁴⁸ including Thomas Demand (b. 1969), James Casabere (b. 1953), Oliver

⁴⁵ Ibid.

⁴⁶ Ibid.

⁴⁷ Iain Borden, “Imaging architecture: the uses of photography in the practice of architectural history” in *The Journal of Architecture*, Volume 12, 2007 - Issue 1.

⁴⁸ Saskia Asser & Els Barents, “Fake but accurate: Edwin Zwakman”, Catalogue of the Exhibition at Huis Marseille, Amsterdam, (2008), 120

Boberg (b. 1965), Edwin Zwakman (b. 1969), Bernard Voïta (b.1960)⁴⁹ and Michael Paul Smith⁵⁰ (1951-2018). These artists perform independently, but using the technique of modelmaking for the purpose of photography is their common ground. In general, they explore the interaction between reality and photography through the medium of model photography.

The works of these photographers provide a conceptual ground for the discussion of model photography in architecture. It is not surprising that architectural theorists have collaborated with these artists. Beatriz Colomina has written an article for Thomas Demand and evaluated his work from the perspective of architectural model photography. Similarly, Hal Foster and Anthony Vidler have written articles for James Casabere. These texts have been beneficial for the evaluation of model photography in this thesis.

Model photography is a relatively small and specialized practice within photography. It is a part of “staged photography,” which consists of mostly directorial and advertorial approaches and questions the widely accepted claim for its documentary value. The capability of models for the construction and control of the depicted scene and the artistic potential of photography provide advantages to this technique. General information on staged photography will be given because this genre is differentiated from other artistic photography with its availability for the construction of fiction. Generally, a non-real environment was created to capture this image, but this scene was constructed in the real world, even though it was fictional.

⁴⁹ A published dissertation about the artistic practice of photographers of models had been prepared by Ralf Christofori in 2003 with the title of “Bild - Modell – Wirklichkeit: Repräsentationsmodelle” in der zeitgenössischen” [Picture - Model - Reality: Representative models in the contemporary]. He includes the works of Oliver Boberg, Edwin Zwakman, Laurie Simmons, Lois Renner, David Levinthal, Thomas Demand, and James Casebere. The reviews about the book tell that Christofori examines the representational function of artistic photography through different approaches of these artists.

There has been an exhibition dedicated to model builders arranged by Sabine Dorscheid (b.1969), held in Vienna (2005) and Bergen (2006), in the name of “Post-Modellismus, Models in Art / Modelle in der Kuns.”

⁵⁰ I got acquainted with Michael Paul Smith and his project “Elgin Park” thanks to Pelin Derviş.

Staged photography uses the theater as a model and carries it to the environment of the image using the storytelling techniques of the theater.⁵¹

Staged photography was practiced in the name of “staged, costumed or tableau photography” in America, France, and Britain during the early days of photography.⁵² However, the definition of the genre belongs to a recent categorization in the art market. Dorscheid summarizes the history of staged photography of the 20th century, in the following paragraph.

Like Laurie Simmons, they ushered in the ‘staged photography’ which took off in the 1970s in the USA and, subsequently, in the 1980s, gained ground in Europe. While photographic mise-en-scènes already appeared in advertisements in the 1950s, they were only taken up by art twenty years later in the so-called ‘directorial mode’ (A. D. Coleman coined this term in 1976). From the 1980s, photography-informed models worlds quickly multiplied and exhibitions traveled throughout Europe. The staging of motifs helped photography to succeed in the art world as a large format. Large-format photography became an equal competitor of painting and a visible factor in the art market in the 1990s.⁵³

The transformation of the status of staged photography from the 19th century to the 20th century is significant. In her dissertation, Marta Rachel Weiss investigates the photographs and albums of this genre belonging to the Victorian era. She explains that the historians of photography like Beaumont Newhall and Helmut Gernsheim regarded staged photography as a “low” art form and ignored most of the time. The idea of representing imaginary with the realist medium of photography was considered as vain because there was already a more capable medium for this practice: the painting. However, in the 21st century, this practice attracts scholarly attention, and this dissertation presents a vast collection of staged photography from

⁵¹ Anne H. Hoy, *Fabrications: Staged, Slttered, and Appropriated Photographs*, (Abbeville, 1988)

⁵² Marta Rachel. “Dressed up and pasted down: Staged photography in the Victorian album” (unpublished Ph.D. Thesis, Princeton University, 2008), 1.

⁵³ Sabine Dorscheid, “Introduction” in *Post-Modellismus, Models in Art / Modelle in der Kuns*, 6 (Paranthesis is the same in the original text.)

the past, which has similarities with the experience of “pre-photographic social activities such as charades, tableaux vivants, fancy dress, and amateur theatricals.”⁵⁴

2.2.2.1 Photographing Constructed Place

Model-maker photography artists mostly deal with the concepts of representation and reality. Thomas Demand questions the nature of artistic and documentary photography and reveals the unreliability of the photographically documented reality. He selects documentary photographs of politically significant events that have taken place in the past from the archives of journals. Then, he makes a paper model with a scale of 1/1. He erases things from the image according to what remains in his mind from his encounter with this scene. He produces the model only for photographic purposes and even distorts it to provide a realistic perspective view. He uses a large-format camera. After the shooting, he destroys the model, and the model does not get recorded from different angles. He displays his photographs behind large plexiglass screens.

Demand does not differentiate the point of view and the historical references of the image according to the original photograph he is referring to. He eliminates necessary details that give too much information on the model. In the gallery, the viewer thinks that the photo looks realistic, and it takes some time to understand that it is a model photograph until he/she recognizes the oddities in the photograph.

Hilde van Gelder and Helen Westgeest, who are professors in art history, discuss the concept of space in photography in their book, *Photography Theory*. They say that most of the time, photography indicates a sense of space, let it be actual or constructed. They separate the concepts of place and space; while the place is “a meaningful location” for man, space is more abstract. Thomas Demand’s work *Kitchen* is used here as an example for “constructed, non-existent place,” which is a

⁵⁴ Marta Rachel Weiss, “Dressed up and pasted down: Staged photography in the Victorian album”, (unpublished PhD Thesis, Princeton University, 2008) 10-5.

less investigated issue in photography theory. They claim that, in terms of indexicality, the model in the photograph may indicate an actual place. However, the model photograph does not refer to the actual space, but to the object it represents, the model.⁵⁵

The remarks of viewers about the quality of space in Demand's photographs are significant to understand the artist's intentions. Van Gelder and Westgeest say that "Kitchen presents a somehow unnatural place. Everything seems made from the same material and looks brand new, as well as a bit stylized." Architectural photographer Alice Clancy adds that "His photographs offer a cleaner, neater vision of the world, the surfaces are smooth and the edges sharp," in the introduction of an interview with the artist.⁵⁶

Art Historian, Donna West Brett explains the unnaturalness in Demand's photographs raises awareness in the audience that they are not ordinary photographs of an existing place: "the relationship between the photographic-ness of these images, the evocation of an indexical connection and its undoing — in regard to the original images that Demand has sourced and our collective memories of them."⁵⁷ It is a deliberate choice for the artist to emphasize that his photographs are representations. Brett adds that "His intention, however, is not to picture the event or to copy the photograph, but rather to imagine what a memory of the photograph might look like."⁵⁸ Demand explains this in his own words:

"Whenever we remember something, we recreate it at the time of memorizing. We reconstruct the picture in front of our inner eye all the time.

⁵⁵ Hilde Van Gelder and Helen Westgeest, "Place and Space in Photography" in *Photography Theory in Historical Perspective*, (Wiley-Blackwell, 2011), 112-21

⁵⁶ Alice Clancy, Ciara Grace and Thomas Demand, "Eye to Eye: An Interview with Thomas Demand", *Building Material*, No. 19, *Art And Architecture* (Autumn 2009), 73, <https://www.jstor.org/stable/29792382> [last accessed on 15-05-2019]

⁵⁷ Donna West Brett, "Banality, Memory and the Index: Thomas Demand and Hitler's photographer", *Photographies*, 9:3 (2016), 239

⁵⁸ *Ibid*, 240

It's not like rewinding a tape and playing it again. Pictorial memories are completely artificial: you can make them up again and again."⁵⁹

Demand's experimentation of the model photograph arrives at a point far away from the general expectancy for the objectivity of the photograph. The awareness he arouses in the viewers of his collections is vital for the media literacy of contemporary societies.



Figure 2.5 Thomas Demand, Kitchen (2004)

Source: <http://www.bbc.com/culture/story/20140915-inside-saddam-husseins-kitchen>

In a monograph of Demand, Beatriz Colomina has written an article and said that Demand and herself were standing at the same point in terms of their opinions. She added that Demand was saying that media is architecture, and herself saying that modern architecture is media.⁶⁰ A model photograph as a form of meta-representation, may be ideal for representing architecture, which is in continuous interaction with the media. Architectural practice and media are fields that have long

⁵⁹ Jane Ure-Smith, "Thomas Demand at the Neue Nationalgalerie", *Financial Times*, (August 14, 2009), 10

⁶⁰ Beatriz Colomina. "Media as Modern Architecture", in *Thomas Demand*. (London: Serpentine Gallery, 2006) 19–46.

been intervened and transformed by humans, and their relationship with reality and artificiality is complicated. Demand's photographs convey the state of architecture and photography, which are always open to the intervention of man by using the potential of the model photograph. The spaces coded as real in our consciousness reveal their artificiality with a more careful examination in Demand's photographs.



Figure 2.6 Debris litters the kitchen used by Saddam Hussein before he was captured, Dec. 15, 2003. Credit: AP

Source: <https://www.cbsnews.com/pictures/saddams-hideout/8/>

2.2.2.2 Photographing the Imaginary

The oeuvre of James Casabere consists of model photographs representing imaginary worlds of different cultures: American suburbs, prisons like the panopticon and flooded spaces. His works do not refer to any existing place. He uses objects which are not always coherent in scale and does not hesitate to include atmospheric effects such as light, shadow, fire, water, and reflection. Hal Foster says that the viewer cannot associate the photograph with the outside world and is forced to ignore his/her daily experience of photography. "Neither referential nor indexical quite, his images are akin to phantasms in which representation has revised, even

usurped, reality. At times the viewer feels drawn inside these simulacra, and they, in turn, appear distorted by his or her imagined presence within them.”⁶¹

Architectural theorist Anthony Vidler evaluates Casabere’s works in his essay, “Staging Lived Space.” He says that the model is not an end itself; instead, it is a tool for constructing a photograph. The imperfection of the models helps them not to be mistaken for actual places. He summarizes the characteristics of the photographs as follows:

“First in line, they are sets, settings, without characters – the human is entirely absent, signified by abandoned objects, rooms, and space. There is no interpenetration of the aura of the portrait and the aura of the setting [...]. Second, the spaces constructed and photographed with such care are fundamental “abstract” spaces. This does not mean that they are representative of abstract architecture, nor that they are perfect replicas of spaces formed out of pure geometry. They are spaces, rather, that ostentatiously flaunt their techniques of fabrication: they are obviously models, with the imperfections of jointing, gluing, cutting, entirely unmasked, even highlighted by enlargement.”

Thirdly and apparently paradoxically for so abstract a group of settings, these photographs are captioned; they are subject, as Benjamin would say, to “inscription.” [...]

After that, he uses the term *spatial unconscious* by giving reference to Benjamin’s *optical unconscious*⁶³. Vidler continues with Benjamin’s characterizing photography as “a mechanism for revealing spatial secrets,” which was only possible with the experience of the body. Benjamin was declaring that “the space informed by the unconsciousness” was replacing the space comprehended by the eyes of a conscious mind. In the following paragraphs, he refers to Michel Foucault’s concepts of *dream-space* and *lived space*. For Foucault, “the geometric space of science and the geographic space of mapping” was secondary to living space, which was

⁶¹ Hal Foster, “Camera Imaginaria” in Okwui Enwezor (ed.), *James Casebere: Works 1975-2010* (Bologna, Italy: Damiani Editore, 2011), 12

⁶² Anthony Vidler, “Staging Lived Space: James Casabere’s Photographic Unconscious” in *James Casebere: The Spatial Uncanny* (Milan: Charta; New York: Sean Kelly Gallery, 2001), 12-3

⁶³ Walter Benjamin said that by the aid of photography it became possible to capture movement which is not limited by the capacity of human eye.

comprehended through other senses. He also refers to term *dark space* in contrast to *light space*, defined by Eugène Minkowski, who was a psychiatrist and philosopher. He says that Casabere's photographs can capture dark space. Even though it is a contradiction to represent dark space visually, Vidler explains that the photographs give an impression of "tactile accessibility" that the viewer can remake the model himself/herself.⁶⁴



Figure 2.7 James Casabere, Landscape with Houses 9, 2011

⁶⁴ Anthony Vidler, "Staging Lived Space: James Casabere's Photographic Unconscious", 14-9

2.2.2.3 Miniaturization of the Actual

Olivo Barbieri is an artist with a different approach to model photography. Barbieri does not take model photographs, but the aerial photographs he takes resemble model photographs. Barbieri takes aerial photographs of iconic buildings and cityscapes with the technique of reverse tilt-shift. Tilt-shift is a mechanism that architectural photographers use all the time, and it helps to change the undesirable effects of the perspective. When a photographer takes a photograph of a tall building from the ground level, the vertical lines of the building seem to join at the top of the Picture. With the tilt-shift mechanism, the photograph turns into a two-point perspective picture of the building.

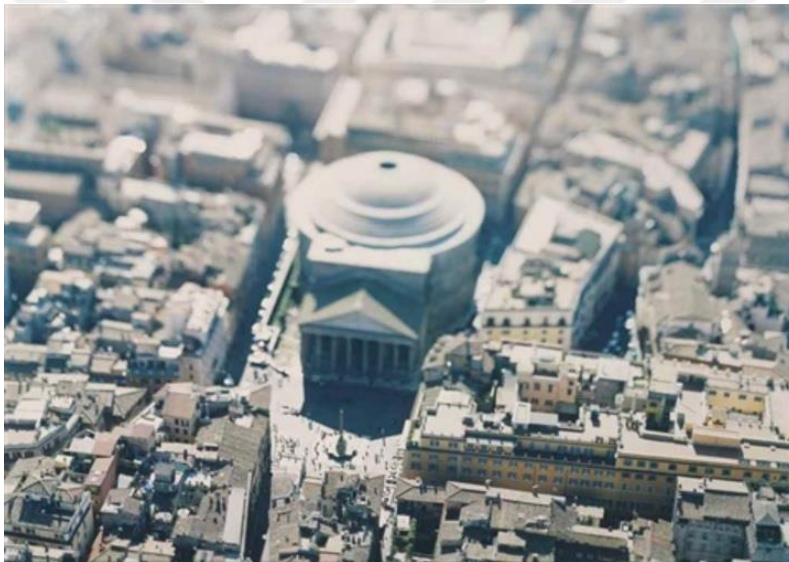


Figure 2.8 Oliver Barbieri, Site specific_ROMA 04 (Pantheon), 2004

Architectural historian, Mark Morris analyzes his approach in an article in *Camera Constructs*. Olivo Barbieri takes the photographs from above with a reverse tilt-shift mechanism, and this action causes the actual buildings to turn into small-scale models. This effect is quite shocking when someone sees the Colosseum or the Disney Concert Hall as a model in its original context. Barbieri plays with the focus, and this increases the effect of model photography. Morris says that the Colosseum turns into a souvenir, and the Concert Hall resembles the cars in shape and material.

This view seems to diminish the importance of the architecture, and Morris relates this practice to the urge of miniaturization. It is possible to understand complex structures in the simplified world of miniatures. Barbieri turns the most significant accomplishments of the man into models and makes them understandable for us.⁶⁵



⁶⁵ Mark Morris, “Worlds Collide”, in Andrew Higgott and Timothy Wray (eds.), *Camera Constructs: Photography, Architecture and the Modern City* (Ashgate, Farnham, 2012), 182-4

CHAPTER 3

MILESTONES IN THE HISTORY OF MODEL PHOTOGRAPHY

Terminology clarified that people had made both models and miniatures since the earliest civilizations.⁶⁶ Modelmaking is still a popular tool in architectural practice and education despite the widespread use of digital tools. In this chapter, it is aimed to define important technological developments that opened new areas of use and led to socio-cultural changes in architecture throughout the history of model photography. Paintings of models, model photos, model photos that pretend to look like architectural photos, photomontages, and analog simulations will be analyzed to understand how technological developments have changed the use of model photography in history.

In the first part (3.1) of this chapter, previous modes of modelmaking will be briefly investigated to understand the effect of photography on models. The primary properties of the model and miniature are materiality, three-dimensionality, and distortion through size-reduction. Furthermore, miniatures and models are human-made artifacts; therefore, they are products of culture. As they are used as tools for representation, to understand the information they convey, at first, their effects on the human being will be investigated.

⁶⁶ Karen Moon, *Modeling Messages*, 33

3.1 Before Photography

3.1.1 The Effects of Miniaturization

To explain the effects of miniaturization, two essential paragraphs from the classical book of Claude Lévi-Strauss, *The Savage Mind*, will be quoted. He summarizes people's interest in miniaturization and the intellectual gains they get from this process. Lévi-Strauss is often referenced in articles about archeology and material culture about miniature, but his conclusions are also enlightening about the architectural model.

What is the virtue of reduction either of scale or in the number of properties? It seems to result from a sort of reversal in the process of understanding. To understand a real object in its totality, we always tend to work from its parts. The resistance it offers us is overcome by dividing it. Reduction in scale reverses this situation. Being smaller, the object as a whole seems less formidable. [...]

[...] But miniatures have a further feature. They are 'man-made' and, what is more, made by hand. They are, therefore, not just projections or passive homologues of the object: they constitute a real experiment with it. Now the model being an artifact, it is possible to understand how it is made and this understanding of the method of construction adds a supplementary dimension. [...] In other words, the intrinsic value of a small-scale model is that it compensates for the renunciation of sensible dimensions by the acquisition of intelligible dimensions.⁶⁷

When the prototype turns into a miniature, the original function of the prototype can no longer be applicable after its distortion through miniaturization. The change of scale in accordance with the body causes this notion. Lin Foxhall, who is a professor on Archeology, says that manufactured objects can accommodate the natural dimensions of the human body so that the change in the object's scale leads to a change in its original function.⁶⁸ Susan Stewart, who is a poet, and professor in the

⁶⁷ Claude Lévi-Strauss, *The Savage Mind* (University of Chicago Press, 1966), 23-4

⁶⁸ Lin Foxhall, "Introduction: miniaturization", *World Archaeology*, 47:1 (2015), 1-5

Humanities, explains further the relation of the body with the object. “The body is our mode of perceiving scale and, as the body of the other, becomes an antithetical mode of stating conventions of symmetry and balance on the one hand, and the grotesque and the disproportionate on the other.”⁶⁹ She points out to the fact that the body is a primary reference to judge the objects around us. Foxhall continues that, with the change in scale and regarding the body, the ordinary can turn into the extraordinary. “Hence, a miniature can serve as a physical manifestation of a thought experiment, a kind of gateway to fantasy or alternative realities which allows the users to think the unthinkable.”⁷⁰

Susan Stewart draws attention to the relation of miniature and time: “The reduction in scale which the miniature presents skews the time and space relations of the everyday lifeworld, and as an object consumed, the miniature finds its ‘use-value’ transformed into the infinite time of the reverie.”⁷¹ Carl Knappett, who is a scholar in Archeology, refers to Bailey’s comments on Alton DeLong’s psychological experiments⁷², showing that “spatial compression (miniaturization) can at the same time instill a proportionate temporal compression.”⁷³ Knappett and Bailey say that the perception of time changes during the experience of miniaturized space, meaning that the sense of time passing is affected by the scale of the space exposed. In DeLong's experiments, people who experience miniaturized spaces of different scales, without any other time reference, have said that half an hour has passed in much shorter time intervals. The smaller became the scale, the quicker passed the time.

⁶⁹ Susan Stewart, *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection* (Duke University Press Books, 1984), xii

⁷⁰ Lin Foxhall, “Introduction: miniaturization”, 2-3.

⁷¹ Susan Stewart, *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection*, 65

⁷² Carl Knappett, “Meaning in Miniature: Semiotic networks in material culture” in Niels Johannsen, Helle Juel Jensen, Mads D. Jessen (eds.), *Excavating the Mind: Cross-sections through Culture, Cognition and Materiality* (Aarhus University Press, 2012)

⁷³ Bailey 1995 pp.36-8, DeLong 1983

Miniaturization is a practice that includes tactile play. The experience of individuals who produce diorama for their hobbies and collections can be a meaningful example for tactile play. Petra Tjitske Kalshoven, who is an expert on cultural anthropology, investigates the relationship between diorama and war game enthusiasts and miniatures upon her field research at different locations. What she sees as the intrinsic motivation of the diorama is “a quintessentially contemporary pleasure that owes as much to contact and immersion in materials as to a distancing and abstracting from the miniature terrain through different forms of measurement and layers of representation.”⁷⁴

Kalshoven refers to Walter Benjamin, saying that the art of storytelling and the time-consuming crafts disappear quickly when the modern man desires to simplify everything. Storytelling and genuine crafts require the human soul, eye, and hand to work together. With the disappearance of these crafts, ‘mimetic’ skills disappear. The author says that these disappeared skills reappear in the leisure activities of the post-industrial period. In the games called “historical re-enactment,” the players model past wars, landscape and organize them with warrior figures. These scenes may be applicable in professional education and entertainment sectors. The author says that the players' enjoyment is both a close relationship with the material world and abstraction at the same time.

Finally, it can be said that the experience of the miniature was mainly based on its interaction with the human body and mind in early times. It was one of the first media people used to reimagine the world from another point of view. The models and miniatures were able to change people’s perception of time and space.

