1-1-2013

Modelling Architecture: Engaging Our Imagination Through Architectural Models

Michael P.K. Yau
Ryerson University

MODELLING ARCHITECTURE:

ENGAGING OUR IMAGINATION THROUGH ARCHITECTURAL MODELS

Michael Pak Kei Yau
Bachelor of Architectural Science, Ryerson University, 2008

A design thesis project presented to Ryerson University
in partial fulfillment of the requirement for
the degree of Master of Architecture in the Program of Architecture

Toronto, Ontario, Canada, 2013

Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I authorize Ryerson University to lend this thesis to other institutions or individuals for the purpose of scholarly research

Michael Pak Kei Yau

I further authorize Ryerson University to reproduce this thesis by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

Michael Pak Kei Yau

I understand that my thesis may be made electronically available to the public.

Michael Pak Kei Yau

Abstract

Architectural models have always served the purpose of communication. They can be seen as measurements of the body against the current world and projecting into the future. Recent architectural practices saw increasing use of digital drawings and models in design process. This altered the intension of models, transforming some into spectacles that pleases only the eye. The purpose of this thesis is to understand the operation of the architect and the role of physical models in the current architectural discipline. Models clarify our understanding of our bodies, and help provoking and extracting our imaginations. They stimulate our imaginations using our bodies and senses. This thesis is a record of a process. It documents the executions, observations, and speculations concluded from a series of exercises orientated towards the understanding of the use of architectural models and their effects toward our imagination and body, both physically and psychologically.

Acknowledgements

I would like to thank my thesis supervisor Albert C. Smith for his extensive knowledge and unparalled guidance throughout this thesis year, especially for his enthusiasm and patience that inspiried me even in times of doubt from myself.

Also to my second reader Kendra Schank-Smith for her experience and advise. To June Komisar and other members who appeared on my panel throughout the many reviews for their insightful feedbacks.

Lastly, I would like to thank my parents for all their uncondition love and support. To my brother Patrick for his transporation and occassionally being an ‘all-nighter buddy’. Special thanks go to my girl friend Zella for all her support, encouragement, and her advices in pointing out what I cannot see alone, especially for all her time spent editing my writing when she was on holiday in Hong Kong.

I would not be able to pull through this thesis without them.

List of Illustrations

All other illustrations in appendices unless otherwise noted are produced by the author.

Table of Contents

Notes on the structure of the book:

In coupling with the central theme of design though the process of making, this thesis presents itself in the form of a ‘diary’. It is both a documentation of the development of the thesis and a demonstration the thesis’s theme.

The chapters are structured in a sequential format that builds towards the final chapter, which presents the conclusions of a process. The first three chapters discuss issues regarding the changing perceptions of representations, and the engagement of imagination using the body and senses. The chapters are each accompanied by essays that reflect upon the design explorations compared to the respective topics. The intension is to stimulate a dialogue between the design explorations and the research.

In chapter one, titled ‘vision’, the discussion initially focuses on the issues of changing architectural perception since the introduction of computers to assist architectural design. It then provides background on the topic of understanding cognition processes and the way human perceive space. Chapter two is titled ‘experience’ and the discussion is primarily based on Martin Heidegger’s influential theory on ‘being’ and the human experience. This topic will be accompanied by a further discussion on similar view about the human body and senses from architect and critic, Juhani Pallasmaa, who share the same interests. Chapter three, titled ‘imagination’, looks at the subject of imagination and interprets how the discussions from both chapter one and two plays a role in the formation of human imagination and creative faculties.

Three short essays follow their corresponding chapters and are based on the design explorations conducted throughout the thesis. The first essay investigates the concept of machine, which responds to the change in of our perceptions through the use of computers. The second involves the role of memory in response to our instinctive learning capabilities through the body memory. The third explores notions by philosophers concerning play, which corresponds to the imaginative mind and its influence over the creative process.

Chapter four brings the first three chapters, and their accompanying essays, together to provide a synthesis about key concepts to engage the architect's imagination.

Introduction

Architecture is a process. Each model, drawing, and even built building, is a milestone, showcasing the evolution of an architect's philosophical development through design. The initial inspiration process prior to the design development stage is particularly important, as it represents our imaginations. Traditionally, architectural representations have always been physical models, sketches, and typical drawings of sections, elevations, plans, and perspectives. The understanding of representation, particularly in this thesis, refers to any form of visual analogy and constructive metaphor that defines and references a person, a thing, and even an idea (Smith, 2004, xvi).

The forms of architectural representation have evolved from mimicking physical action, to drawings, sketches, and models, to the present use of 3-D renderings using computers, and simulators. Today, the speed of drawings production has increased dramatically. Technologies have hugely improved our capabilities to produce representations in preparation for construction. We no longer learn the same way or understand the world, including architecture, in the same manner.

Representation in general is a primary form of communication for humanity (fig i) as it is our way to express feelings and emotions; in the same time it develops our knowledge by helping us to understand the world (fig ii). Feelings and emotions can be expressed in multiple disciplines and media such as art, dance, and music. From historical archeological findings, many prehistoric rituals involved expressions of humanity through dance, music, and visual art as symbols referencing the body and the natural environment. As art historian E.H. Gombrich described, "somewhere there remains the absurd feeling that what one does to the picture is done to the person it represents" (Gombrich, 1985, 20). These activities often involve the body directly. In the same time, our bodies respond intuitively to music we hear, movement we sense, and pictures we see. However, in this new age of technology

Figure i (opposite): The 'Panel of hands' wall paintings in the El Castillo cave in northern Spain, made at least 40,000 years ago by blowing or spitting paint onto the wall.

where methods of expression have become diversified and are no longer limited to any rituals, it becomes questionable how we should see and respond to this world. Do we see the content? Or do we simply see images?

The ancient Greeks referenced built buildings and paradeigmas as template for architecture, as they believed drawings lacked accuracy and precision. During the era of the medieval master builders, built buildings were traditionally seen as full scale models where as drawings were still in their early stages of development. Since then, architectural representations have evolved and changed and they are now extremely diversified. Current digital tools are capable of processing massive volumes of parameters much faster than traditional representations. In architecture, what we are witnessing, is a change in the use of the computer as a supporting tool to a design environment. Architects have experienced a shift from the representation of architectural ideas for content to the presentation of virtual data as artifacts, a move that is increasingly intensifying. Many architectural projects are becoming digitalized, relying heavily on the precision, novelty and speed provided by the computer. Students too, many influenced by “Starchitects” or blinded by the manufactured spectacles, have become obsessed with the idea of speculating the physical world through visual sense alone. This trend, unfortunately, is becoming fashionable amongst the architectural profession.

This thesis presents that I believe physical models hold an advantage over other representations and act as the dominanting method of representation during the initial design process. Models facilitate architects’ imaginations. A model’s physical and material existence allows a more imitate relationship between architects’ imaginations and their bodies and their senses of touch, sight, sound, smell, and even taste. They aid architects, as a bridging device, in translating

Figure ii (right): The Aztec calendar stone, a monolithic sculpture believed to be made by the Aztec people. The image on the stone is thought to represent days and months, or geographic significance.

their imaginations to the physical and material world. During this process, our bodies and all of our sensory receptors are the primary ways to grasp what we imagine.