⁷⁴ Petra Tjitske Kalshoven, “The World Unwraps from Tiny Bags: Measuring Landscapes in Miniature”, *Ethnos*, 78:3 (2013), 352

3.1.2 Representation of the Model

The use of miniature dates to ancient times⁷⁵ and miniature artifacts are objects of research in archeology, anthropology, material culture studies. In material culture studies of ancient eras or contemporary primitive tribes, it is said that miniature has been used to transfer and circulate the knowledge of non-movable, large-scale objects like houses.⁷⁶ Moreover, architectural models have been used as “specimens” for the 1/1 scale construction for a very long time.⁷⁷ J. J. Coulton says that models were used by Greek architects to transmit their ideas to the builders during Classical Antiquity.⁷⁸ This type of model was called *paradeigma* in Greek, and it was defined as “a specimen or an example used to study specific architectural elements, such as triglyphs or capitals which required a three-dimensional design, and in cases where carved or painted decoration has to be shown.”⁷⁹

Besides bearing technical information, miniatures/models can also bear information on culture. The miniatures were used in “cultic, funerary and domestic settings” in the past. Oliver Pilz, who is a scholar in Classical Archeology, analyzes Greek miniature objects from the perspective of semiotics. He describes them as “devices of social communication in the larger framework of a complex sign system.”⁸⁰

If the practice of miniaturization is consistent through time, similar motivations for its utilization can be suggested. The aim of this study is not to directly compare the use of miniature in ancient and modern times. These are not only temporally distinct

⁷⁵ Porter and Neale, *Supermodels*, 2000, 2.

⁷⁶ Christopher Evans, “Small devices, memory and model architectures: Carrying knowledge”, *Journal of Material Culture* 17:4, 2012.

⁷⁷ Karen Moon, *Modeling Messages: The Architect and the Model*, 34

⁷⁸ J. J. Coulton. *Greek Architects at Work: Problems of Structure and Design* (Cornell University Press, 1982), 55-7. (First accessed from Moon, 34)

⁷⁹ Albert C. Smith, *Architectural Models as Machine*, 10

⁸⁰ Oliver Pilz, “The uses of small things and the semiotics of Greek miniature objects”. *Pallas*, 86, 2011.

but also socially and economically different eras. Over time, the objects that people used, the purposes and shapes of use, and the values they place on objects have changed. Miniature did not come out of human life. Some roles went into the background, and some roles changed shape.

An architectural model is a tool for the generation of architectural design in the first place, and then it represents the final work of the architect. In the end, it provides a medium for the architect and the client, patron, or future buyers to communicate and agree. This process can be the base to understand the dynamics which create the architectural model as it is accepted today. Architectural historians give an early example of the use of the model for the persuasion of the client. The following anecdote from the tenth book of Vitruvius gives details from the use of scale model in the Roman Empire.

For Diognetus was a Rhodian architect, to whom, as an honour, was granted out of the public treasury a fixed annual payment commensurate with the dignity of his art. At this time an architect from Aradus, Callias by name, coming to Rhodes, gave a public lecture and showed a model of a wall, over which he set a machine on a revolving crane with which he seized on Helepolis as it approached the fortifications, and brought it inside the wall. The Rhodians, when they had seen this model, filled with admiration, took from Diognetus the yearly grant and transferred this honor to Callias.⁸¹

The representation of the model in two dimensions was used in the time of the Roman Empire. The image (Figure 3.1) shows an impressive example of mosaics from Hagia Sophia, showing a composition of the Virgin Mary and Child Jesus, receiving from Justinian a miniature of Hagia Sophia and from Constantine, a miniature of the city of Constantinople.⁸² The date of mosaics is estimated not to be before 1050,⁸³ and

⁸¹ Vitruvius, *The Ten Books on Architecture*, Translated by Morris Hicky Morgan (New York, NY: Dover Publications, Inc., 1960), 315-6 (First accessed from Albert C. Smith, *Architectural Models as Machines*, 14)

⁸² This example was given by T. Elvan Altan, Panel, “Mimarlık Arşivinde Maketin Yeri” for “Düşünme ve Görselleştirme Aracı Olarak Türkiye’de Mimari Maket” exhibition.

⁸³ Charles Rufus Morey, “The Mosaics of Hagia Sophia”, *The Metropolitan Museum of Art Bulletin*. March (1944), 210

presenting the models of churches to Christ was a recurrent theme of representation in churches since the sixth century.⁸⁴



Figure 3.1 Mosaics located over the south door in the vestibule. Hagia Sophia, İstanbul.

Louis Demos investigates the history of this particular mosaics and asserts, “The models of Hagia Sophia and Constantinople had iconic status. Architectural images of holy places enjoyed a rank and value equal to the saints portrayed in icons as objects of veneration.”⁸⁵ Then he explains the purposes behind the use of the mosaics for the donors, in this case, the Roman Emperors of the era.⁸⁶

Donors had their images placed in the apse vault for two reasons. First, the donor had his portrait and name recorded for posterity. Second, his image was seen in the company of the saints, the angels, and Christ. His offering of

⁸⁴ Louis Demos, “Seeing Salvation: The Mosaic in The Southwest Vestibule of Hagia Sophia, Istanbul”, Unpublished M.A. Thesis, The Florida State University (2013), 99

⁸⁵ Ibid, 65

⁸⁶ Demos further explains that this representational tradition is related to “numismatic examples from Roman Asia Minor, particularly Smyrna, Lesbos, and Philippopolis, which depict emperors presenting models of temples to the patron goddess of a city.” Ibid, 55

the church model allowed for the hope that the intercessions of the saints would help him on Judgement Day, and that he might hope for eternal life with Christ.⁸⁷

Eduardo Pierto gives the example of a similar painting by Murillo, which represents the patrons of Seville, holding the model of the Giralda Tower. He tells that votive offering in Catholics is traditional and describes these models as “icons of devotion and intercession.” He resembles this painting to the photograph of a contemporary architect, Philip Johnson holding his model on the cover page of Time magazine and says that the model continues to be a devotional icon even after it became the tool of the architect.⁸⁸



Figure 3.2 Left, Murillo Esteban Murillo Bartolome’s 1666 painting of St. Justa and St. Rufina, (Seville Museum of Fine Arts)

Source: <https://www.artehistoria.com/es/obra/santas-justa-y-rufina-0>

Figure 3.3 Right, Philip Johnson holding his model on the cover page of Time magazine

⁸⁷ Ibid, 100

⁸⁸ Eduardo Pierto. “The Architect and his Model” in *Modelling for the Camera, Photography of Architectural Models in Spain*, 66

This photograph of Philip Johnson is quite famous as a model photograph, and another author⁸⁹ thinks that the model acts as a trophy in that image. Images are always prone to different interpretations, but it can be seen that the model as an object in the hands of men is a recurrent theme no matter what form of representation it is used.

A significant example of the 2d representation of the model from Renaissance is the painting depicting Michelangelo presenting the model of the Cupola of St. Peter's to Pope Paul IV (1619). Karen Moon says that this painting successfully represents the importance of models to both architects and clients in the Renaissance period.⁹⁰ The change of the client profile between different periods also gives a clue about the transforming practice of architecture. It can be stated that the socio-cultural state of the era has a direct effect on people's use of scale-models and their representations. The human developed the potential of the model along with history, but the economic and socio-cultural conditions of the societies encourage professionals to choose particular tools over others.

The model collection of John Soane has been the subject of pictures by Joseph Gandy. John Soane (1753-1837) was an official architect of the state and a professor at the Royal Academy in London. Soane was using models in his design work and in his lectures in the Academy.⁹¹ These models have been exhibited in the Soane House, now a museum, but they are mostly known from the pictures of Joseph Gandy, who was an English artist, visionary architect, and architectural theorist. Gandy depicts all of Soane's realized or unrealized works in the atmosphere of the house. (Figure 3.4)

⁸⁹ Amanda Kolson Hurley, "Will a Postmodern Icon be 'Glasswashed'?", <http://www.docomomo-us.org/news/will-a-postmodern-icon-be-glasswashed>, [Last Access on 28.01.2020]

⁹⁰ Karen Moon, *Modeling Messages*, 38.

⁹¹ John Wilton- Ely, "The Architectural Models of Sir John Soane: A Catalogue", *Architectural History*, Vol. 12 (1969), pp. 5-38+81-10



Figure 3.4 Joseph Gandy (for John Soane), Various Designs for Public and Private Buildings: 1780-1815



Figure 3.5 Sir Denys Lasdun, Models, National Theatre, London, 1964-5.

Haluk Zelef considers that this painting looks similar to the model photographs, which depict the piles of models in the architectural offices. Zelef adds that Gandy's

painting evokes the photographs of hangars filled with mock-ups that show the vast amount of models architects produce, as we see in many monographs today. This kind of photographs that display a group of architectural models (Figure 3.5) can be regarded as a subgenre of model photography.⁹²

In the next section, the change of the model in relation to photography, and the differentiation of its use following modern forms of perception will be examined with cases. It will be argued that the photographic image has a transforming effect on the practice of modeling and genuine experiences of modeling stay behind the dominating ways of seeing.

3.2 The Model and its Image After the Advent of Photography

The photograph converts the three-dimensional model into a two-dimensional image. In other words, it reduces the spatiality of the model to a graphic and perspective image. The models are deliberately abstracted and deformed objects. Since the model that constitutes the photograph's subject is also a representation tool, architectural ideas pass through the filter of a two-layered representational medium in model photographs.

Model photographs are usually images that lack any reference to a living creature or a context. The photographer is not photographing a real place but an object representing the space designed by the architect. All photographic images are inevitably detached, interpreted, and coded, but this is more evident for model photographs. When examining a model photo, the mind must first adapt itself to a different scale and then interpret the content of the photograph as both an object and a mental work of the architect. Model photography is a type of photography that falls within the technical expertise of the photographer as well as the architect.

⁹² Haluk Zelef, thesis discussion.

By the definition of model photography, it is aimed to cover different practices of representing constructed space by using modelmaking. Therefore, only a part of model photography can be evaluated in the scope of architectural photography. While architectural photography serves for the representation of architectural space, model photography serves for the representation of fictive space.

In general, model photography is included in the field of macro photography.⁹³ This category refers to the photographs of relatively small objects, in which the camera focuses closely to optimize the size of the subject in the target. There are two approaches in this regard; either the entire model is in focus and depth of field is deep to maximize its document value, or depth of field is shallow, and only a portion of the image is sharp to give a sense of depth to reflect the real-life viewer's perspective. The model photo is taken in the studio. The process behind the camera is invisible: the preparation of background, lights, and the cameras take time and effort.

The first recorded use of model photography was Charles Garnier's model photos for the competition of Paris Opera House in 1861, and it served for design purposes. In 1866, Owen Jones combined a model photo of the model of the National Gallery in London and a site photograph with the superposition technique.⁹⁴ In the 20th century, with the increasing use of model making and publishing, it probably experienced its most popular period.⁹⁵ With the introduction of digital modeling in the 1980s, the use of model photography decreased, and there occurred a shift towards virtual three-dimensional images.

⁹³ Özer Kanburoğlu, *Mimari Fotoğraf* (İnkılap Kitabevi, 2008), 176

⁹⁴ Karen Moon, *Modeling Messages*, 67-8. Reference to John Physick and Michael Darby in *Marble Halls: Drawings and Models for Victorian Secular Buildings*.

⁹⁵ Davide Deriu, "Transforming Ideas into Pictures: Model Photography and Modern Architecture" in Andrew Higgott and Timothy Wray (eds.), *Camera Constructs: Photography, Architecture and the Modern City* (Ashgate, Farnham, 2012), 159

3.2.1 Reproducibility

The effect of photography in the world of representation is very significant, and its “capacity for infinite reproductions” seems to be the most critical factor for the transformation of the societies. The photographic image can access a broader audience in more significant amounts than the model. The model photograph is generally more effective in terms of accessibility and popularity.

For example, Tatlin’s Tower, the project for the Monument to the Third International, was never built, but the architectural community knows it very well. It was the centerpiece for the movement of Constructivism and was successfully using the language of new materials and technological developments of the era. The original model, which was built by Tatlin and his students in 1919, could not be preserved, and only a small number of drawings and model photographs had survived afterward.⁹⁶



Figure 3.6 Photomontage of Tatlin Tower and St. Petersburg, seminar.

Source: Klaus Bollinger, Florian Medicus, *Unbuildable Tatlin?!*

⁹⁶ Svetlana Boym, “Ruins of the Avant-Garde” in Julia Hell, Andreas Schönle (eds.), *Ruins of Modernity* (Duke University Press, 2010), 63

These images have been used in the texts of architectural historians, and with the help of these visuals, the tower is still being reproduced by different groups, both physically and digitally. These second-order works have reached more people utilizing photographs and directly increased the popularity of the original model photographs. For example, in 1971, Jeremy Dixon reconstructed the model of Tatlin's Monument for the exhibition "Art in Revolution" of the London Hayward Gallery. It is stated that "more model reconstructions of the tower are made for other museums: the Moderna Museet in Stockholm, the Tretyakov Galerie in Moscow, the Musée National d'Art Moderne in the Centre Georges Pompidou as well as the Royal Academy of Arts in London."⁹⁷

The applicability of the Tatlin tower has been a controversial issue since it was first conceived in 1920. The 'Unbuildable Tatlin' seminar was held in 2009 at the University of Applied Arts, Angewandte Vienna, to question whether this tower would be built with its basic components. At the end of this seminar, it was concluded that the tower could be applied with minor changes. The structural test of the tower was applied by the program called RTSAB (Real-Time Services AB). Model photographs were used to recreate the tower's optical features and foundational ratios.⁹⁸

Haluk Zelef draws attention to the model photographs of Vedat Dalokay's *Kocatepe Mosque* (Figure 3.7) as they have created a similar effect as the photographs of Tatlin's Tower.⁹⁹ Dalokay won the architectural competition for a mosque on the hill of Kocatepe in Ankara in 1957. The construction started in 1963, but there appeared problems with the structural stability of the dome in the project. Besides, some

⁹⁷ Atli Magnus Seelow Chalmers, "Models as a Medium in Architecture", Preprints 2017, 2017120071 (doi: 10.20944/preprints201712.0071.v1)

⁹⁸ Klaus Bollinger, Florian Medicus, *Unbuildable Tatlin?! (Birkhauser: Wien, Austria, 2012)*, 102-8

⁹⁹ Haluk Zelef, thesis discussion.

groups rejected the modern design of the mosque, and the disagreement turned into political conflict. In the third competition, the conservative project of Hüsrev Tayla and Fatin Uluengin won, and the construction started in 1967. Later, Vedat Dalokay had won the international competition of King Faisal Mosque in Islamabad with a similar, modern design in 1973, and the building was completed in 1986.¹⁰⁰ Kocatepe Mosque had become a symbol of the changing politics in Turkey, and the model photographs had been extensively disseminated in media.



Figure 3.7 Poster of Mosque Construction Association, Kocatepe Mosque model photograph. Architect: Vedat Dalokay

¹⁰⁰ Digital newspaper archive:
<http://gazetearsivi.milliyet.com.tr/Ara.aspx?araKelime=kocatepe%20cami&isAdv=false>, Interview with Hüsrev Tayla: <https://www.arkitera.com/soylesi/kocatepe-camisini-yaptim-ama-bu-hicbirinin-kopyasi-degil/>

3.2.2 Freezing the Moment

Photographs translate the 3d space of the objects into 2d photographic imagery. This translation is the same for the models, and there can be some losses and gains during this process.¹⁰¹ The primary advantage of the model is that it is a three-dimensional medium which is understandable for everybody, even for those who do not specialize in architecture. It has an undeniable charm with its miniature scale, the abstraction of materials and details, which creates an impression of total control over the whole project. It is possible to catch unnoticed relations of spaces, even for its designer.

Translation to 2d imagery reverses this effect. This time the photograph takes control of what can be viewed and what cannot. The impression of totality is lost. If the model is not pictured from different views, most of the information presented by the model gets lost. Therefore, it can be said that the translation of the model to 2d imagery has features that can be regarded as useful or restrictive according to the purpose of the user. The ability to control the viewer's gaze can highlight the desired effect or distract from essential issues at the same time.

The photographer has control over the viewpoint of the photograph, and at the same time, he/she can freeze the time with the click of the shutter. The photograph prolongs the model's life in this way. It also helps to document the design process of the modelmaking; the sequence of different phases can be meaningful for the architect. It also becomes possible for the immaterial turn into the material by photography. The smoke, the light, the shadow can become the body or a part of the model. Scenographers of the theatre can work on light, color, and fog effects on the stage with the help of model photographs. The freezing moment is also useful for the

¹⁰¹ Pelin Yoncacı Arslan, Panel, "Mimarlık Arşivinde Maketin Yeri" for "Düşünme ve Görselleştirme Aracı Olarak Türkiye'de Mimari Maket" exhibition.

recording of the necessary data in experimental models. In physical simulations, the photograph and the video turn into a necessary tool for the recording of the event.

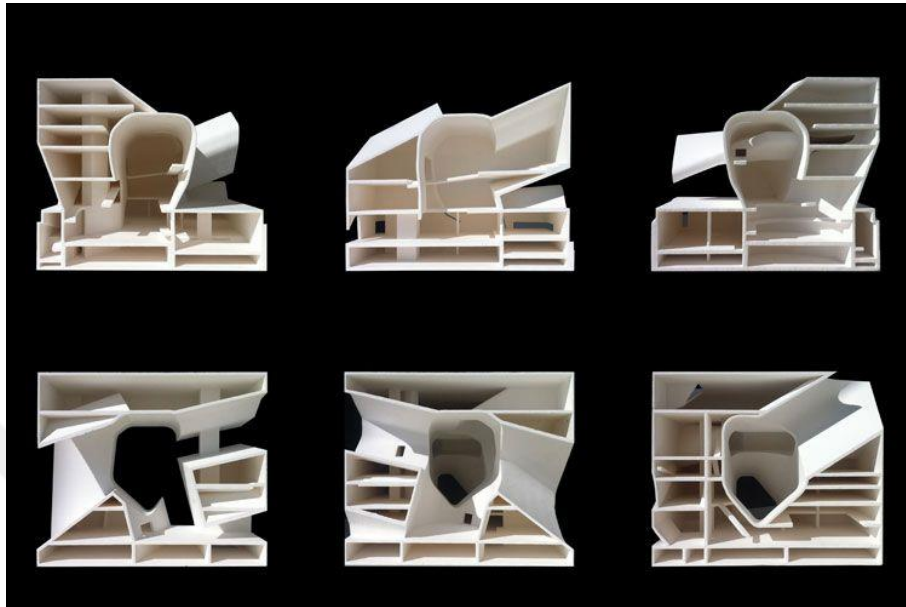


Figure 3.8 Study of light on model photographs. Architect: Steven Holl. Project: Tianjin Ecocity Ecology And Planning Museums, 2012.

The examples of model photographs (Figure 3.9, 3.10) are from the book *House X* by Peter Eisenman.¹⁰² *House X* is an unbuilt project with 13 studied schemes by the architect. The project was well documented to be used in publications, and now these documents are in the archives of CCA (Canadian Centre for Architecture). In the book dedicated to this project, Eisenman effectively uses model photographs, drawings, and text to describe the process of design. In the last pages of the book, there are photographs of a distorted model, which can be seen as a 3-d meaningful model from one viewpoint. Only one of them shows the model in the axonometric view, but the other photographs reveal that it is an example of an anamorphosis.

¹⁰² Peter Eisenman, *House X* (Rizzoli, 1983)

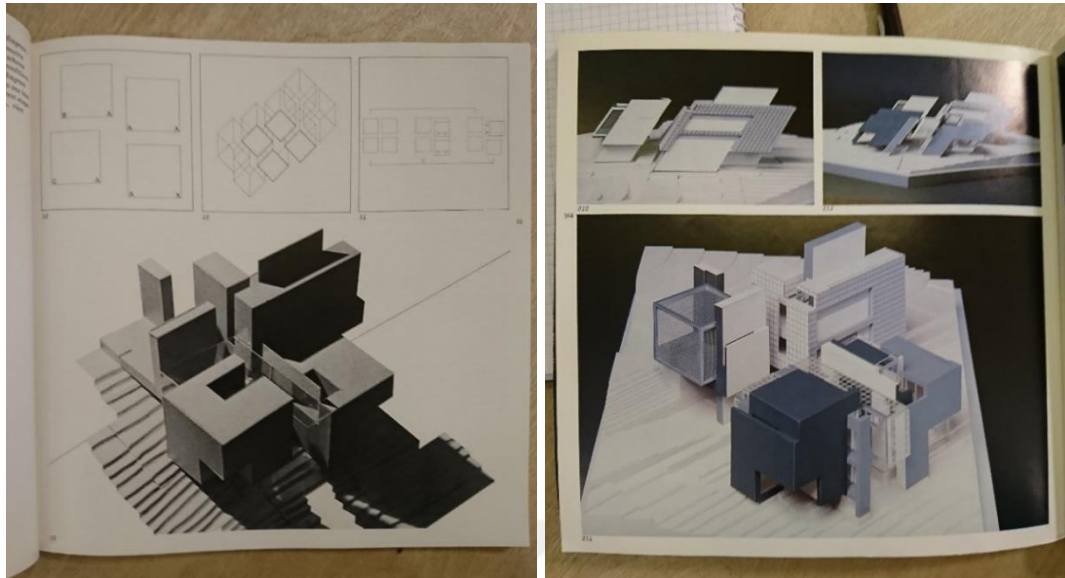


Figure 3.9 Left, Model photo example from the book, House X / Peter Eisenman

Figure 3.10 Right, Distorted model photo example from the book, House X / Peter Eisenman

In the catalog of the exhibition, ‘Model as Idea,’ Eisenman says that the “model of a building could be something other than a narrative record of a project or a building.”¹⁰³ In House X, the model is the final product and can be regarded as an autonomous object, according to Eisenman’s view. Modeling and taking photographs becomes a strategy for design to study the process of ‘Decomposition.’ Following paragraphs explain the purpose of the architect:

The motivation behind the development of the axonometric model in House X was that the model could not be appropriated in a conventional way if it was regarded as the reality. What Eisenman wants to highlight is the distinction between a model and a drawing. [...] Not only is there better visibility granted through the model in comparison to drawing, but there was an important mobilization, which simply stated is the claim that the drawing has a fixed point of view, while you can walk around the model.

Eisenman insists that in the model of House X the monocular view at 45 is the only way of seeing the reality which the model possesses. You are forced

¹⁰³ Peter Eisenman, “Preface” in Kenneth Frampton and Silvia Kolbowski, *Idea as Model*. Institute for Architecture and Urban Studies: Rizzoli International Publications, 1981, 1.

into this view, which only a camera can achieve, and with the photograph (in this case, the ultimate reality), it is transformed from a model into a two-dimensional representation.¹⁰⁴

3.2.3 Abstraction

The process of translation to 2d imagery has similarities with architectural photography. Andrew Higgott and Timothy Wray, the editors of the book, *Camera Constructs*, say that “Human eye is very good at evaluating and prioritizing information, whereas the camera is not selective and registers everything uniformly.”¹⁰⁵ It is a reasonable criticism of the monocular view of the camera. The visual effect of the camera is very similar to human sight. The experience of the stereoscope, 3d cinema, or virtual reality may be more qualified to mimic binocular vision. However, the abstraction of the content through the act of photography simplifies its perception, and this is one of the notions which increases its popularity. Walter Benjamin wrote about this in his forerunner essays in 1931 and 1936:

“Everyone will have observed how much easier it is to get the measure of a picture, especially sculpture, not to mention architecture, in a photograph than in reality. [...] [Great works of art] can no longer be seen as the productions of individuals; they have become collective formations of such enormous dimensions that their assimilation is dependent precisely on their diminution. The result of the mechanical methods of reproduction, ultimately, is to have provided a technique of diminution which helps men to a degree of control over works of art without whose aid they could no longer be used.”¹⁰⁶

Benjamin attributes the effect of diminution to “the loss of aura” during the process of reproduction. This concept of diminution can be further described as ‘abstraction.’ The process of abstraction is crucial in analyzing the effect of photography on architecture in full terms. The effect of reproduction and dissemination is apparent,

¹⁰⁴ Patrick Healy, *The Model and its Architecture*, 56-7

¹⁰⁵ Andrew Higgott and Timothy Wray (eds.), *Camera Constructs*, 8.

¹⁰⁶ Walter Benjamin, *A Short History of Photography*, (1931), 23

but to fully understand photography's role in modernism, how the concept of abstraction infiltrated into architecture and photography and how they acted together in this process should be investigated.

The Ph.D. Dissertation of Claire Zimmerman analyzes the role of photography in architecture in the high time of modernism by the photographs of the early works of Mies van der Rohe from the Weimar period. She researches how the concept of architectural abstraction was achieved in this period, and how the photograph played a role in this process. She differs architectural abstraction from painterly abstraction. The concept of abstraction was well researched by the painters at the beginning of the 19th century, architecture and photography began to study abstraction during the 1920s and 30s, although they had led different paths.

Before the 2nd world war, architects were using the concepts of internationalism, autonomy, and functionalism to explain their design processes. Only after the war, the concept of abstraction began to be used. Zimmerman exemplifies Malevich's "Architekton" and El Lissitzky's "Proun" as the first attempts for the development of abstraction in architecture. However, she does not evaluate the photographs of these models accordingly.

Zimmerman uses the definition of abstraction, which means "a process of reduction of / essentializing information" for the discipline of architecture. Photography transforms architecture as it hides some of its features, while it reveals other features. The photograph reduced the information level, but it provided a medium for architecture to reach a wider audience. Therefore it somehow began to represent architecture more than the original building. At the same time, architecture could get into close contact with other forms of art, with the help of photography.¹⁰⁷

¹⁰⁷ Claire Zimmerman, "Modernism, Media, Abstraction: Mies van der Rohe's Photographic Architecture in Barcelona and Brno (1927-31)", (Unpublished PhD Thesis, The City University of New York, 2005)

Trends towards abstraction have also been observed in model making in architecture. The potential of the model to reflect the architect's conceptual ideas started to be exploited, especially in the 1960s and 70s, and this trend may have reached its highest point in the 'Idea as Model' exhibition in 1976. This kind of model is called study, sketch, design-development, or concept models. Moon emphasizes the role of this model in practice as follows, "[...] the trend towards abstraction has positioned the model at an increasingly elemental level in the creation of architecture, allowing it to convey the architect's underlying vision in all its primal power."¹⁰⁸

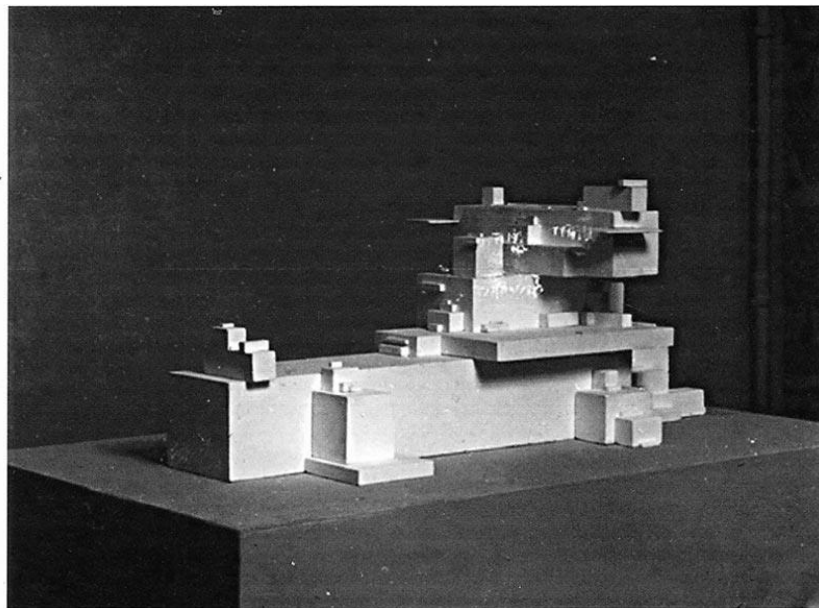


Figure 3.11 Kasimir Malévitch, Alpha, Arkhitektons (1923)

Photographs of abstract models have been advantageous in terms of being transformed into quality images and been used extensively to express ideas in architectural practice. However, the concept of abstraction mentioned in this section is mainly achieved through the medium of photography. In fact, the model usually eliminates and compress information during the process of miniaturization. The model's transformation to imagery duplicates this effect.

¹⁰⁸ Moon, *Modeling Messages*, 77

In this part, the effect of abstraction in the model photograph will be evaluated with the help of the canonical black and white photographs of the modern movement. The role of these photographs in the construction of Modern Architecture has been well established through cases. Model photographs can be seen as part of this heritage. In every context where architectural photographs were published, model photographs accompanied them. This may be due to the fact that it was the preferred form of display when the project was not built. On the other hand, architectural photographs and model photographs had similar characteristics in terms of their effects. In this period, "record" style photos, which aim to provide the most information, were frequently used in publications.

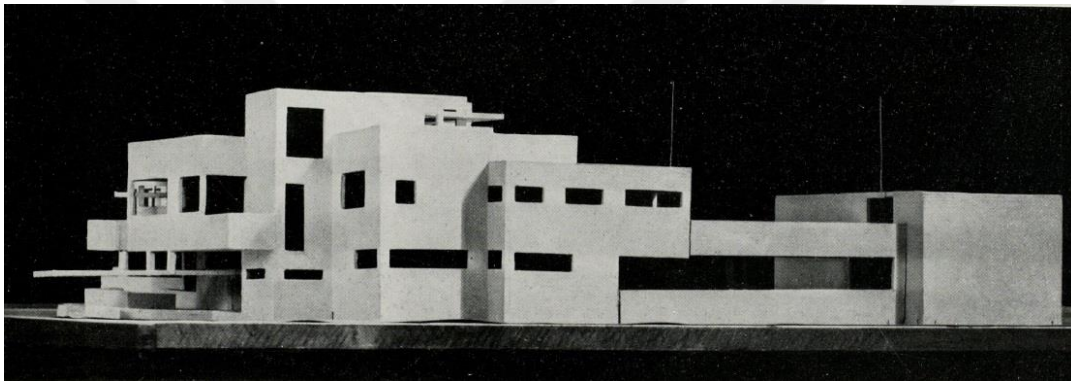


Figure 3.12 Model photograph of 'House in concrete, iron, glass' by Theo van Doesburg and C. Van Eesteren, Holland. (1923)

Source: Walter Gropius and Lazslo Moholy-Nagy, *Internationale Architektur*.

These photographs were taken at an angle to show at least two sides of the building, the mass being comprehensible. Model photographs were also taken with a similar approach. Both architectural and model photographs were showing the building with a composition of light and shadow, expressing the formal and symbolic approach of modern architecture in a similar way.

The book, *Internationale Architektur* (International Architecture)¹⁰⁹, is the first book in the Bauhaus book series and presents examples of this newly defined architecture with different visual media. In the book, architectural photographs are documentary

¹⁰⁹ Walter Gropius and Lazslo Moholy-Nagy, *Internationale Architektur*, (Munich: Langen, 1925)

in style. In the absence of the architectural photographs, plan, elevation, perspective, and axonometric drawings and model photographs were used. Although being different display techniques, it can be said that they were aiming to express the universality and monumentality of Modern Architecture in a clear and objective manner. Although the artificiality of the models was easy to understand in the model photos, the combination of architectural photos with them did not create a diversified feeling.

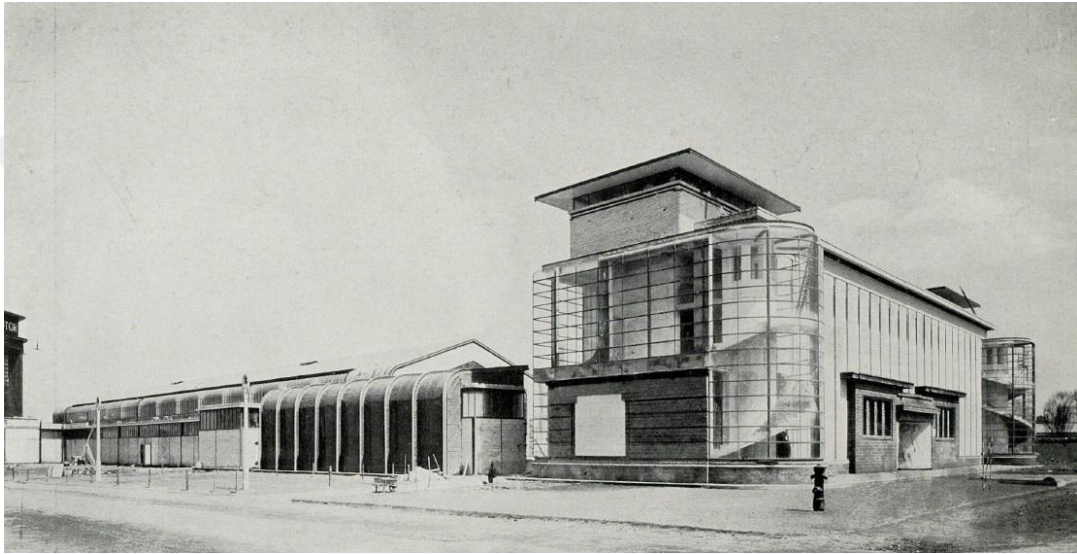


Figure 3.13 Walter Gropius, Dessau, Anhalt. Office building and factory at the Werkbund exhibition, Cologne. Iron, Glass, Limestone.

Source: Walter Gropius and László Moholy-Nagy, *Internationale Architektur*.

3.2.4 Objectivity vs. Fiction

A model photograph is a photograph at first hand. It bears the intrinsic features of the photographic image, which is the product of an optical and mechanical tool, ‘a camera’ produced and used by man. Fundamental theories about photography are already applicable to model photography. The features of architectural photography have been frequently examined both in the theory of photography and architecture. The prominent feature of the photographic image is its claim on objectivity and truthfulness. In this part, the prolonged discussion about photography’s claim of

objectivity will be summarized, and then the complicated relationship of model photography with actuality will be argued.

Before the camera, the image was created by the intervention of hand such as painting, mosaics, lithography. The entrance of the camera increased the confidence in the actuality of the image. The word “Photo-graph” derives from the analogy of *writing with light* because it is created by light falling on a light-sensitive surface.¹¹⁰ If someone was recorded in the photograph, then he/she must have been real and stood in front of the camera at some time.¹¹¹ This observation explains the notion of causality – the indexicality -, a feature of the photography. The index is a special kind of sign which has a direct causal link to the referent, like a footprint or a shadow.¹¹²

Contrary to the claim for the realism of photography, both the technical boundaries of the camera and the effects of its use by human, made it a medium of representation. The act of taking pictures involves personalization with different preferences of selection and framing the subject. Cameras with different techniques had direct influences on the end product of the camera. From the very beginning, “manipulation” and “retouch” were demanded, as photography also includes the social history of the man who searches for alternative uses of the medium.

The extensive use and sometimes abuse of photography decreased confidence in the objectivity of the medium. The photographic image began to be regarded as a construction. It became a theoretical object in the writings of Roland Barthes and Jean Baudrillard in the 1960s.¹¹³ Roland Barthes’ reading of the photographic message, Baudrillard’s simulacrum, were essential concepts for analyzing

¹¹⁰ Definition of photography in Encyclopedia Britannica, <https://www.britannica.com/search?query=photography>, [last accessed on 06.01.2020]

¹¹¹ Liz Wells. *Photography: A Critical Introduction*, (Routledge, 1997), 17

¹¹² The definition of Charles Sanders Peirce, Daniel Chandler, *Semiotics: The Basics*

¹¹³ Rosalind Krauss, “Fotoğrafi Yeniden Keşfetmek”, in *Fotoğraf Ne Anlatır?*, 52

photography. Susan Sontag put that the photograph is “not only an image, an interpretation of the real; it is also a trace, something directly stenciled off the real, like a footprint or a death mask”¹¹⁴ She adds that man widely uses photography for beautification, and uses the term “photogenic” which she later acclaims that it is the proof that photograph is not a truthful copy of the real.¹¹⁵

Briefly, photographic images can be both objective and subjective at the same time. John Berger defines this intrinsic feature of photography as follows: “Are the appearances in which a camera transports a construction, a human-made artifact, or are they like a footprint in the sand, a trace naturally left by something passed? The answer is both.”¹¹⁶

Davide Deriu explains that model photography has not been in the focus of architectural research, and the role of the photographic image in model photography has not been revealed in detail yet.¹¹⁷ In the following paragraph, he points out to the complicated relationship of modeling and photography:

Born out of the encounter between two distinct media, this hybrid imagery combines the evidentiary force of photography with the fantasy world of models, thus achieving the paradoxical realistic representation of a virtual environment. The most obvious implication of this process of intermediality is that a solid object is reduced to the flat surface of a picture. Once the model is framed by the camera, it enters a different field of perception, where its original properties of form, texture, and scale are reconfigured.¹¹⁸

According to this diagnosis, the first concept for the analysis of model photography is the opposition between the documentary feature of photography and the imaginary feature of modeling. Model photography is distinguished as a medium of

¹¹⁴ Susan Sontag, “The Heroism of Vision”, in *On Photography* (Penguin, 1979), 154-5.

¹¹⁵ Ibid, 85.

¹¹⁶ John Berger, *Understanding a Photograph* (Aperture, 2013), 92

¹¹⁷ Davide Deriu, “Transforming Ideas into Pictures: Model Photography and Modern Architecture” in Andrew Higgott and Timothy Wray (eds.), *Camera Constructs: Photography, Architecture and the Modern City* (Ashgate, Farnham, 2012), 159-60

¹¹⁸ Ibid, 159-60

representation in double layers. The act of modeling abstracts architecture in differing ways to gain control over it. Photography is also a way of abstracting vision; therefore, model photography becomes a double-layered form of representation.

Besides, the photograph can highlight or obscure certain features according to the intention of the photographer. He/she can control the camera by framing the desired scene and expelling its surrounding context out of frame. The perception of a model photo taken with human reference in real space and a model photo with an entirely framed model is different. The lack of context causes misrepresentation of scale. Davide Deriu explains the effect of this scalar ambiguity in more detail:

This pursuit of realism took advantage of the photograph's capacity to frame a miniature universe of its own, thereby exploiting -and amplifying- the verisimilitude of the model. A distant relative of the Trompe l'oeil technique, this optical illusion alerts us to a use of photography that emerged in contradistinction to the modernist attitude outlined above. Here the agency of the camera was mobilized not to evoke an abstract design concept but rather to lure the viewer into an imaginary world where a story might unfold.¹¹⁹

The concept of trompe l'oeil is very illuminating to explain this complicated status of representation. In art history, trompe l'oeil defines the mistaking of an image with reality. If the setting is suitable, there follows the revelation of the deception when the viewer realizes that it is originally a representation. Caroline Levine writes that “[...] trompe l'oeil is, therefore, the critical art par excellence. First, by duplicating the experience of the real and then declaring its status as an artifice, the work of art insistently calls our attention to the construction of the illusion. Trompe l'oeil, consummate art of verisimilitude, thus marks both the quintessence of realism and its impossibility.”¹²⁰

¹¹⁹ Davide Deriu, “The Architectural Model in the Age of its Mechanical Reproducibility” in in: Heynen, H. and Gosseye, J. (ed.) Proceedings of the second international conference of the European architectural history network, 167

¹²⁰ Carole Levine, “Seductive Reflexivity: Ruskin's Dreaded Trompe l'oeil”, The Journal of Aesthetics and Art Criticism, 56:4 (Autumn, 1998), 374, <https://www.jstor.org/stable/432127>, [last accessed on 06.01.2020]

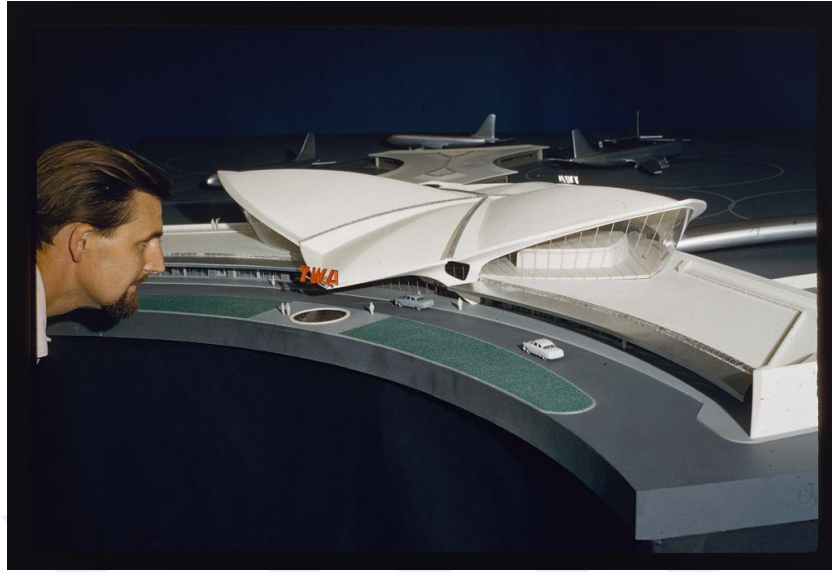


Figure 3.14 Balthazar Korab with TWA (Trans World Airlines Terminal) model.
Architect: Eero Saarinen

Source: <https://www.loc.gov/pictures/item/2018672853/>



Figure 3.15 Trans World Airlines Terminal, John F. Kennedy Airport, New York, 1956-62. Model. Architect: Eero Saarinen Photograph: Balthazar Korab

Source: <https://www.loc.gov/pictures/collection/krb/item/2018673403/>

In the images (Figure 3.14, 3.15), the photographs of models taken by Balthazar Korab show different attitudes for models. In the first one, a model is an object with the reference of a human being, this time its photographer, Balthazar Korab. In the second one, the model begins to represent space, and even it is now possible to mistake it as an architectural photograph if the viewer does not pay attention to details.

The element of deception and trickery enters the image when the space of the model gets confused with the space of the referent architecture. The signifier, the photograph seems to show the John F. Kennedy Airport as the signified. In fact, the photograph only refers to the model of the original building. It can be compelling for its client to see the purpose of the architect shaped in flesh and bones before the project gets built. The photograph becomes a tool for building an imaginary world. This perceived space is somehow similar to the virtual space of digital modeling renderings.

3.3 Imitation of Architectural Photography

The models have always aroused interest in people to imagine them as they were real. Jane Jacobs, explains early experiments for visualizing models in an article dedicated to models.

To get the illusion of looking at an actual full-size project, instead of a miniature, there are two old devices, surprisingly little known. One is simply a piece of metal foil – a candy wrapper is fine – with a tiny view hole pierced in it. The foil blinder blocks off the view of the model's full-size surroundings, and presently the viewer accepts the model as being full size itself; the principle is the same as that used by marionette showmen. The other device is a sort of reverse periscope, with the opening for the image at the bottom, where the eye level of a little man in the model would be. "All you need for it," says Modelmaker Salmon, "is two mirrors and a Nabisco box."¹²¹

¹²¹ Jane Jacobs, "Miniature Boom", 196.

In the next paragraph, Jacobs explains the use of reducing glass, which gives an opportunity for the modelmaker to detect the overall look of the model. With this method, a large model can be perceived as a small model through the reducing glass. The dates of these methods are not given, but it is not surprising that there were alternative methods other than the use of the camera for the visualization of models.

Photographers have tried to visualize models from different views. The viewpoint of the camera can change the overall composition of the model photograph. The bird's eye view was the most used viewpoint at the beginning of the century, as there were technical obstacles to get close to the model. This view was similar to the oblique view and the aerial view, which were popular among architects at the time. The bird's eye view turns the model into an object. When the model is photographed with people, the state of being an object gets emphasized. The photograph can turn into a documentary image that depicts the relations between the model and the people. In the mid-century, new cameras were able to get close to the model. From this viewpoint, the model photograph began to look like an architectural photograph. It was now possible for the non-architect to visualize a non-existing place in perspective. As the cameras got technically more qualified, physical simulations became a tool for the architects and the engineers.

'Modelscope' is the term used for the technique of visualizing architecture from the viewpoint of the man walking in the model as if it was 1/1 in scale. This type of camera is similar to the endoscope. Modelscope is formed of "a tube fitted to the camera at one end, with an angled mirror at the other" and invented after the Second World war. Its adaptation to video and film was called the 'snorkel camera.'¹²² These techniques were convincing when they were used for the persuasion of the non-architects.

¹²² Moon, *Modeling Messages*, 68

3.3.1 Photomontage

Photomontage was not a new method when architects began to combine model photographs and real site photographs. Avant-garde artists - Dadaists, Constructivists, and Surrealists were already using the photomontage technique in the 1920s. The adaptation of this technique to model photography was successful both graphically and products that would enable people to perceive the models from different angles. There have been abstract and graphic examples of this technique, as well as more realistic examples.

Kazimir Malevich's "Project for a Suprematist Skyscraper" (Figure 3.16) combines a photo of an Architekton with a photo of New York's skyscrapers and plays with the audience's perception of perspective. The abstract model can be regarded as a visual manifesto in contrast to the neoclassical style of early skyscrapers. Another avant-garde artist, László Moholy-Nagy, gives a clue about the intended use of photomontage in that period in the following paragraph. The work of Malevich can also be analyzed from this perspective.



Figure 3.16 Kazimir Malevich, Architekton in Front of a Skyscraper, 1924

Superimposition of photographs, as frequently seen in motion pictures, can be used as the visual representational form of dreams, and in this way, as a space-time synonym. The photomontage, a device often used in advertising, has a very similar technique. The cutting and assemblage of the parts is applied here on a static plane. The effect is that of a real scene, a synopsis of actions, produced by originally unrelated space and time elements juxtaposed and fused into a unity.¹²³

Mies van der Rohe was one of the early users of the realist type of photomontage. Mies combined model photographs as well as perspective drawings to see how the project would look like in the site when it gets built.¹²⁴ Karen Moon says that this technique was used by professional photographers in the 1970s and gives the example of the World Trade Center in New York. Moon says that this method was very expensive in that period, but still very effective for convincing investors. For example, in 1989, the cost of such model photos could reach \$1 million with the wages of modeling, photography, computer retouching, and the sales brochure.¹²⁵

In the case of the World Trade Center, the photomontage had a share in the commercial success of the project. Moon adds that, even after the construction, the photomontage was still used for the promotion of the building. This commercial success must have set the standards for the images of similar projects. It can be estimated that the digital models and their visuals that are developed today have been affected by the visual standards of the model photographs in that period.

Akiko Busch wrote about professional photomontage in 1992, and she said that the main purpose of these photographs was to “glamorize a building by accentuating specific features to market it to planning boards, leasing agents, and potential tenants.”¹²⁶ She gives details about the technique and the artistic preferences for

¹²³ László Moholy-Nagy, *Moholy-Nagy*, (Praeger,1970) 63.

¹²⁴ Martino Stierli. *Montage and the metropolis: architecture, modernity, and the representation of space* (New Haven : Yale University Press, 2018)

¹²⁵ Moon, *Modeling Messages*, 118.

¹²⁶ Akiko Busch, “True or False: Model Photography Is High Art” in *Architectural Record*, v.180, n.5, 1992, 34-36.

increasing the effect of the photomontage. At the end of the article she warns the viewer to be careful with this type of image: “While computer-generated composite photography of models may give us intriguing glimpses into the unbuilt world, the viewer must also keep in mind that this is a hybrid landscape, composed of actual and imagined objects. Here is the architecture of fact and fiction.”¹²⁷



Figure 3.17 Photomontage of Minoru Yamasaki's World Trade Center model and its site with adapted foreground, 1969.

Source: Karen Moon, *Modeling Messages*, 118

3.3.2 Simulation

Model photography has been used in different ways, thanks to the advances in technology and the development of design techniques in architecture. The model's ability to present and reproduce artificial environments, as mentioned above, allowed the model photographs and videos to be used for simulation. Simulation is a design and experimentation method in architecture which is not restricted to computer-

¹²⁷ Ibid

generated environments, and it has been extensively evaluated in philosophy. The concept of ‘simulation’ is rather complex; therefore, in this study, the relationship of model photography with simulation as a design method will be investigated briefly.

To understand the meaning of ‘simulation’ and its change in the 20th century, an excerpt from the book, *Simulation: Pragmatic Construction of Reality*, will be given:

The word ‘simulation’ comes from the Latin *simulare*. For almost three centuries, the principal lexical meaning of simulation in the English, French, and German languages referred to ‘imitation’ or, alternatively, to ‘deception.’ [...] The meaning of the term simulation changed after World War II, as the definition given by the Oxford English Dictionary (fourth edition 1989) reflects: “The technique of imitating the behavior of some situation or process (...) by means of a suitably analogous situation or apparatus, especially for the purpose of study, or the training of personnel.”¹²⁸

Further, another book, *Architectural Research Methods*, clarifies the difference between terms ‘simulation’ and ‘representation’ as follows:

The word representation often occurs, with various shades of meaning, in the simulation literature. For our purposes, representation denotes a fixed image that stands for a real object because the image has measurable qualities that describe and depict the real thing. In this sense architectural drawings are representations. Photographs, the medium that much of architectural education has been dependent upon up to now, are also representations under this definition. To-scale three-dimensional architectural models are representations as well. It is only when data from various scenario inputs can be generated from representations that we can say simulation is taking place. This can be achieved with fixed representations.¹²⁹

In contemporary architectural practice, it is necessary to analyze more data, to collaborate with more design groups, and to convince the clients that the project is risk-free. In the increasingly complex design process, simulation becomes a functional tool, especially for engineering issues. It can be said that the advantages of the simulation are that it solves the problems economically and quickly in a risk-

¹²⁸ Günter Küppers, Johannes Lenhard, And Terry Shinn, “Computer Simulation: Practice, Epistemology, and Social Dynamics” in *Simulation: Pragmatic Construction of Reality*, Springer, 2006, 3.

¹²⁹ Linda Groat and David Wang, *Architectural Research Methods*, Wiley; 2 edition, 2013, 356-7

free environment, creates a measurable experiment environment, and allows to compare different solution by allowing reproduction. Its disadvantages include being a costly method and requiring accumulation to be technically competent, whether physical or digital.



Figure 3.18 A page from the book, *Umweltsimulation: Sensorische Simulation im Stadtebau* by Antero Markelin and Bernd Fahle, 131.

Analog model simulations were used in many countries, including the United States, Britain, Holland, Sweden, and Germany in the 1970s.¹³⁰ A book about the simulations made for the experiments in urban planning was very useful to evaluate its importance in architecture. This book explains that the general method for making simulations was first abstracting the parts and elements of a complex system and then making them accessible to a controlled scientific study. It was aimed to grasp not only individual elements of a system but their regular relationships, order, and structure in a simulation of the system. Simulation is therefore regarded as a process in which the essential elements and structures of a real system are represented. In

¹³⁰ Rolf Janke, *Architectural Models* (Academy Editions: London, 1978), 146.

other words, the simulation does not depict the real system in its entirety, but rather reflects the aspects which are essential for a particular purpose of investigation.¹³¹

In the book mentioned above, it was aimed to produce environmental sensory simulations to evaluate the quality of the future resident's perception and experience in the simulated environment. Similarly, tests that measured data such as light and sound on building models were defined as simulations in the past. An example of the contemporary use of physical models for simulations can be given from Turkey.

In Coastal and Marine Engineering laboratories of the METU Civil Engineering Department, experiments are conducted to examine the behavior of water waves on physical models. These experiments are recorded with photos and videos, and these photos are used for scientific measurements. Cüneyt Baykal, from the laboratory, describes two different models of models.

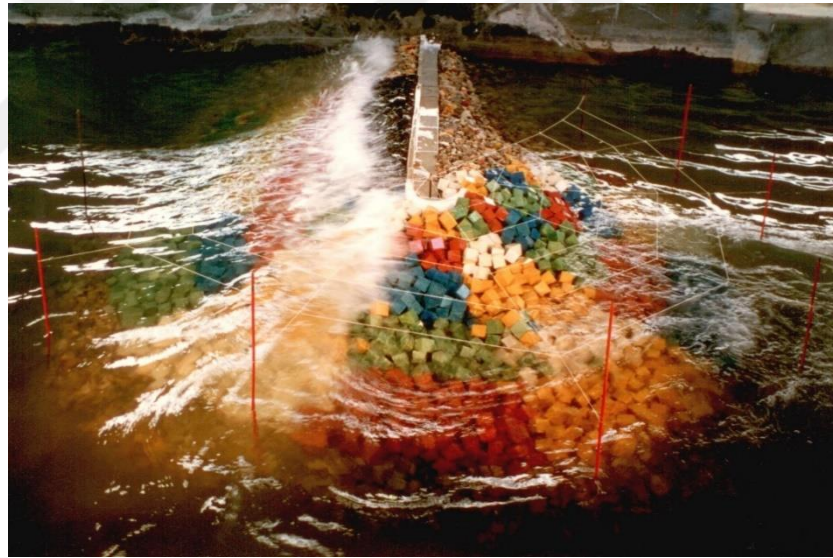


Figure 3.19 Photograph of an experiment in Coastal and Ocean Engineering Laboratory, Civil Engineering Department, METU.

Source: Archive of Coastal and Ocean Engineering Laboratory, METU. Shared by Asst. Prof. Dr. Cüneyt Baykal on 22.03.2019.

¹³¹ Antero Markelin and Bernd Fahle, *Umweltsimulation: Sensorische Simulation im Städtebau* [Environmental simulation: sensory simulation in urban planning], Kramer, 1979.

A small scale model of a port is made in large pools to study the effect of the water. Waves are created in the pool filled with water, and the amount of turbulence in stormy weather is measured on these models. In another type of model, a cross-section of a breakwater is modeled between two glass partition walls, so the behavior of the wave on the breakwater can be viewed from the sides. Water movements can be measured on these photos by photogrammetry methods. Thanks to the before and after photos, the damage caused by the wave can be detected, as in the case of a tsunami.¹³²

The computer technology developed over time and provided more economical and faster environments for simulations. The simulations were transferred to the computer environment, as the applications developed for the computer proved their accuracy. Currently, model experiments, such as evaluating the effect of fire on building parts or observing the behavior of water waves on breakwaters, are still carried out physically. However, with the development of calculation methods, such studies can be expected to go digital. Today, it is not surprising that the concept of simulation is considered to be synonymous with computer-based environments.

3.4 The Model and its Image After Digital Technologies

Before dealing with the concerns that the digital model images have created, an anecdote of James Ackerman will be given to discard both the admiration and rejection they have created in societies. Ackerman, in his article about architectural photography, talks about two basic principles for the modes of representation:

First, that modes of representation are not significantly altered when new techniques are discovered but perpetuate preexisting conventions and second, that representation itself is not a reflection of some “reality” in the world about us, but is a means of casting onto that world a concept – or subliminal sense – of what reality is.¹³³

¹³² Interview with Cüneyt Baykal, Ankara- 22.03.2019.

¹³³ James Ackerman, “On the Origins of Architectural Photography” in Kester Rattenbury (ed.) *This is Not Architecture, Media Constructions* (Routledge, 2002),

Following the two principles that Ackerman defines, this thesis suggests that the practice of model photography has some common properties with digital model images. The purely digital image is very different from the photographic image on ontological, informational, and representational levels; in fact, scholars define conceptual shifts for the transformation of computerization in the world. Still, there can be seen similar patterns in their use as they are bound to the perception and utilization of man; it does not matter that much how different technologies they belong.

The purpose of producing model photographs is very similar to producing digital images as in the example of “solving the problem of salesmanship.” The ability to foresee and evaluate the projects during the design phase is a desire both for the architect and the builder, and it is nearly the same desire in the 19th century and the 21st century. It can be said that the procedure of salesmanship is similar in two eras as they represent pre-mature and mature forms of capitalist societies. The evolution of the imaging of “not built yet” is linear in terms of productivity and cost. The first photographic montages of models in the existing environment were expensive and had a complicated production process that only a few architects could afford in the past. With the introduction of computers, it consistently got easier to produce realist images in shorter durations, and also, they can be produced by all of the architects who can afford the necessary equipment and knowledge.

3.4.1 Model’s Virtual Space

The history of the advent of digital environments dates back to the 1960s.¹³⁴ However, people had to wait until the 1990s when it could be used in full terms in

¹³⁴ The technology of drawing in computational systems was developed as early as the 1960s. The current technology was mainly based on the Sketchpad system, which was presented in a conference in 1963. Sketchpad contained CAD systems, and one of them was the interactive 3D CAD system, based on Timothy Johnson’s 1963 MIT MS thesis. The work on VR was developed by Ivan Sutherland at Harvard University between 1965-1968. (Brad A. Myers, “A Brief History of

architectural practice.¹³⁵ There were some difficulties in switching to the computer in professional use. The technological equipment required in the first place was both expensive and insufficient to catch up with real-time. Afterward, the software to be used on the computer was insufficient to perform the necessary functions, and the lack of people trained in this issue was a drawback. Time was needed to overcome these troubles.

The motivation for the development of such technologies was that they were offering fast and affordable services instead of expensive and impractical manual labor. Virtual environment technologies provided an excellent potential for the development of research carried out on the field of architecture. Virtual environments can be defined as 3D, non-physical environments that allow interaction via a computer. This environment provided the opportunity to create both static and dynamic simulations by imitating complex physical environments.

According to the dictionary, “virtual” is an adjective used to “describe something that can be done or seen using computers or the Internet instead of going to a place, meeting people in person, etc.”¹³⁶. In daily life, the term ‘virtual’ is sometimes used as the opposite of ‘real.’ This approach is misleading for the position of virtuality in relation to reality. In order to define this relationship, a paragraph will be given from a thesis which deals with the transformation of the architectural model from physical to virtual:

Human Computer Interaction Technology”,
<https://www.cs.cmu.edu/~amulet/papers/uihistory.tr.html>, [last accessed on 06.01.2020]

¹³⁵ CAD systems began to be used in architectural firms in the 1990s, mostly for the purpose of 2D drafting. It took some time for personal computers to become practical and affordable. There were several earlier commercial, personal computers, but the first practical, mass-market machine was the MITS Altair, sold as a \$397 kit in 1975. This computer was able to perform word processing, file management, and run Basic and Fortran with additional hardware. The first commercial CAD program was T-square, which was developed in 1978. AutoCAD came onto the market in 1992, and by the mid-1990s, nearly 85% of architectural firms owned AutoCAD licenses in the USA, even if they also used other CAD programs. (Larry Press, “Before the Altair: The History of Personal computing” in *Communications of the ACM* (September 1993), 36:9)

¹³⁶ <https://dictionary.cambridge.org/dictionary/english-turkish/virtual>, [Last Access on 27.01.2020]

[Bergson] argues that, contrary to the common conception, the “virtual” belongs to “reality,” but a reality which is not “actualized.” In other words, the virtual can be actualized by a materializing action. Within this context, the virtual is not the antidote of the real, but the actual, and these three acts in a simultaneity. In this scope, the virtual becomes a situation full of potential for future realizations and allows a multiplicity of viewpoints and becomings. In parallel, Deleuze accepts this theoretical position, and proposes the notion of the “diagram” and the “abstract machine,” which are correspondent of the virtual situation in Bergsonian philosophy. The Deleuzian diagrammatic abstraction is conceived as a virtual entity, which possesses a potential for multiple generations in its actualization.¹³⁷

The trend towards digitalization in the world affects model photography in other ways. As a pioneer, physical model simulations used in the solution of building problems such as light, acoustics, heat, and structure were replaced by digital simulations. Although virtuality has been developed since the 1960s, it began to take its place in the daily life of architectural practice with the availability of a personal computer in the 1990s. In order to solve the workload more effectively in professional architecture offices, architectural projects have been moved to digital media. In addition to the traditional design methods, architecture schools also included the representation methods developed by the computer in education. Since then, more traditional representation methods and their digital counterparts have been compared many times. Nevertheless, it is difficult to evaluate the effect of digital methods objectively and historically, since not enough time has passed.

In conclusion, virtual environments provide an alternative space for the experiments of the researcher and the architect. When the physical and digital simulation environments are compared, physical simulations are more credible as they are bound to real physical laws. An example will be given for comparing simulations for physical and digital realms. In her Ph.D. thesis titled “Scale Modeling of Structural Behavior in Fire” (2006), Ming Wang advocates using mock-ups for fire tests. She explains the advantages of the model and tells that current research has brought

¹³⁷ Aslı Arpak, “Physical and Virtual: Transformation of The Architectural Model”, Unpublished M.A. Thesis, Middle East Technical University, 2008)

significant advances to simulate both fire and structural behavior; however, simulations can lead to incorrect predictions due to lack of validation. The use of scale models reduces these problems and acts as an economic tool to detect weakness in buildings in case of fire.¹³⁸ However, as simulations become the necessary tool in many areas of sciences, it is inevitable that there will be a tendency for all simulations to transform into digital in the future. Despite their apparent differences, the environments of the physical and the digital model can be described as ‘virtual’ according to their compatibleness for simulations.

3.4.2 Computer-Generated Images

Digital model images also have some formal similarities with model photographs. The imaging of digital models is not separate from the previous conventions of visual perception as similarities had been found in different representational systems of the past as in the examples of tableaux vivant and staged photography, Dutch landscape painting, and photography. Geoffrey Batchen explains this issue very clearly in the following paragraph:

In fact, at the moment, digital images remain dependent on photographic ways of seeing, not the other way around. And the computer itself continues to depend on the thinking and world view of the humans who program, control, and direct it, just as photographs do. While the human survives, so will human values and human culture—no matter what image-making instrument that human chooses to employ.¹³⁹

The effect of computer-driven imaging processes on the photographic image has been discussed for three decades. Geoffrey Batchen has written many articles about this issue. In “Phantasm: Digital Imaging and the Death of Photography,” he explains the main anxieties caused by digital photography. First, a realist image can completely be formed by a computer, and it can be easily confused with an actual

¹³⁸ Wangi Ming. (2006) “Scale Modeling Of Structural Behavior in Fire” Ph.D. Thesis.

¹³⁹ Geoffrey Batchen, “Phantasm Digital Imaging and the Death of Photography” *Aperture*, No. 136, *Metamorphoses: Photography in the Electronic Age* (Summer 1994), 48.

photograph. Secondly, the claim of photographic truth and the public trust on the medium was shattered by the expanse of computer-generated images in public. This trust was so powerful that photographs were used as evidence, even in courts in the past. Batchen says that “[...] digital imaging actually returns the production of photographic images to the whim of creative human hand.”¹⁴⁰

The transformation from painting to the mechanical, non-subjective image at the beginning of the 19th century is being reversed at the end of the 20th century. It was claimed many times that the photographic image always had the potential to be manipulated to some degree, but at least it had an indexical connection. The digital image is described here as “a signing of signs.” He argues further that photographic image was already a digital process itself, a pictorial transformation of a 3-dimensional world, so it was nothing more than “a signing of signs.” He continues that technological developments such as digitalization, calls into question and inevitably change “the presumed separation of nature and culture, human and nonhuman, real and representation, truth and falsehood, on which our photographic, so-called Cartesian epistemology has hitherto depended.”¹⁴¹

Stan Allen also repeats this notion in “Terminal Velocities.” However, he is more pessimist about the boundaries of the newly defined fields: “Sign and referent, nature and culture, human and machine; all these hitherto dependable entities appear to be collapsing in on one another to the point where they have become indivisible. Soon, it seems, the whole world will be turned into an undifferentiated “artificial nature.”¹⁴²

Allen is critical about the realistic tendencies of digital technology, which imitate existing realities more than creating new realities.¹⁴³ He says that technological

¹⁴⁰ Ibid, 48.

¹⁴¹ Ibid, 47-50.

¹⁴² Ibid, 47.

¹⁴³ Stan Allen, “Terminal Velocities: The Computer in the Design Studio.” in John Beckmann, *The virtual dimension: architecture, representation, and crash culture* (New York: Princeton Architectural Press, 1998), 246

progress for a more realist representation of architecture is demanded to eliminate possible mistakes before building. He adds that one of the deficiencies of such realist visuals is the inability to mimic natural visual perception. The second deficiency is its lack of abstraction, “the power of conceptualization,” which was inherent in previous forms of representation.¹⁴⁴ He continues to explain the transformation in the digital image, “The status of the drawing, and in turn, the process of design itself undergoes a transformation. A new kind of abstraction emerges, abstraction not as a result of operations of idealization or reduction, but of the indifferent order of bits.” He says that this abstraction is different from analog forms of representation, which create “imprints, traces, transfers” of reality. The “iconic form” and the relationship of parts are preserved in the photographic or cinematic image. However, in the digital image, “hierarchies are distributed; ‘value’ is evened out.”¹⁴⁵ “Most of the historically essential functions of the human eye are being supplanted by practices in which visual images no longer have any reference to the position of an observer in a “real,” optically perceived world. If these images can be said to refer to anything, it is to millions of bits of electronic mathematical data.”¹⁴⁶

¹⁴⁴ Ibid, 246

¹⁴⁵ Ibid, 248-9

¹⁴⁶ Jonathan Crary, *Techniques of the Observer*, 1-2.

CHAPTER 4

SIGNIFICANT EXPERIENCES OF THE ACTORS IN MODEL PHOTOGRAPHY

In this chapter, the roles of model photography will be discussed through cases, which are mostly pioneering works of that period, known well by the architectural community. The cases will be limited with the examples of the experimentation era of model photography because it had been difficult to cover cases from different eras in the scope of this thesis. The cases were selected by considering the studies of different disciplines of architecture such as engineering or city-planning, and also focusing on the different roles of model photography.

While defining the fundamental roles of model photography, the definitions were inspired by the categorization of roles in an anthology on photography. This book is *Photography's Multiple Roles*, and it refers to the practices of “art, document, market and science” as the primary roles of photography. The book categorizes four significant roles of the medium as “artistic expression, journalistic documentation, commercial industry, and scientific tool.”¹⁴⁷ As it can be seen in the following examples, model photography includes similar working dynamics with photography. This categorization has been very useful to deal with different concerns of each practice. When real-life examples are examined, these roles seem to get intertwined in many practices. For example, the techniques of scientific experiments can be used in designing, and later, these photographs can also be used by others to market

¹⁴⁷ Eugenia Parry, Naomi Rosenblum, Franz Schule (Contributor), *Photography's Multiple Roles*, D.A.P./The Museum of Contemporary Photography, 1998.

architectural works. In addition, a quantitative analysis will be made to see whether model photography has been a preferred tool for the architect to represent his/her work in this chapter.

At the beginning of the century, modelmaking was closer to traditional craft practices. Karen Moon states that with reference to an article from 1939, there were three types of models according to their materials: clay or plastering, cardboard, and wood at that time. However, the new popularity of modelmaking and an increasing amount of architectural commissions was starting to change the rules in the market.¹⁴⁸ Mechanization, experimentation, and the practical use of tools and materials in unusual ways became prior to superior skills in craft, gradually.

Historians of architecture state that during the 1920s, architects began to move from drawing to model making as the preferred medium of representation.¹⁴⁹ Models have always been instrumental in the practice of the architect. Still, the emergence of more straightforward production techniques in model making led to a significant increase in its popularity in architectural offices. The advantages of cardboard to plaster was that it was both an affordable and practical medium in modelmaking. The economic advantages of the material are not enough to understand the success of cardboard modeling. The representative qualities of the material turned out to be a good match with Modern architecture with its emphasis on geometry and lack of ornaments. This match was such a success that modern architecture was accused of looking like it is made of cardboard by the opponents of modernism.¹⁵⁰

This criticism gives a clearer insight into the popularity of modeling at the beginning of the 20th century. The printing of photographs in magazines and their dissemination across the world were powerful motivations for the architects in this period. Model photography was an ideal alternative to drawing for the representation

¹⁴⁸ Moon, *Modeling Messages*, 146

¹⁴⁹ Karen Moon, *Modeling Messages* (New York: The Monacelli Press, 2005); Mark Morris, *Models: Architecture and the Miniature* (Wiley, 2006)

¹⁵⁰ Beatriz Colomina. "Media as Modern Architecture" in *Thomas Demand* (London: Serpentine Gallery), 19–46.

of unbuilt projects. Davide Deriu emphasizes that the partnership between modeling and photography was beyond practical reasons. The general adherence to objectivity and technicality in the modernist period aroused interest in both modelmaking and photography instead of drawing, which can be regarded as a subjective activity. Deriu explains this issue in his words:

The camera played into the hands of architects and critics who regarded design as a conceptual activity and the model as the materialization of an abstract idea. (...) If the model could embody a design idea, photography endowed it with an objective status whilst also making it manifest at a glance. This phenomenon crystallized at a historical turning point when the architectural profession was radically reorganized at all levels, from the educational system to the modes and circuits of communication.¹⁵¹

With the influence of these factors, model photography became a practice used by many architects and spread rapidly with the help of magazines in the 20th century. In this chapter, highlighted projects of model photography will be investigated from the fields of architecture, urban planning, and civil engineering. Besides these examples, other practices from fine arts and popular culture which are involved with model photography will be investigated shortly in order to draw the big picture of the era.

4.1 Architect

4.1.1 Design of the Architect: Ludwig Mies van der Rohe

Mies van der Rohe can be the architect who had his photograph taken with his models by far the most.¹⁵² These photographs were mostly taken in Chicago, and they belong to a canon that shows the models as trophies of the architects. But he used models

¹⁵¹ Davide Deriu. "Transforming Ideas into Pictures" in Higgott, Andrew, and Wray, Timothy (eds.), *Camera Constructs: Photography, Architecture and the Modern City*. (Ashgate, Farnham, 2012), 160

¹⁵² Phyllis Lambert, *Mies in America* (Harry N. Abrams, 2001) 204–217, 569–570

and their photographs throughout his professional life in both Germany and America. In this chapter, an experimental model photo which belongs to one of his works in Berlin will be analyzed, because it is a forerunner example which combined the advantageous sides of the two media nearly one hundred years ago.

It is said that; the focus of Mies was always building in physical terms; in different words, the physical building was superior to its representations in his mind. At the same time, he was very productive in drawing and left behind a massive archive of drawings. He preferred perspective drawing to the orthogonal drawing, which was getting popular among modern architects at that time. There is also an archive of architectural and model photographs, but historians say that it is not a well categorized, consistent document of his work. He usually assigned professional photographers for the shooting, but he was always critical for the selection of the images which would appear in publications.

Beatriz Colomina states that five visionary projects he designed in Berlin in the 1920s made him respectable in Weimar avant-garde circles: The Friedrichstrasse Skyscraper (1921), the Glass Skyscraper (1922), the Concrete Office Building (1923), the Concrete Country House (1922), and the Brick Country House (1923)¹⁵³. These projects are contradictory in style with his conservative house projects, which were built at the same time in Berlin.¹⁵⁴ These visionary projects have been documented through drawing, collage, model, and model photographs. The projects were also published in avant-garde, and professional journals, such as *Frühlicht*, *G* (which he worked with Hans Richter in person), the *Journal of the American Institute of Architects*, *Merz*, *Wasmuths Monatshefte für Baukunst*, *L'Architecture Vivante* and many books on modern architecture was written during the 1920s.¹⁵⁵ It points

¹⁵³ Beatriz Colomina, "Mies Not" in Detlef Mertins, ed., *The Presence of Mies*, (New York: Princeton Architectural Press, 1994)

¹⁵⁴ Colomina

¹⁵⁵ Colomina, "Media as Modern Architecture", 18-20

out that Mies was in search of pioneering architectural design and actively used representational media for this purpose.¹⁵⁶ He would be able to build the glass skyscrapers later in Chicago, where he would find the necessary environment for building his visionary projects.

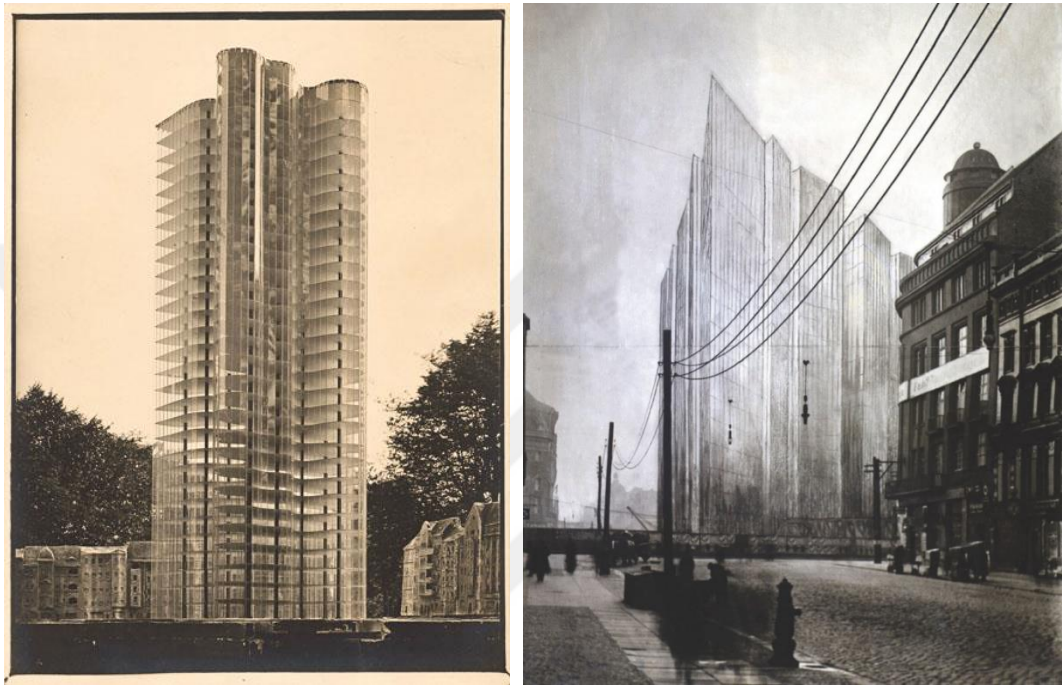


Figure 4.1 Left, Model Glass Skyscraper, 1922. Photo: Curt Rehbein

Figure 4.2 Right, Friedrichstrasse Skyscraper Project, Berlin, 1922. Photograph of lost photomontage. Mies van der Rohe Archive. The Museum of Modern Art

The photographs of the Concrete Office Building, the Friedrichstrasse Skyscraper, and the Concrete Country House were designed in poster-size for display. Claire Zimmerman analyzes the architectural photographs of Mies in her dissertation and explains further the graphic effect of the photographs of these five projects according to her interview with Elke Duda of the Haus Lemke Stiftung in Berlin. Duda argues that this form of display looked like modern street advertising posters in the way that

¹⁵⁶ XinWu, "Opacity in Transparency, From Drawings and Photographs of the Modern Domestic Spaces by Mies van der Rohe" (Unpublished M.A. Thesis, McGill University, Montreal), p.21

it made an unfamiliar content familiar to the public. Zimmerman says that using this way to get the attention of the public was extraordinary at that time, and his intention was to use images “precisely as propaganda to ensure their success.”¹⁵⁷

Among these projects, the 1922 skyscraper project stands out as an extraordinary example of glass architecture and model photography. The Friedrichstrasse Skyscraper project was designed in 1921 for a competition, and that building also had a glass façade. Mies made this famous statement when these projects were published for the first time: “Only in the course of their constructions do skyscrapers show their bold, structural character, and then the impression made by their soaring skeletal frames is overwhelming.” He was criticizing the monumental skyscrapers that were built at that time. In contrast to the triangular plan of Friedrichstrasse Skyscraper, Mies designed a free-form plan in 1922. The architect describes the design process of this form as follows:

“I placed the glass walls at slight angles to each other to avoid the monotony of overlarge glass surfaces. I discovered by working with actual glass models that the important thing is the play of reflections, not the effect of light and shadow as in ordinary buildings. (...) At first glance the curved outline of the plan seems arbitrary. These curves, however, were determined by three factors: sufficient illumination of the interior, the massing of the building viewed from the street, and lastly the play of reflections.”¹⁵⁸

There are also façade drawings of these projects where Mies studied the effect of their reflections. When these drawings and the model photograph are compared, it can be said that his admiration of the skeletal frame can be better observed on the model. The transparency of the glass and the reflections it produces on an unbuilt project can be hard to draw on paper, but also the general trust in the objectivity of photography must have increased the effect of the photograph at that time.

¹⁵⁷ Claire Zimmerman, “Modernism, Media, Abstraction: Mies van der Rohe's Photographic Architecture in Barcelona and Brno (1927-31)” (Ph.D. Thesis, The City University of New York, 2005), 66-7

¹⁵⁸ Terence Riley and Barry Bergdoll, “Glass Skyscraper Project”, in *Mies in Berlin*, 186

The impact of these drawings and model photographs is well explained by Colomina. She says that Mies was not able to build glass skyscrapers because of the lack of technical expertise at that period. With the help of the photograph, he created the illusion that he built that skyscraper. Further, she argues that it is possible to assume that he had built it with the image, and through that, he reached the imagination of architects who would design similar projects in the future.¹⁵⁹

The glass skyscraper photograph was taken by Curt Rehbein, whose architectural photographs can now be found on the websites of contemporary auctions. Zimmerman says that Mies was not committed to photographers in Berlin.¹⁶⁰ But in Chicago, Bill Hedrich of the Hedrich-Blessing Studio shot most of the Mies's American work. In Mies's architectural office, Edward Duckett was the master model maker, and the modelmaking department occupied up to one-quarter of the office.¹⁶¹ Fortunately, there has been a project of oral history about the architects of Chicago under the auspices of the Art Institute Chicago, and it is possible to learn the experiences of people who worked with Mies.

Gene Summers was an architect in his studio, and she says that they began to use models more than drawings over time. Most of the models were thrown away during clean-ups. She adds that most of the models were study models, but they only photographed presentation models. Still, they always sent finished models and buildings to Hedrich-Blessing Studio. They did not work with them only because they were good at this, but also, they kept their photographic archives in one place.¹⁶² The interview of Bill Hedrich gives some clues about photographing Mies's models. He tells the exhausting experience of working with Joe Fujikawa, Mies's assistant, to shoot architectural models:

¹⁵⁹ Colomina, "Media as Modern Architecture", 20

¹⁶⁰ Zimmerman, "Modernism, Media, Abstraction", 43-4

¹⁶¹ Atli Magnus Seelow, "Models as a Medium in Architecture", 7

¹⁶² Interview with Gene Summers, interviewed by Pauline A. Saliga, (Chicago: Art Institute of Chicago, 1993) 38-42, <http://digital-libraries.saic.edu/cdm/compoundobject/collection/caohp/id/10620/rec/5>

Hedrich: (...) We worked together, and the things we did mostly were models. Can you believe, models? Mies would make a model, I'd photograph it. We'd work two days on it. It was difficult, putting backgrounds, clouds, doing everything. Mies would study it—"It's good. We'll make one change." So we'd change one thing on the inside or on the outside, one small change on the architecture, not the photography, and then Joe would come in, "Okay, we're going to redo the model shots. Mies made a change." Then we'd shoot all those. Now we're shooting another day. Much work. Mies would study it—study the model, make another minor change and we'd shoot it all again. Oh, I can't remember how many times I photographed some of these models. You know, like the Farnsworth house and other houses, other things he did. Not that alone. I can't remember which ones we did because we photographed all of his houses. He did models on every project, and he would scrutinize them so carefully. Not the work, the model. He'd see something through the photograph. He'd look at the photograph and run over to the model and change something, then we'd shoot it again. Oh, I was so tired of shooting the same thing over and over and over. I felt I could never do another creative shot on that project.

Blum: It sounds like he was using the photographs as a mirror to help him with what he was doing, and that was the model and, eventually, the building.

Hedrich: It helped him. He made the model not to show the client. He made the model for himself and his designers to study. They were study models, and they used them that way.

Blum: And the photograph for him sounds like a tool to help him really see the model.

Hedrich: I think he saw things in the photograph that he didn't understand and didn't see before.¹⁶³

Between 1963 and 1969, Mies donated most of his documents to the Museum of Modern Art (MoMA) in New York. With the donations of his contemporaries, there is an incomplete, but still impressing Mies archive in America and Germany. The photographs of Mies's work have been the focus of Claire Zimmerman, who asserts that "[architectural] photographs helped introduce a particular set of ideas about modernist abstraction into architecture, and that these ideas owed a great deal to other modes of two-dimensional abstraction."¹⁶⁴ She does not use model photographs to

¹⁶³ Bill Hedrich (William C. Hedrich), in Oral History of William C. Hedrich, interviewed by Betty J. Blum (Chicago: Art Institute of Chicago, 1994), 138-41.139. <http://digital-libraries.saic.edu/cdm/compoundobject/collection/caohp/id/5993/show/5892/rec/2>

¹⁶⁴ Zimmerman, "Modernism, Media, Abstraction", 10

prove her theory, but considering Mies's obsession with models, further investigation of Mies's model photographs would help to understand the admission of abstraction into the realm of architecture.

Model photography was used in the design process in the 1920s, as seen in the glass skyscraper project of Mies van der Rohe. Model making is an integral part of Mies' design process. The appearance of the model in the photograph can lead the architect to make changes in the model. Mies observes and analyzes the model by looking at the photos. He uses model photographs actively for making design decisions. On the other hand, the architect designs the photograph considering its effect on the audience. The image created with these photographs has been useful in showing the duty and work of the architect to the public. Academic studies that evaluate the place of Mies' architectural photographs in modern architecture emphasize the importance of photography in Mies' career. It can be said that the researches made for model photographs of Mies projects support these arguments. It may even be possible to reveal Mies' pioneering experience in model photography with more in-depth research.

4.1.2 The experiment of the Architect: Antoni Gaudi

Models and photographs have been used as tools for the solution of architectural problems in engineering disciplines for a long time. Problems with the structure, acoustics, light, heat, fire are some of the fields of experimentation and development for engineers. In this example, brief information about the methods of solving structural problems in history will be given, then how Antoni Gaudi had used modelmaking and photography in his experiments in the early 20th century will be explained.

“Toys that save millions' - A history of using physical models in structural design” is an article giving information about the experiments of engineers that are relevant to the field of architects. Its author, Bill Addis, is a consulting engineer, and he has

written many articles about the role of model testing for the development of structural engineering. He gives the first rule about model tests is that not all structures can be analyzed with scale models because there are two types of structural behavior that can be scaled up linearly. For instance, while the compression behavior of masonry arches and vaults can be tested with the scale model, the strength and stiffness of a beam cannot. This observation explains why masonry structures could be well developed in history before the necessary mathematical calculation methods were known. The difference between these two behaviors could not be understood until the mid-18th century when the concept of elasticity was developed.¹⁶⁵

The first recorded use of the models in civil engineering belongs to the works of engineer and scientist Robert Hooke (1635-1703) and Christopher Wren (1632-1723) in London. Wren's sketches of the dome of St. Paul's Cathedral, with a diameter of 33 m, shows a chain suspended on the cross-section of the building. This method was used to prove the stability of the dome and to decide the final shape of the section.¹⁶⁶ In the 1670s, Hooke was searching the ideal shape for an arch and found that the solution was helioscopes: "As hangs the flexible line, so but inverted will stand the rigid arch."¹⁶⁷ This finding meant that "the equilibrium form of an arch was the same (although inverted) as a hanging chain comprising the same weights as the arch." This method was used by the German engineer Heinrich Hübisch (1795-1863) and further developed over time. In the second half of the 19th-century, books were saying that hanging models were the best method for designing arch and vault shapes.¹⁶⁸

¹⁶⁵ Bill Addis, "Toys that save millions' - A history of using physical models in structural design", *The Structural Engineer*, April 2013, 12-3

¹⁶⁶ *Ibid*, 14

¹⁶⁷ Santiago Huerta, "Structural Design in the Work of Gaudí", *Architectural Science Review*, 49:4, (2006) 324-339, DOI: 10.3763/asre.2006.4943

¹⁶⁸ Bill Addis. "Physical Modelling and Form Finding". *Shell Structures for Architecture*. 35-7

The use of models for the analysis of structural problems was well known before the development of mathematical calculation methods based on drawings. This new method was called Graphical Statics and was introduced to the public with the monograph entitled *Die Graphische Statik* (1864-1866), written by the German civil engineer Karl Culmann (1821-1881). In this work, Culmann developed a method to calculate the weight of steel structures with the help of the diagrams. With the help of this development, engineers were able to solve structural problems without models.¹⁶⁹

When talking about catenary arch models, Antoni Gaudi is the first architect who comes to the mind. He was not the first one to use these models, as stated above. However, this method was used mostly for arches, and there were not many examples for its use for the design of vaults.¹⁷⁰ Gaudi was one of the first graduates of the Provincial School of Architecture in 1878, and they were all equipped with a range of disciplines: technics, science, art, history, archeology, which separated them from the conventional master builders.¹⁷¹ It is stated that he had been taught about Graphical Statics in the school.¹⁷² He opened a studio in Barcelona and got his first important commission in 1878. From the beginning of his practice, he used sculpture, painting, and photography, which would let him design in his own way.

It is generally accepted that Antoni Gaudi's approach to design is different from his contemporaries. Gaudi was genuinely interested in religion and nature. Gothic architecture and the forms of nature were sources of inspiration for his designs. He thought that each element of the building was related to each other and designed them to the smallest detail. The use of chains provided him a method not for only the

¹⁶⁹ Santiago Huerta, "Structural Design in the Work of Gaudí", 325.

¹⁷⁰ Ibid, 330.

¹⁷¹ Maria Antonietta Crippa, Antoni Gaudí, 1852-1926: From Nature to Architecture, 9

¹⁷² Santiago Huerta, Op. Cit

verification of the structure's stability, but for designing the form of the building and solving the problem of stability at the same time.¹⁷³

His commission for the Church of Colònia Güell was significant as he could use the space-hanging chain model for the experimentation and verification of his structural design. It is said that the methods he developed for this church were later used in the design of the Sagrada Família. The client of Gaudi, Catalan entrepreneur Eusebi Güell, provided the freedom that the architect needed. The design of the church lasted ten years, and only the crypt could be built in 8 years. In this project, he used a 1:10 space-hanging chain model with a height of 4 meters in a shed next to the building. In an article dedicated to the structural works of Gaudi, the author explains the method of using the model for the design of the Church of Colònia Güell:

[...] First of all, the main skeleton is created, where the main cables represent the main thrust paths. This first model adopts a particular shape. Based on this configuration, the area and weight of the elements are calculated, and the model is loaded using small sachets full of sand. These loads modify the shape of the model. The weight is then recalculated, and the loads are adjusted in the model to match the newly calculated values. The model adopts a shape very approximate to the equilibrium shape. The resulting shape can be observed and could be altered by changing the geometry and/or the loading. To show the volume ("give volume") of the model, Gaudí tried out different methods. One of them consisted of taking a photograph and drawing on it with gouache. On other occasions, he placed cloth or paper over the model before taking a photograph, which would be drawn on as before.¹⁷⁴

This paragraph briefly explains the complexity of the design process. Each component of the structural model was acting together, and any intervention to a component was causing a change in the entire model. Here, the photograph of the model was not used for its experimental potential, but its ability to freeze the moment and represent the design on a two-dimensional context. It was used as a medium for the materialization of the ideas in the first place. Gaudi was able to draw perspectives

¹⁷³ Ibid, 325

¹⁷⁴ Ibid.

of the church with the help of the photograph. Photography often works for the reproduction and reconfirmation of the project, but in this case, it became a tool for creating an accurate outline of the project.

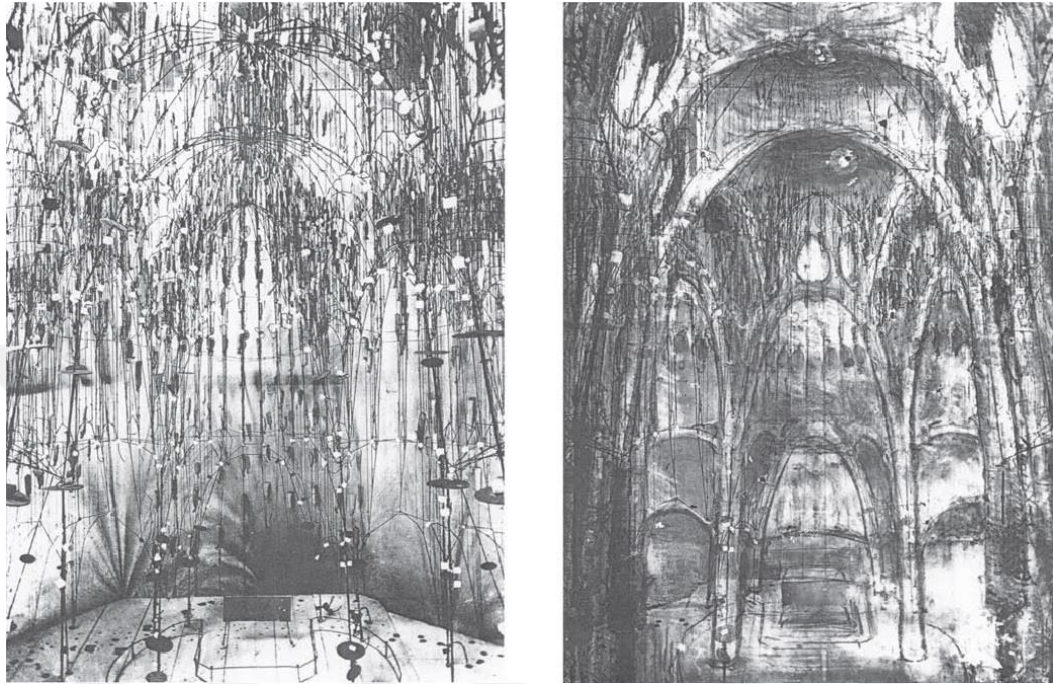


Figure 4.3 Left, inverted photograph of the hanging model, depicting the interior of the church of the Colònia Güell.

Figure 4.4 Right, gouache drawings to show the interior space (Puig Boada 1976)

Source: Santiago Huerta, “Structural Design in the Work of Gaudí”, 325.

The photographs have also been used later in Gaudí's other works, that were not finished in his lifetime, to implement the designer's decisions as accurately as possible. The original model of the Church of Colònia was destroyed. Gaudí's workshop was also destroyed during the Spanish Civil War of 1936–39. The only remains were a few photos of the model he built in his workshop and a few sketches and drawings. For example, 19 original photo glass plates of the church's model were rediscovered in an architectural archive in Barcelona, by chance.¹⁷⁵ The

¹⁷⁵ Klaus Hanke, Michael Moser. “Scanning of Antonio Gaudí's Original Images of His Draft For a Church in Barcelona”

photographs of the drawings and models have been the only media for future generations to reach the architect's original representational work.

In 1929, Isidre Puig-Boada published *El temple de la Sagrada Família*, and in 1976 *L'església de la Colònia Güell*. Boada was a disciple of Gaudí, with whom he collaborated in the Sagrada Família, of which he was co-director of the works during the the 1950s.

Nowadays, design, visualization, calculation, and documentation are carried out in virtual environments. It is easier to understand and use Gaudí's design method today because technologies became mature enough to perform these functions in digital environments. In conclusion, one of the factors that helped Gaudí succeed in realizing this sophisticated design more than 100 years ago is that he used representational tools such as models and photographs successfully in an unconventional manner.

4.2 Artist

4.2.1 Plastic Arts: Medardo Rosso in Photography of Sculpture

In this thesis, it is aimed to investigate the potential functions of model photography as a unique technique and to evaluate them through cases in history. The earliest cases given, belong to the period after the first world war because it has been accepted that photography has a close relationship with modernism. However, at the beginning of the 20th century, a practice that has similar features with model photography was experimented on the sculpture by Medardo Rosso. He was an Italian post-impressionist sculptor, who worked on both theoretical and practical levels. The assumption given above is based on the Ph.D. dissertation of Francesca Bacci. She analyzes the photographic work of Rosso, which includes 800 prints and 180 negatives on glass plates. She says that Rosso's interest in photography began to attract scholars' interest after a monographic show held in Milan in 1979. Art

historian, Carlo Bertelli argued in 1979 that Rosso's sculpture design was influenced by photography, so the final work seems to be a photograph rather than a sculpture. Curator, Adalgisa Lugli, said that the reason Rosso used photography was to dematerialize the material and to perform artistic experiments that represent movement. An author, Gabriele Stix-Marget, argued that photographs should be accepted as independent conceptual artworks.

Francesca Bacci has made a comprehensive analysis of all Rosso's works on photography. She asserts that Rosso's sculptures were not monumental and aimed to leave an impression of greatness in the viewer's gaze through photographs. Rosso was in competition with his contemporaries, one of which was Rodin, so that he had to construct a public self. In addition to active production, Rosso has also studied theory to prove the validity of his works. According to his aesthetic theory, the sculpture should make the viewer forget the materiality of the sculpture and convey the sensations the sculptor felt while making the sculpture, to the viewer. Secondly, in parallel with the reliance on the power of the sense of sight in that period, he said that objects were only perceived by light and color so that nothing in the space was material. In line with these theories, Rosso said that his sculptures were made not to be touched, but to be viewed, so he used to exhibit his sculptures in glass cases. The showcase was known at that time and mostly used to protect sensitive objects from careless viewers, and for the purpose of highlighting the object. Rosso used showcases to protect the patina on his sculptures, but that was not his only purpose. With the frame of the showcase, he arranged the viewpoints of the sculpture and presented it as a painting. Since the Renaissance, painting has been accepted as a window that represents another reality. With this showcase, Rosso's sculptures were no longer an object in space but could have an impact on the audience beyond their physical limits.

Bacci summarizes the role of the photographs for the benefit of the sculpture as follows:

the complex artistic purposes of the photographs:

(...) firstly as theoretical visual statements, secondly as studies on the relationship between environment and sculpture through its display in glass cases, thirdly as a tool of critical analysis of the sculptures in the making. By observing the monochrome rendering of his work through the photographs, Rosso could better evaluate the relationship between lights and shadows, matter and air, and then decide to rework his sculpture consequently. There is undoubtedly a relationship between multiple photographic prints and sculptural replicas; I proposed that a further purpose of the photographs is to allow Rosso to visualize the effect that different coloured patinas would have on his bronzes through multiple prints in different chromatic washes obtained from the same negative. The artist used the photographs as if they were “retro-preparatory” drawings (a posteriori, when a sculpture already existed) - significantly, none of the extant drawings is directly preparatory for sculptures.¹⁷⁶



Figure 4.5 Left, Photograph of the Sculpture, *The Concierge*, Medardo Rosso, 1883.¹⁷⁷

Figure 4.6 Right, Photograph by Medardo Rosso.¹⁷⁸

¹⁷⁶ Francesca Bacci, “Impressions in Light: Photographs of Sculptures by Medardo Rosso (1858-1928)”. Unpublished Ph.D. Thesis in The State University of New Jersey, Graduate Program in Art History, 2004.

¹⁷⁷ <http://pictify.saatchigallery.com/905339/moma-the-collection-medardo-rosso-the-concierge-1883> [Last Access on 27.01.2020]

¹⁷⁸ <http://www.medardorosso.org/foto.html>, [Last Access on 27.01.2020]

The experience of Medardo Rosso shows that the photography of sculpture has some similar features with model photography in architecture. The photographic space provides a medium for the artist to study his work in terms of its visual effect. In addition, the visual influence of the sculpture seems to be important in Rosso's works. This practice reflects the artistic tendencies of its era with its emphasis on visuality.

Mies' use of model photography in architecture and Medardo Rosso's use of this technique in sculpture have similar features. Rosso aimed to control how people see their sculptures through photography. Architecture and sculpture can be a subjective, versatile, multi-faceted experience in one-on-one interaction. However, the experience gained through photography may be more intense and more controllable. The author of the thesis, which is referenced, lists the operations applied by Rosso on photographs as follows: playing with light, color, and contrast settings, using the mirror image, creating repetitions and series, collage, enlarging, shrinking and reducing details. These operations, which he could do with sculpture, were more straightforward and faster with photography. Rosso was not using Mies' style of publicity but was using photographs to introduce his work and art theory to the public. For this, he used the method of comparing photographs between his works and Antiquity and Renaissance works, his old and new works, or works between his works and other artists.

4.2.2 Performing Arts: Metropolis and the Schüfftan Process

The discovery of cinema dates to 1895. Early films have been evaluated as technological demonstrations rather than being a medium for storytelling. Special effects were among the first discovered techniques of the cinema. There has already been a familiarity with tricks in societies coming from the magic theatres of the 19th century. The introduction of special effects is attributed to Georges Méliès, who shot about 1200 short films between 1896 and 1913. Originally a magician, Melies used both storytelling and special effects in his films. He is the inventor of many special

effects techniques. The use of miniatures was one of them, and it was first used in *A Trip to the Moon* (1902).¹⁷⁹ Since then, miniatures have been a tool to illustrate fictive, or unaffordable spaces in films.

In the period between 1910 and 1930, German silent cinema played an influential role in the discovery of cinema as a medium where technology and art met. They visualized fantastic stories and followed a specific aesthetic style. Katharina Loew has provided the necessary information to understand the significance of these films. She says that the directors of this period discovered the techniques of narrative specific to the cinema and used technology as a tool to visualize the unreal and the impossible to tell stories about more abstract subjects.¹⁸⁰

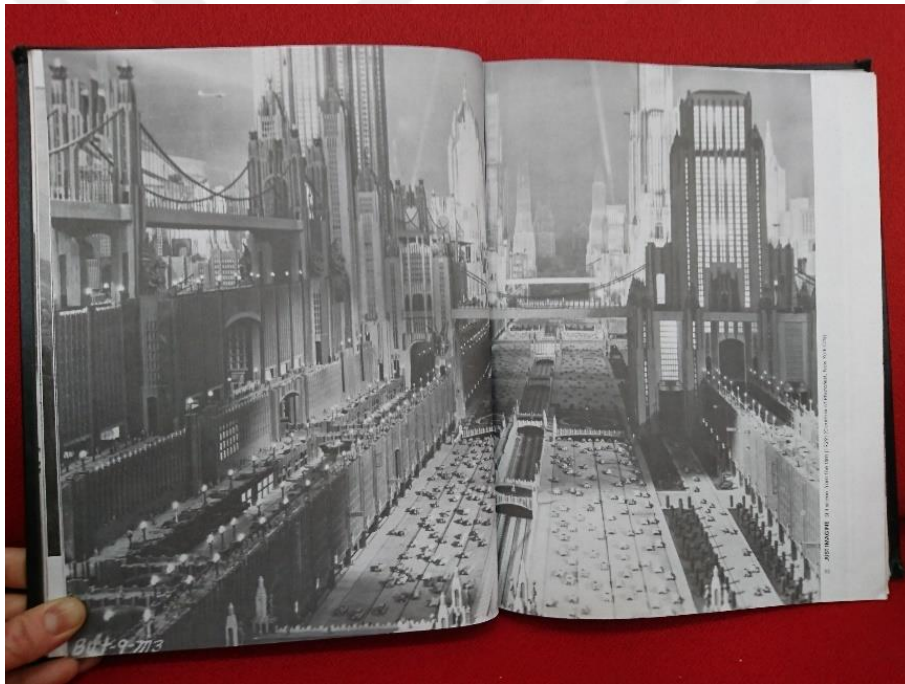


Figure 4.7 Film Still from *Metropolis*. Photo by author.

Source: Ernest Burden, *Visionary Architecture: Unbuilt Works of the Imagination*

¹⁷⁹ Dan North, Magic and illusion in early cinema, *Studies in French Cinema*, 1:2, (2001), 70-79, <https://doi.org/10.1386/sfci.1.2.70>

¹⁸⁰ Katharina Loew, “Techno-Romanticism: Special Effects in German Fantastic Films of the Silent Era”, Ph.D. Thesis, The University of Chicago, 2011.

Metropolis, which is among these films, is now defined as the first example of the science fiction genre. The film's director, Fritz Lang, was saying that he designed this film together with his wife, Thea von Harbou, with the motivation of New York's influence he experienced in his first trip in 1924. At the end of the ambitious and aggressive shooting and production process, which lasted 2.5 years, the film was subjected to both positive and negative criticisms. Because of the interventions, the film had to be cut by half an hour.¹⁸¹

Although the film was appreciated in terms of story, direction, and acting, its visual presentation attracted considerable attention. The special effects used in the film played an important role in creating this effect. Stop motion, and Schüfftan techniques, matte drawings and paintings, flat wooden relief models, and three-dimensional models were used during production. The creation of the illusion of a future city, in this case, a dystopia, was made possible with the collaboration of the paintings and miniature with the camera.

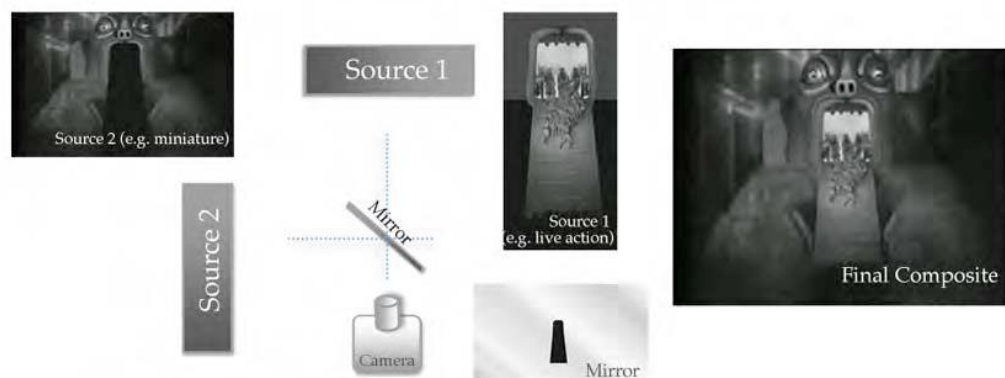


Figure 4.8 Schematic rendering of a shot in the Moloch-sequence in Metropolis (Ufa, 1925/1926, dir. Fritz Lang), created by means of the Schüfftan process.

Source: Katharina Loew, *Techno-Romanticism: Special Effects in German Fantastic Films of The Silent Era*, 70

"The Schüfftan process" was invented by Eugene Schüfftan, and it used mirrors to combine actors, full-sized sets, and miniatures on camera. It was first professionally used in Metropolis. The significance of the Schüfftan process was that, with this

¹⁸¹ Frank Miller, "Metropolis", <http://www.tcm.com/thismonth/article/25817%7C0/Metropolis.html>

technique, an illusion could be portrayed “as if” it was real through technological means, and this new awareness changed the way European cinema’s opinion for special effects techniques. The visual result was so satisfactory that it opened the way for its commercialization. Loew explains the significance of this special effect:

During the 1920s, German film production became progressively rationalized, standardized, and globalized as the demands of an international and profit-oriented entertainment industry prevailed. In the field of special effects, the Schüfftan process surged ahead in terms of streamlining and commercialization. Between 1922 and 1930, Schüfftan was granted over forty patents in at least eight countries for variations of his process, and he subsequently embarked on an unprecedented global business strategy.¹⁸²

The popularity of miniature in that time can be quantitatively evaluated with the help of Harrison Hillfinger’ study which analyzes the film effects used in the film *King Kong* (1933). He says that the use of miniatures is advantageous over other solutions in terms of time and money. They provide a controllable working environment for light, sound, acoustics, and camera shooting. The thesis determines that 84% of the scenes with special effects used in the film (63 scenes) use miniature partially or entirely.¹⁸³

The following paragraph was taken from another dissertation about motion Picture set design. It explains why miniatures became so popular during that time:

The producer likes the models because he can more easily appraise production values and cost. The director likes the models because he can very easily move the little figures around to plan his action. The cameraman likes the model to plan his lighting; the star likes the models because he or she can mentally adjust to the action in proportionate space. The art director likes the models because they help him to more easily “sell” his set. The sketch artist likes them because he can place them at certain angles and make his sketches directly from the model. The set designer likes them because he sees the

¹⁸² Katharina Loew, *Op. Cit.* 75

¹⁸³ Harrison Hillfinger, *A Study Of The Significance And Application Of Special-Effects To The Cinema*. M.A. Thesis. The Faculty of the Department of Cinema University of Southern California, 1941.

development of his proportions, shapes, intersections, and warped surfaces in time to correct working drawings. In fact, everyone likes the models because when they are looked at from every angle through the plaster camera angles which accompany them, there is little doubt as to what the set will look like on the screen.¹⁸⁴

The brief analysis of the film *Metropolis* and the Schüfftan process has been described from the viewpoint of its creators. To understand the effect of these special techniques, the viewpoint of the viewer is also important. In the following lines, Sarah L. Higley, a science fiction writer and professor of English, describes her feelings as a viewer of these movies:

For in the world of commercial miniatures, I am always disappointed; but in the world of movie miniatures, my wish is granted. Watching the movies, I do not remain a crouching giant: the camera brings me down and into the horrifying and fantastical world of the set--at doll level. The movie miniature gives me a taste of shrinking, but in the safety of a virtual city. A simulated city. What it implies about not only simulation, but power, privilege, sexuality, and the urban experience, remains to be seen.¹⁸⁵

Model photography in the cinema industry turns into a very specialized way of visualizing fiction. It is mostly categorized in special effects production and used professionally in forming non-existing cityscapes or spaces. The desired effect is mostly displaying non-existing as real.

4.3 Scientist

4.3.1 The experiment of the Scientist: Sound Photography

Efficiency in terms of time, sources, and money may be the leading factor for the rapid digitalization in the processes of design, construction, and management. Day

¹⁸⁴ Everett Burgess Baker, *An Investigation of the Functional Techniques of Set Designing for Motion Pictures*, M.A. Thesis, The University of Southern California, 1946, 21

¹⁸⁵ Sarah L. Higley, *A Taste for Shrinking: Movie Miniatures and the Unreal City*, *Camera Obscura* 16.2 (2001) 1-35, <https://muse.jhu.edu/article/7969>

by day, projects become more complex, and the tools that the parties use must be more adaptive and precise. However, engineering disciplines, such as structure, heating, lighting, acoustics, followed technological developments more closely due to the increasing competition in the market. For some time, models and photographs became the tools of engineers in scientific tests, and over time they left their tasks to the computer, which was faster and more accurate. However, this transition occurred with the development of relevant scientific theories and the confirmation of the computer's reliability over time. Today, there are systems whose behavior cannot be mimicked by the computer, and in such cases, physical tests are still more reliable. This transformation will be investigated through the progress of acoustic tests, as it shows the underlying logic of visualizing and then measuring things.

In the past, prototypes, small-scale models, and computer models have been used for acoustic measurement of space. The sound was not a phenomenon that could be measured in the early days, but to understand it for the first time, scientists tried to make it visible. Sound is not a visible phenomenon, but they have achieved it in different ways. One of the first experiments was called ultrasonic-schlieren photography, which is explored by Franz Max Osswald. In 1913, Osswald and other scientists experimented with electric sparks, which were used to act as a sound source. In a back-lit and fog-filled cross-section model, the waves of electric sparks were more intense so that they could be detected by photography. In later periods, water waves created by a mechanical vibrator in shallow water and the reflections of rays emanating from the light source were able to simulate sound waves visually and the photograph was the way to record it. Listening tests were impractical and time-consuming, using electrical spark as a sound source gave faster measurable results.

In 1934, 3-dimensional 1/5 scale models were used, while in the 1970s, models were reduced to 1/50 scale. In the 1950s and 60s, models for the simulation of opera and concert halls began to be used professionally. Over time, concepts related to acoustics were developed, and issues such as reverberation became measurable. The first computer models emerged in 1967, and in the 1990s, this digital method began

to be accepted as a reliable and fast method.¹⁸⁶ These changing methods have had an impact on architecture. In the 18th century, large halls with a rectangular plan were common. At the beginning of the 20th century, fan-shaped plans started to be used since it could provide more seats for viewers. In time, the acoustical insufficiency of this plan began to be understood, and after the 1980s, rectangular and terraced halls were accepted as acoustically suitable spaces.¹⁸⁷

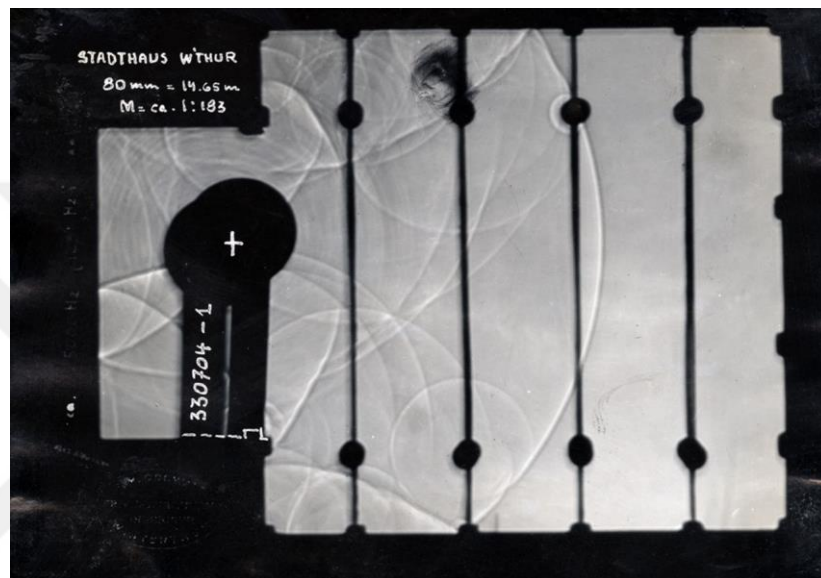


Figure 4.9 Franz Max Osswald, sound test in a horizontal model of Gottfried Semper's Stadthaus Winterthur auditorium, 1933.

In recent years, Sabine von Fischer, who is an architectural historian and architect, published an article about schlieren photography. The author finds this photographic method impressive, making it possible to measure objectively by making a visible phenomenon visible. She considers this method to be the predecessor of today's methods, such as "noise map and climate register." Schlieren was one of the methods

¹⁸⁶ Rindel, Jens Holger, "Modelling in Auditorium Acoustics – From Ripple Tank and Scale Models to Computer Simulations", Keynote Lecture, Forum Acusticum, Sevilla, 16-20 September 2002. Proceedings CD-ROM, paper KL-04

¹⁸⁷ Mike Barron, "Then and now – How Concert Hall design of the 1960s and '70s compares with the present", Paper presented at NAG/DAGA 2009 International Conference on Acoustics, Rotterdam, Netherlands, 23.03.09 - 26.03.09, 4-9.

for visual representation besides spectrography, phonophotography, melography, and oscillography, which captures different parameters of the sound. Fischer has researched unknown photographs of Franz Max Osswald in the archives of the Swiss Federal Laboratories. Osswald is Switzerland's first acoustic specialist and founder of applied acoustic laboratories. With the introduction of electroacoustics in the 1930s, Osswald's method was no longer valid.

Although Schlieren photography is already obsolete in the field of acoustics, it is an experiment far ahead of its age because it makes the sound phenomenon visible. This photo is a method that allows experts to share their knowledge with non-experts later. It continued to take part in the communication and persuasion of other teams involved in the design of the halls, such as engineers and architects.

The physical transfer of acoustic energy to scientific imagery as an expert's representation of sound, and the translation of the gray shadows back into what we can hear but not see, challenges our understanding of physics and the environment. Sound no longer appears ineffable but is transcribed in graphic representation. I realized that such images are crucial for communicating environmental phenomena such as the movement of air, temperature, and sound. Architectural sound photography, as this essay will show, was as much about dispelling the mysteries surrounding sonic phenomena as it was about implanting architectural design in the impenetrable registers of the science of physics.¹⁸⁸

4.4 Archivist

4.4.1 Documents in the School: Bauhaus

“The model was there from the start as part of the Bauhaus manifesto in 1919.”¹⁸⁹

It is accepted that Bauhaus has had a significant influence on the model being a frequently used tool in architectural practice and education today. Unlike other

¹⁸⁸ Sabine von Fischer, Visual Imprint of Moving Air: Methods, Models, and Media in Architectural Sound Photography, ca. 1930, JSAH, 76:3 (September 2017)

¹⁸⁹ Morris, *Models: Architecture and the Miniature*, 19

educational institutions at the time, the combination of theoretical and practical education in the curriculum and the students going through basic design education in the first year were among the leading methods of the school. The school could not last long due to the political pressures in Germany during that period and finally, it was closed in 1933. Bauhaus was not the only avant-garde school of its time. Vkhutemas, which was established in Russia, also included a basic design course and followed an applied art education. It was likewise closed by political pressure. Although not regular, relations were established between these two schools through people.

Bauhaus's pedagogical approach and the use of workshops in the education of architecture are explained through the contrasting approach of the prestigious Beaux-Arts education system. Beaux-Arts regarded architecture as a part of fine arts, and the architect was expected to design on the paper. Beaux-Arts education began in the 1830s, continued until 1968, and had a long-lasting impact on other schools in Europe and America. While Beaux-Arts was having a golden period at the beginning of the 20th century, Bauhaus was aiming to combine arts and crafts in contrast to the Beaux-Arts system. In the newly created training program of Bauhaus, the model was an essential part of Vorkurs, which is the basic course of design education. The use of the model came to the forefront instead of designing on paper. German culture should have been effective in the formation of the Bauhaus system. Kindergarten schools and toys like Froebel blocks used in this school are considered to have an impact on the culture of designing through tactile and visual play.¹⁹⁰

After the closure of Bauhaus by the National Socialist Party, its founders and teachers immigrated to America and Europe and found the possibility to work and spread Bauhaus methods at new schools. Another factor influencing this spread was the publications of Bauhaus. The series of books that teachers wrote and designed themselves, Bauhaus newspaper, sales catalogs known as *Katalog der Muster*,

¹⁹⁰ Morris, *Architecture and the Miniature*, 43-5

contributed to the recognition of Bauhaus in the world. Bauhaus publications were designed as a whole, in line with the school's general approach.

Good quality photographs were frequently used in these publications. Photography became one of the art branches taught at Bauhaus in 1929. One of the photographers of this period was Lucia Moholy. In an article published in 2014, the author discusses Lucia Moholy's role in creating the Bauhaus legacy.¹⁹¹ Moholy was the wife of Laszlo Moholy-Nagy and was not professionally involved in Bauhaus. She learned photography in a professional studio and was teaching photography in another school. It is not clear whether she was given an official assignment for the shooting of Bauhaus, but it is argued that she began this mission by an oral agreement with Gropius. She was not paid for this work, and the negatives could be used by the staff for the publications. One of these publications was *Neue Arbeiten der Bauhauswerkstätten* (New Work of the Bauhaus Workshops, 1925), which included 38 photographs taken by Moholy.¹⁹²

Lucia Moholy took iconic architectural photographs of Bauhaus's newly built buildings and students' work between 1924-1928 with a professional approach. Student works included industrial products, sculptures, and architectural models. These photographs were mature works in terms of photographic art and were considered to belong to the style of “sachlich (objective) photography.” These photographs were used in publications, even though they were not cited to Moholy. She was preparing the background, composition and lighting of the photographs carefully. The composition of the industrial products was designed with the purpose of bringing mass production to mind. The objects were shot in groups, or with the

¹⁹¹ Robin Schuldenfrei, “Images in Exile: Lucia Moholy's Bauhaus Negatives and the Construction of the Bauhaus Legacy”, *History of Photography*, 37:2, (2013), 182-203, DOI: 10.1080/03087298.2013.769773

¹⁹² Ibid, 182-6.

shadows and reflections created by light beams and mirrors. Moholy created an archive of 560 glass negatives from this period.

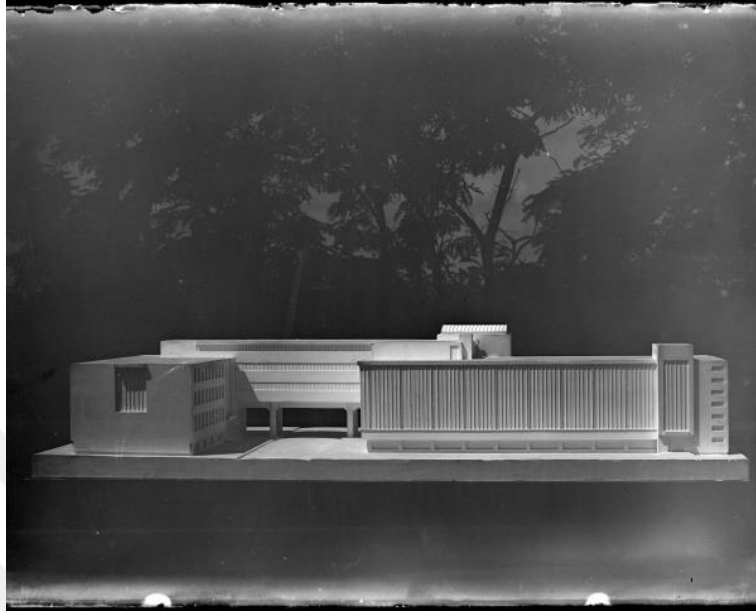


Figure 4.10 Bauhaus building Dessau, model, 1925 – 1926. Walter Gropius (Architect), Lucia Moholy (Photography (??))

Source: <http://open-archive.bauhaus.de>, [last access on 27.01.2020]

In the 1930s, Bauhaus members fled abroad and did not always have the opportunity to carry their belongings and designs with them. Lucia Moholy's marriage ended in 1929, and in 1933 she had to flee abroad without taking the archive with her. Since she did not have a portfolio, she had to start her career in England from scratch.¹⁹³ After a long time, she learned that her negatives were safe in the house of Gropius in the USA in 1954. The possession of the negatives turned out to be a matter in dispute between Moholy and Gropius. Gropius was saying, “You will imagine that these photographs are extremely useful to me and that I have continuously made use of them, so I hope you will not deprive me of them” in his letter to Moholy.¹⁹⁴

¹⁹³ Ibid, 189.

¹⁹⁴ Ibid, 195.

Laszlo Moholy-Nagy also gave importance to photography and used it effectively in his works. While Gropius started working at the Department of Architecture at Harvard University, Moholy-Nagy immigrated to Chicago and got involved in the establishment of “the New Bauhaus” school in 1937 with the reference of Gropius. With the influence of investors, the school’s name was later changed to the “American School of Design.” In an article written about this period, it is explained that it was not easy for Moholy-Nagy to establish a European based pedagogy system in the USA, that he had to respond to criticisms and modify the educational system according to the relations with investors.¹⁹⁵

Photography was also an essential educational tool in this school. Student works of this period were recorded with photographs and used in publications such as *The New Vision: Fundamentals of Bauhaus Design, Painting, Sculpture, and Architecture*. Moholy-Nagy initiated the Photogram technique and the use of this method was later used for the war industry. Photogram was a technique of creating compositions with light and shadow, and it was used for the application of camouflage in military aerial photographs. According to the article, a newspaper article from 1942 explained how the photography education given at this school was used to create military illusions. With this method, the light passing through a wooden model was creating the desired shadow.¹⁹⁶

The experience of the photographic documentation of Bauhaus works shows that they have a crucial role in displaying the legacy of Bauhaus. The school could not last long; any of the industrial products designed in the school could not get reproduced. The teachers and students had to take refuge in other countries. Most of the items belonging to the school could not get out of the country, and many possessions were destroyed during the war. Only the photographs, most of which

¹⁹⁵ Emma Stein, “Laszlo Moholy-Nagy and Chicago’s War Industry: Photographic Pedagogy at the New Bauhaus”, *History of Photography*, 38: 4, November 2014, 398-400, <http://dx.doi.org/10.1080/03087298.2014.949487>

¹⁹⁶ Ibid, 406-9.

were model photos, could represent the experience of Bauhaus in detail. The photographs were the most informative display items at the 1938 MoMA exhibition curated by Herbert Mayer.¹⁹⁷ In the case of Bauhaus, photography turned out to be the most critical informative medium in delivering the significance of the school in history.

4.5 Media Expert

Unlike the architectural photograph, which records mostly existing places, the model photograph belongs to the imaginary world of design. This distinction allows the model photograph to gain both photographic and pictorial features, which will be examined in this chapter. Model photography has similar features with the other images of imaginary/visionary architecture, like digital renderings of virtual environments opposed to the photography's general claim on objectivity. Kester Rattenbury, who is an architectural journalist and professor, gives many examples for visionary architecture in the book she edited, *This is Not Architecture: Media Constructions*. She summarizes her view for the role of visionary projects in architectural culture as follows:

“Unbuilt, imaginary, iconoclastic projects (Tatlin's Tower, Zaha Hadid's The Peak, most Italian Futurism, Piranesi, Archigram – you name it) have a roughly equivalent place in the architectural canon, as it is set out in books and magazines and lectures, as-built iconoclastic projects – sometimes a greater one.”¹⁹⁸

The book, *Visionary Architecture*, is a collection of images of unbuilt architecture, prepared by Ernest Burden, who is an architect and marketing communications specialist in the design industry. He tells that the term “the visionary” recalls “the idealistic, the Utopian, the impractical, the dreamer,” but at the same time, he points

¹⁹⁷ Robin Schuldenfrei, “Images in Exile: Lucia Moholy's Bauhaus Negatives and the Construction of the Bauhaus Legacy”

¹⁹⁸ Rattenbury, *This is not Architecture*, xxi

at the ability to anticipate the not-known and striving with the forces of the non-existent realities.¹⁹⁹ The model film stills from *Metropolis* (1927) are among other visionary images, such as drawings of Piranesi and Frank Lloyd Wright.

The manipulation of model images like the filming of miniatures can create imaginary landscapes. This process also may provoke feelings of ecstasy or create awareness of situations that can be sensed but cannot be seen clearly yet, as in the case of utopia/dystopias.

4.5.1 Publicity: 1939 New York World's Fair

In the 1930s, there was a raised interest in both industrial design and public relations, and they were emerging as professions in America. People were witnessing many national and regional fairs in these years, but it was the 1939 New York Fair in which promotional activities reached their highest level. The fair was designed with the theme of “the world of tomorrow” and one of its purposes was to promote commercial products of the firms. One prominent aspect of the fair was the start of the Second World War during the fair was active. While Europe was boiling politically and militarily, the entertainment industry in America was making new success. It can be said that the fair has been successful in public relations; over 44 million people are said to have visited the fair.

The most popular exhibition of this fair was the Futurama exhibition, owned by General Motors, designed by Norman Bel Geddes. Futurama was the exhibition of a giant model that was built on an area of 3320 square meters, which showed how the rural and urban areas of America would be in 1960. Futurama contained approximately 500,000 individually designed houses, more than 1,000,000 trees of eighteen species, 50,000 scale size automobiles, of which 10,000 actually worked, bridges, farms, rivers, cities, lakes, forests, superhighways, and snow-capped mountains. There were other model displays in the fair; however the experience of Futurama was far different from other exhibitions. General Motors was emphasizing that civilization was dependent on the development of transportation and assumed that in the

¹⁹⁹ Ernest Burden, “Preface”, *Visionary Architecture: Unbuilt Works of the Imagination* (Mcgraw-Hill, 1999), v

future, there would be a world dominated by highways and cars in America. Bel Geddes, who regarded himself as the designer of the future, transformed this exhibition from being an ordinary exhibition to an eye-catching show.²⁰⁰



Figure 4.11 Norman Bel Geddes' Futurama, New York World's Fair, 1939

The design and construction of the mockup was a big issue; on the other hand, the design of the audience's experience was also crucial for Bel Geddes. He had experience in stage design before, so he designed the viewing experience to impress the viewers. The audience was entering a building with a twisting ramp²⁰¹ and they could not understand what was happening inside. After entering, an impression with light effects was created that they were entering into a different world. The audience sat on the seats that were moving on a line; a voice was telling the story of the future while moving. The form of the seats narrowed the viewer's gaze, and the fast-moving seats restricted their attention from shifting elsewhere. At the end of the journey,

²⁰⁰ Roland Marchand, "The Designers Go to the Fair II: Norman Bel Geddes, The General Motors "Futurama," and the Visit to the Factory Transformed", *Design Issues*, Vol. 8, No. 2 (Spring, 1992), 22-40

²⁰¹ Belles collaborated with Eero Saarinen for the design of this ramp.

they got closer to a section of the city model and saw how pedestrian and car traffic was organized on a human scale. When they got up from the seats, the viewers found themselves in a model of 1/1 scale of the previously seen model, and they experienced the feeling of traveling in time.²⁰²

The theme of this exhibition was based on a smaller scale model made by Bel Geddes for Shell Oil in 1936. A close-up of this model was taken, and pedestrian and vehicle traffic divided into layers on a city scale were presented as if it were real. In 1939 Bel Geddes persuaded another company to implement the idea of a big model show, but the company had to withdraw from the fair. While GM planned to promote this exhibition by simulating a production line as it did in the past, Bel Geddes started building this exhibition when he managed to convince the company. During this period, through public relations, fairs were not informative and turned into mass entertainment.²⁰³

One of Bel Geddes' competitors at that time believed that this project was impossible because it required resources that could not be realized in a short time. There were many mock-ups in the project, and the whole design was checked by Bel Geddes. In order to ensure realism, he allowed its employees to make observations over a city by plane and insisted on detailing the model according to their notes. The exhibition was held despite the budget overrun, and it managed to attract significant attention at the fair. It was recorded that a total of 5 million people were watching Futurama. With the interest Bel Geddes created, he was ahead of companies such as Ford, Du Pont.²⁰⁴

This ambitious project had been successful in creating the impact it wanted. The project's foresight about the companies was surpassed in 20 years time. The project predicted that there would be 38 million cars in America in 1960; in reality, it would

²⁰² Roland Marchand, "The Designers Go to the Fair II: Norman Bel Geddes, The General Motors "Futurama," and the Visit to the Factory Transformed", 22-40

²⁰³ Ibid

²⁰⁴ Ibid

be 74.4 million cars. Skyscrapers were built in cities, and highways quickly linked cities.

Futurama exhibition is an example of watching the model from above, like observing a city from an airplane rather than an example of model photography. The video of the Futurama exhibition has also been shot, and it can be said that it remains impressive today. The city images presented in both the Futurama video and the Metropolis movie were persuasively presenting the spaces that would be defined as utopia or dystopia. However, it is ironic that these were narratives that describe different worlds and have different political views. Special effects technologies developed in Germany at the time of Metropolis started to be used and further developed in the United States of America. Hollywood entertainment sector, which is still a significant sector today, started to grow in those times. In the production of films, the models are still used in scenes where the virtual replicas are not satisfactory enough in aesthetical terms. The Futurama exhibition proved its success in the presentation of the city's urban planning. Today, models of cities continue to be presented in Expos and similar exhibitions and these presentations are generally supported with the latest technology available.

CHAPTER 5

CONCLUSION

In this thesis, model photography, which has been used in different contexts but has not been evaluated under the framework of a specific definition until the 2010s, is defined as an alternative representational tool with unique visual features. It has been aimed to reveal the common features and functions of model photography in a variety of disciplines used to represent the “unrealized”. The model photographs used by the professional architect in the design process, the photographs of scientific experiment models, and the miniature special effects used in the films can serve a similar purpose: they can be tools for the perception and evaluation of built environments that do not actually exist.

The findings of the thesis will be briefly explained in three parts. In the first part, (5.1) the functions of the model photography that have been examined through the experiences of the actors, will be summarized. In the second part, (5.2) the effects of photography on the model and the changing aspects of the model’s use in architecture will be explained with reference to earlier representational views of models. In the third part, (5.3) the effects of digitalization on model photography will be analyzed briefly and the approaches of the professional architects and professors at academics who prefer model photography over computer-generated images will be mentioned.

5.1 Functions of Model Photography

Model photography has four essential functions in the field of architecture today. As this thesis shows these functions can be observed in the photography of models in art, science and technology. Three of these functions are similar to modelmaking in architecture. The model plays a role in transforming ideas created by the

designer/architect into three-dimensional, physical objects. In the later stages of the design, it takes on the task of being a presentation model so that the design can be explained to audiences. Considering that not only the architect but also the engineer has responsibility in the design and performance of architectural works, it can be seen that the scientific experiments, which are the tools of the engineers, can also be evaluated in terms of model photography. In addition to these three basic functions, photography has the ability to record the model. Therefore, based on the examples mentioned in the previous section, model photography can be considered to have four primary functions: its use as a design, experiment, documentation, and communication tool.

Model photography can be used as a productive tool in the design process of the architect, as it can be seen from Mies van der Rohe's experience. It was surprising to find Medardo Rosso's use of model photography was similar to Mies. The purpose of the artist and the architect was to design the gaze of the viewer, and the model photo can become a necessary tool for the design process. The use of model photography in Gaudi's projects takes place in a process where both the structure and the architectural form are designed at the same time. Photography was just one of the tools in the design process; however, it was the most suitable tool for visualizing the model.

Secondly, the use of model photography for experimentation on more technical issues can be seen as a separate function because this time, some advanced technical features of photography become useful in design. Thanks to techniques such as photogrammetry, measurable, and reliable data can be obtained from the photographic image. Information that cannot be obtained with the naked eye can become accessible with microphotography or infrared photography. The experiments on sound photography and the examples given under the "Simulation" are just a few of many similar examples.

The third essential function of model photography can be seen as documenting. Models can be protected, stored, and presented, but, due to their fragile nature,

models do not get protected in practice. Transferring the task of creating records to photography has made it easier for people to build archives. The most prominent example of documentation in this study was the experience of Bauhaus and Lucia Moholy. These photos were frequently used in books, brochures and magazines promoting the school, which are Bauhaus's designs. The archive of photographs including those of the architectural models created by Moholy had a much more transportability compared to the models themselves and had to be abducted from the country under the severe conditions of the Second World War. Considering Gaudi's archive, which was destroyed in the Spanish Civil War, it can be seen that the archive was saved from possible destruction.

Finally, attention can be paid to the function of the model photo on communication. In the examples given, it can be seen that this tool is used for communication between the actors of the disciplines as well as general public. Like the model, the model photograph also gives information about the model, the architect, and the purpose of the project. In the example of Mies van der Rohe, the architect attaches great importance to introducing the project to the public, and the design of the photography of models is among the architect's duties since this promotion often takes place through photographs that will be featured in magazines.

Futurama exhibition, which has been examined in the thesis, is an example of the city model and its image produced for mass communication. Despite having different messages for their audiences, "Futurama" exhibition and "Metropolis" feature film have many features in common. The city images created by the models and presented in both the Futurama video and the Metropolis film were persuasively presenting the spaces that would be defined as utopia or dystopia.

The functions of the model photograph in the field of architecture have been categorized as above. In most model photos several fractions could be detected. The photos produced for design or experimentation could also be used for archiving or promotional purposes according to its context. The fact that photographic technology is not one-way in function, but on the contrary, it is possible to use it in different

contexts. Model photographs were used actively at the time they were produced, and today they form archives that provide information about the history of architecture.

5.2 The Effect of Photography on Model

This study underlined that, before the intervention of the photograph, the model was an object that the human only could perceive with his/her own senses, body, and mind directly. Human interaction with the model was a direct, mutual, physical event that took place in the actual world. With the effect of miniaturization, people could perceive objects, structures, and relations between them more easily. The model was a useful tool for people to have cognitive control over their environment. The model, like a map or a drawing, could render information accessible by highlighting what it considered important about the referent object. Further, it could compress the information, allowing people to create information systems. It was used both for conveying technical information and as a means of social communication.

The effect of photography on the architectural model is observed in some of the cases in the thesis. Photography of some models became milestones in the history of architecture as Tatlin's Tower and Kocatepe Mosque in Turkey. Photography prolongs the life of the actual model and gains an iconic status. It is said that the most crucial factor in the development of photography is that society and professional sectors needed a reliable and fast imaging tool. The economic and functional value of photography made it an indispensable tool such as pencil and paper in the fields of architecture and engineering. On the other hand, the media became an essential part of public life and professions. The documentation of models through photographs and their dissemination in the media have effected the social life of architectural models irreversibly.

The reproduction of the model through photography causes it to transform according to the characteristics of the secondary medium (photography in the case of model photograph) and causes it to enter into a new context. The introduction of another

tool interferes with the one-to-one relationship between man and model. What one can learn from the one-to-one relationship with the model and learn from the photograph is undoubtedly different. Information based on real experience is replaced by visual information.

When earlier representations of models are compared with photographs, it can be observed that people tend to use similar narratives with similar compositions. The mosaics in the Hagia Sophia and painting of the Gandy's room of models that were mentioned in the thesis clarifies that interpretations of model photographs can have place in the historiography of architecture.

Model photography is not a dominant medium in comparison to architectural photographs and drawings; however, it can be found in many different contexts, such as monographs, periodicals, newspapers, and exhibitions. For the research of this thesis, related archives have been scanned, and it was found that there were many more sources than it was expected. Further studies can be made to understand its role in different periods, different media, and different countries.

The work of photography artists on model photography were given in the thesis to show the potential of model photography, which is different from other representational tools. These artists have developed some methods that cannot be developed in professional architecture. These photographs have been frequently designed to be perceived as photographs referring to the real world.

The model can be used for professional purposes, as well as it can represent spaces created by human imagination. Models of an architecture student are often the only means by which their designs can be physically expressed. In a completely different industry, but likewise, filmmakers and directors produce models that are difficult and expensive to build in 1/1 scale, and thus can create the impression of the real through camera effects. The model enables the production of places that have been tested before construction, or that cannot be constructed in reality or even considered fantastic.

It creates a tension when the relatively free form of expression of modelmaking meets the photographic technique which is expected to be objective. In architectural photography, the building in the photograph refers to a real building, but model photography has the opportunity to create its own reality. The model in the model photograph represents an imaginary building, but it can create the impression of a real building in the photograph. Even if it reveals the presence of the model in the photo, it still can help the viewer to perceive a different reality through the image.

5.3 The Effect of Digitalization on Model Photography

This thesis focused on the analog photographs of physical models until the 1980s and excluded the digital revolution. However the transformation of modelmaking , its recording and displaying are fertile research fields in the field of architectural representation. In general, the claim of newly discovered technologies to replace past technologies is quickly accepted by people. In the past, it was widely claimed that photography killed the picture, and later digital photography also killed photography. However, it was seen that old techniques opened new expression fields to them over time. Model photography is old technology compared to digital visualization methods, and this technique may be able to improve by adapting to new developments in technology.

Some architectural offices and schools think that models, photographs, and computers can collaborate in the design, and images that are visually suitable for today's cultural environment can be produced. The practices that combine these tools provide a transformative environment for model photography. During the research it was observed that model photography can be seen as a viable tool against the practices that rely on digital production techniques. Although architectural offices like OMA, Asymptote, and Caruso St. John have fully adapted to the digital environments, they still use the physical model and its photograph. According to the comments of these offices, different representation tools may be needed in the sophisticated design process, and the different tools used can become the signature

of the offices. Model photos of OMA made with blue styrofoam, giving the impression of being taken during active design and accompanying the narration in many books. Caruso St. John's light, pastel-colored interior model photographs²⁰⁵ are examples of the creative use of this tool.

Architectural schools have model photography in the curriculum in different places. They tend to instrumentalize model photography for different design problems and present the results in contexts such as exhibitions or articles. In these kinds of experiences, it is argued that architectural education can be enriched by integrating digital tools, models, and photographs that have created a certain accumulation in forms of expression until now. It is emphasized that the camera and digital visualization programs are now more accessible, so the student can be encouraged to use model photography in observation, analysis, and design.

The criticism of "not using abstraction properly" for digital images can also be applied to model photography. The model photograph, by nature, displays an artificial environment. This photograph can display the model with its artificiality, or it can also have aesthetic concerns such as evaluating lighting, background, viewpoint, and detailing. The model photo pretending to be a real architectural photograph without notice has no contribution to model photography. There are model photographs that successfully make use of abstraction with the control of light and details. Although architectural photography and digital images seem to be popular in architectural culture today, model photography still creates a potential for the representation of architecture, as we have seen in alternative practices. Despite the fact that digital models, virtual reality, augmented reality; physical models still live and many examples of their photographs can be seen in the architectural publications.

²⁰⁵ Pedro Engel. "Envisioning architecture interiors through model photography: Caruso St John – Architects". EAEA-11 conference 2013.

REFERENCES

- Ackerman, James S. "On the Origins of Architectural Photography." In Kester Rattenbury (ed.), *This is not Architecture*. London: Routledge, 2002, 34- 35.
- Ak, Seyit Ali. *25 Yılın Türk Fotoğraf Tutanağı (1960-1985)*. İFSAK, İstanbul, 1987.
- . *Erken Cumhuriyet Dönemi Türk Fotoğrafı (1923-1960)*. Remzi kitabevi, İstanbul, 2001.
- Allen, Stan. "Terminal Velocities: The Computer in the Design Studio." in John Beckmann, *The virtual dimension: architecture, representation, and crash culture*, New York: Princeton Architectural Press, 1998.
- Ander, Gregg D.. *Daylighting Performance and Design*. New York: Van Nostrand Reinhold, 1995.
- Arpak, Aslı. *Physical and virtual: Transformation of the architectural model / Fiziksel ve sanal: Mimari modelin dönüşümü*. Unpublished M.A.Thesis, Orta Doğu Teknik Üniversitesi / Fen Bilimleri Enstitüsü / Mimarlık Anabilim Dalı, 2008.
- Bacci, Francesca. "Impressions in Light: Photographs of Sculptures by Medardo Rosso (1858-1928)". Unpublished Ph.D. Thesis in The State University of New Jersey, Graduate Program in Art History, 2004.
- Bachelard, Gaston. *The Poetics of Space*. Boston: Beacon Press, 1994.
- Bailey, Douglass. *Prehistoric Figurines. Representation and Corporeality in the Neolithic*. London: Routledge, 2005.
- Bancı, Selda. "Printed Architectures: Architects' Auto-Monographs In Turkey, 1950s-1980s". Published Ph.D. Thesis, METU, Architectural History, 2016.

- Batchen, Geoffrey. *Each Wild Idea*, Writing, Photography, History. The MIT Press: Massachusetss, Cambridge, 2000.
- . “Phantasm Digital Imaging and the Death of Photography” *Aperture*, No. 136, *Metamorphoses: Photography in the Electronic Age* (Summer 1994).
- Berger, John. “Understanding a Photograph”. In Trachtenberg, Alan (ed.), *Classic Essays on Photography*. New Haven, conn.: Leete’s Island Books, 1980.
- Benjamin, Walter. “A Short History of Photography” in *Classic Essays on Photography*, edited by Alan Trachtenberg, New Haven: Leete’s Island Books, 1980. 199–216.
- . “The Work of Art in the Age of Mechanical Reproduction.” In *Illuminations: Essays and Reflections*, edited by Hannah Arendt. New York: Schocken Books, 1969, 217-251.
- Bergera Serrano, Iñaki. *Modelling for the Camera: Photography of Architectural Models in Spain 1925-1970*. (2016)
- . “Photography and Modern Architecture: A Distinctive Narrative from Spain” in *RIBA Journal of Architecture*, 21:7, November 2016.
- . “Retratando Sueños. Fotografías De Maquetas De Arquitectura Moderna En España” [Portraying Dreams. Photographs Of Modern Architecture Models in Spain]. N15 “Maquetas”. Noviembre 2016. Universidad de Sevilla. DOI: <http://dx.doi.org/10.12795/ppa.2016.i15.02>
- Bollinger, Klaus and Florian Medicus. *Unbuildable Tatlin?! Birkhauser: Wien, Austria*, 2012.
- Boym, Svetlana. “Ruins of the Avant-Garde” in Julia Hell, Andreas Schönle (eds.), *Ruins of Modernity*. Duke University Press, 2010.
- Busch, Akiko. “True or False: Model Photography Is High Art” in *Architectural Record*, v.180, n.5, 1992, 34-36.

Cachola Schmal, Peter and Oliver Elser (Eds), *Das Architekturmodell: Werkzeug, Fetische, Kleine Utopie / The Architectural Model: Tool, Fetish, Small Utopia*, Scheidegger and Spiess; Bilingual edition, 2012.

Colomina, Beatriz. "Le Corbusier and the Everyday Image of the Industrial Age" in Michael Hays, (ed.) *Architecture Theory Since 1968*. The MIT Press, 2000, 627.

———. "Media as Modern Architecture", in *Thomas Demand*. London: Serpentine Gallery, 2006, 19–46.

———. "Mies Not" in Detlef Mertins, ed., *The Presence of Mies*. New York: Princeton Architectural Press, 1994.

———. co-ed. "Introduction: On Architecture, Production and Reproduction," in Joan Ockman (ed.), *Architectureproduction*. New York: Princeton Architectural Press, 1998, p.66.

———. *Privacy and Publicity: Modern Architecture as Mass Media*. Cambridge: MIT Press, 1994.

Coulton, J. J. *Greek Architects at Work: Problems of Structure and Design*. Cornell University Press, 1982.

Crary, Jonathan. *Techniques of the Observer: On Vision and Modernity in the 19th Century*. October Books. Cambridge: MIT Press, 1990.

De Mare, Eric. "Photography and Architecture" in *Photography and Architecture*. London: The Architectural Press, 1961, 17-20.

Deriu, Davide. *Modernism in Miniature: Points of View*. Exhibition held in Canadian Centre for Architecture, 2012.

<https://www.cca.qc.ca/en/events/3161/modernism-in-miniature-points-of-view> <http://www.nottinghamcontemporary.org/event/davide-deriu>

- . “The Architectural Model In The Age of its Mechanical Reproducibility.”
Proceedings Of The 2nd International Conference Of The European
Architectural History Network. Hilde Heynen & Janina Gosseye (eds.)
Brussels, 31 May - 2 June 2012.
- . “Transforming Ideas into Pictures: Model Photography and Modern
Architecture” in Higgott, Andrew, and Wray, Timothy (eds.), *Camera
Constructs: Photography, Architecture and the Modern City*. (Ashgate,
Farnham, 2012).
- Derviş, Pelin and Selva Gürdoğan. “Düşünme ve Görselleştirme Aracı Olarak
Türkiye’de Mimari Maket” in *Arredamento Mimarlık* 2018, No: 318.
- Eisenman, Peter. *House X*. Rizzoli, 1983.
- Elwall, Robert. *Building with Light: The International History of Architectural
Photography*. London: Merrell. (rev. ed., 1953), 2004, 8.
- Engel, Pedro. “Envisioning architecture interiors through model photography:
Caruso St John – Architects”. EAEA-11 conference 2013
- Enwezor, Okwui and James Casebere. *James Casebere: Works 1975-2010*, 2011.
- Ertan, Güler. *Dünden Bugüne Fotoğraf*. İstanbul Kültür Üniversitesi (İKÜ)
Yayınevi, 2009.
- . *Fotoğraf Sanatı ve Türkiye /Cumhuriyet Sonrası Türk Fotoğrafı*. Marmara
Üniversitesi Güzel Sanatlar Fakültesi Toplantı Notları, Siemens Yayınları,
İstanbul, 1995.
- Evans, Christopher. “Small devices, memory and model architectures: Carrying
knowledge”, *Journal of Material Culture* 17:4, 2012.
- Fabricius, Daniela. “Material models, photography, and the threshold of
calculation” in *Arq*, 21.1, 21–32. Cambridge University Press, 2017.

- Floris, J., Teeds, H. (). On Models and Images. An Interview with Adam Caruso In Journal for Architecture OASE #84 - Models. Rotterdam, The Netherlands: NAI Publishers, 2011.
- Foxhall, Lin. "Introduction: miniaturization". World Archaeology Vol. 47(1): 1–5 Miniaturization. <http://dx.doi.org/10.1080/00438243.2015.997557>
- Förster, Simone. "Hypermodelle. Fotografie und Modell als Formen der Darstellung von Architektur und gebautem Raum" in *Raum - Dynamik / dynamique de l'espace: Beiträge zu einer Praxis des Raums / contributions aux pratiques de l'espace*. Taschenbuch, 2004, 315–324. <https://doi.org/10.14361/9783839402511-021>
- Frampton, Kenneth and Silvia Kolbowski. *Idea as Model*. Institute for Architecture and Urban Studies: Rizzoli International Publications, 1981.
- Frascari, Marco and Jonathan Hale (Ed), Bradley Starkey (Ed). *From Models to Drawings: Imagination and Representation in Architecture*. Routledge, 2007.
- Giebelhausen, Joachim. "Architekturmodelle vor der Kamera" in *Architekturfotografie*. München, Verlag Großbild-Technik, 1964.
- Grima, Joseph and Thomas Demand. *Thomas Demand: Model Studies I & II*. Walther König, Köln; Bilingual edition, 2016.
- Groat, Linda and David Wang. *Architectural Research Methods*. Wiley; 2 edition, 2013.
- Gropius, Walter and Lazslo Moholy-Nagy, *Internationale Architektur*, Munich: Langen, 1925.
- Günay, Reha. "Türkiye’de Mimarlık Fotoğrafi" in *Arredemento Mimarlık*. 2016/02.
- Healy, Patrick. *The Model and its Architecture*. 010 Uitgeverij, 2013.

- Hell, Julia and Andreas Schönle (eds.). *Ruins of Modernity*. Duke University Press, 2010.
- Higgott, Andrew, and Timothy Wray, eds. *Camera Constructs: Photography, Architecture, and the Modern City*. Surrey: Ashgate, 2012.
- Hillfingier, Harrison. "A Study of the Significance and Application of Special-Effects to the Cinema. M.A. Thesis. The Faculty of the Department of Cinema University of Southern California, 1941.
- Jacobs, Jane. "The Miniature Boom", *The Architectural Forum*, May 1958.
- Janke, Rolf. "Photographing Architectural Models" in *Architectural Models*. Academy Editions: London, 1978.
- Kalshoven, Petra Tjitske. "The World Unwraps from Tiny Bags: Measuring Landscapes in Miniature", *Ethnos*, 78:3, 2013. 352-379. DOI: 10.1080/00141844.2012.688761
- Kanburoğlu, Özer. *Mimari Fotoğraf*. İnkılap Kitabevi, 2008.
- Krauss, Rosalind, "Photography's Discursive Spaces," in R. Boston (ed.), *The Contest of Meaning: Critical Histories of Photography*, Cambridge MA: The MIT Press, 1989, pp. 286-301.
- Korab, Balthazar digital archive:
<http://www.loc.gov/pictures/search/?st=grid&co=krb>
- Knappett, Carl. "Meaning in Miniature: Semiotic Networks in Material Culture." In M. Jensen, N. Johanssen, and H. J. Jensen (eds.), *Excavating the Mind: Cross Sections through Culture, Cognition and Materiality*. Aarhus: Aarhus University Press, 2012, 87–109.
- Knoll, Wolfgang and Martin Hechinger. "Model Photography" in *Architectural Models: Construction Techniques*. J. Ross Publishing, 2007.
- Lambert, Phyllis. *Mies in America*. Harry N. Abrams, 2001.

- Lévi-Strauss, Claude. *The Savage Mind*. University of Chicago Press, 1966.
- Loew, Katharina. “Techno-Romanticism: Special Effects in German Fantastic Films of the Silent Era”, Ph.D. Thesis, The University of Chicago, 2011.
- Lucci, Roberto and Paolo Orlandini. “Photographing Models” in *Product Design Models*. Thomson Learning, 1989.
- Marchand, Roland. “The Designers Go to the Fair II: Norman Bel Geddes, The General Motors "Futurama," and the Visit to the Factory Transformed” in *Design Issues*, Vol. 8, No. 2 (Spring, 1992), 22-40.
- Marcoci, Roxana. *Thomas Demand*. The Museum of Modern Art, 2005.
- Markelin, Antero and Bernd Fahle. *Umweltsimulation: Sensorische Simulation im Stadtebau* [*Environmental simulation: sensory simulation in urban planning*], Kramer, 1979.
- Miller, Wallis. “A Review of Das Architekturmodell: Werkzeug, Fetische, Kleine Utopie. The Architectural Model: Tool, Fetish, Small Utopia”. 24 May – 16 September 2012 Deutsches Architekturmuseum, Frankfurt am Main
Architectural Histories, 1(1): 2, 2013pp. 3-5, DOI:
<http://dx.doi.org/10.5334/ah.ab>
- Mills, Chris B.. “Model Photography” in *Designing with Models: A Studio Guide to Architectural Process Models*. Wiley, 2011.
- Models: The Idea, the Representation and the Visionary. *OASE Journal* 2011, No: 84. <https://www.oasejournal.nl/en/Issues/84>
- Moon, Karen. *Modeling Messages: The Architect and the Model*. New York: The Monacelli Press, 2005.
- Morris, Mark. *Models: Architecture and the Miniature*. Wiley, 2006.

- Morris, Mark. “Worlds Collide: Reality to Model to Reality” in Higgott, Andrew, and Wray, Timothy (eds.), *Camera Constructs: Photography, Architecture and the Modern City*. Ashgate, Farnham, 2012.
- “Neden Maket?” (2017) Panel moderated by Pelin Derviş for “Düşünme ve Görselleştirme Aracı Olarak Türkiye’de Mimari Maket” exhibition. Participants: Akif Ergüleç on behalf of Yusuf Z. Ergüleç, Selahattin Yazıcı, Mehmet Şener, Varjan Yurtgülü and Murat Küçük. <https://www.studio-xistanbul.org/tr/events/meraklisina-tasarim-tarihimiz-kutuphane-bulusmalari-5>
- Oswald, Ansgar. *Architectural Models*. DOM Publishers, 2009.
- Özendes, Engin. “Fotoğrafta 75 Cumhuriyet Yılı”, *Cumhuriyet’in Renkleri, Biçimleri*, Ed. Ayla Ödekan, Türkiye İş Bankası Kültür Yayınları&Türkiye Ekonomik ve Toplumsal Tarih Vakfı Ortak Yayını, İstanbul, 1999.
- Özendes, Engin. *Türkiye’de Fotoğraf*. İletişim Yayınları, İstanbul, 1992.
- Pilz, Oliver. “The uses of small things and the semiotics of Greek miniature objects”. *Pallas*, 86, 2011.
- Porter, Tom and John Neale. “Shooting for Reality” in *Architectural Supermodels*. Architectural Press, 2000.
- Rachel, Marta. “Dressed up and Pasted down: Staged Photography in the Victorian album”, unpublished Ph.D. Thesis, Princeton University, 2008.
- Rattenbury, Kester. *This is not Architecture*, London: Routledge, 2002.
- Sargın, Güven Arif (moderator) “Mimarlık Arşivinde Maketin Yeri” for “Düşünme ve Görselleştirme Aracı Olarak Türkiye’de Mimari Maket” exhibition. Participants: T. Elvan Altan, Pelin Yoncacı Arslan, Saliha Aslan, Elif Bilge. Panel, 2017. <https://www.studio-xistanbul.org/tr/events/meraklisina-tasarim-tarihimiz-kutuphane-bulusmalari-6> [Last access on 28.01.2020]

- Schmal, Peter Cachola (ed) and Oliver Elser (ed). *Das Architektur Modell: Werkzeug, Fetisch, Kleine Utopie / The Architectural Model: Tool, Fetish, Small Utopia*. 2012
- Smith, A. C.. *Architectural Model As Machine*. Amsterdam: Routledge, 2004
- Solomon, Solomon J.. *Strategic Camouflage*, London: John Murray, 1920.
- Stierli, Martino. *Montage and the Metropolis: Architecture, Modernity, and the Representation of Space*. New Haven : Yale University Press, 2018.
- Sturken, Marita and Cartwright, Lisa. *Practices of Looking: an introduction to visual culture*. Oxford University Press.
- Rattenbury, Kester. *This is not Architecture*, London: Routledge, 2002, 125
- Reynolds, Charlotte. “The Fourth Register of Architecture: ‘Model As...’”. The Bartlett School of Architecture, UCL. M.Arch Thesis, 2015.
- Robinson, Cervin, and Joel Herschman. *Architecture Transformed: A History of the Photography of Buildings from 1839 to the Present*. Cambridge: MIT Press, 1986.
- Robbins, Carrie. “Credulous Spectatorship from Zeuxis to Barthes. Ph.D. Thesis, Faculty of Bryn Mawr College, 2013
- Schwarzer, Mitchell. *Zoomscape: Architecture in Motion and Media*. Princeton Architectural Press, 2004.
- Sontag, Susan. “In Plato’s Cave”, *On photography*, New York:Anchor Books, rev. ed., 1977.
- Stewart, Susan. *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection*. Duke University Press Books, 1984.
- Tanyeli, Uğur. *Türkiye’nin Görsellik Tarihine Giriş*. Akın Nalça Kitapları, İstanbul, 2010.

- Tjitske Kalshoven, Petra. "The World Unwraps from Tiny Bags: Measuring Landscapes in Miniature", *Ethnos*, 2013, 78:3, 352-379, DOI: 10.1080/00141844.2012.688761
- Ursprung, P.. Images. In Caruso St John, Almost Everything. Barcelona: Ediciones Poligrafa, 2008.
- Van Gelder, Hilde and Helen Westgest. "Place and Space in Photography. Positioning toward virtual places and spatial objects" in *Photography Theory in Historical Perspective*. Wiley-Blackwell.
- Vidler, Anthony. 'Staging Lived Space: James Casebere's Photographic Unconscious', in C. Chang, J. Eugenides and Anthony Vidler, *James Casebere: The Spatial Uncanny*. Milan: Charta, 2001.
- Von Gerkan, Meinhard and Marg und Partner (Ed). *Idee und Modell /Idea and Model: 30 Jahre Architekturmodelle /30 Years of Architectural Models*, 1994.
- West Brett, Donna. "Banality, Memory and the Index: Thomas Demand and Hitler's photographer", *Photographies*2, 016, 9:3, 233-249, DOI: 10.1080/17540763.2016.1202132.
- Zimmerman, Claire. "Modernism, Media, Abstraction: Mies van der Rohe's Photographic Architecture in Barcelona and Brno (1927-31)". Ph.D. Thesis, The City University of New York, Art History, 2005.
- Zinguer, Tamar. "Architecture in Play: Intimations of Modernism in Architectural Toys, 1836-1952", Ph.D. Thesis, The School of Architecture, Princeton University, June 2006.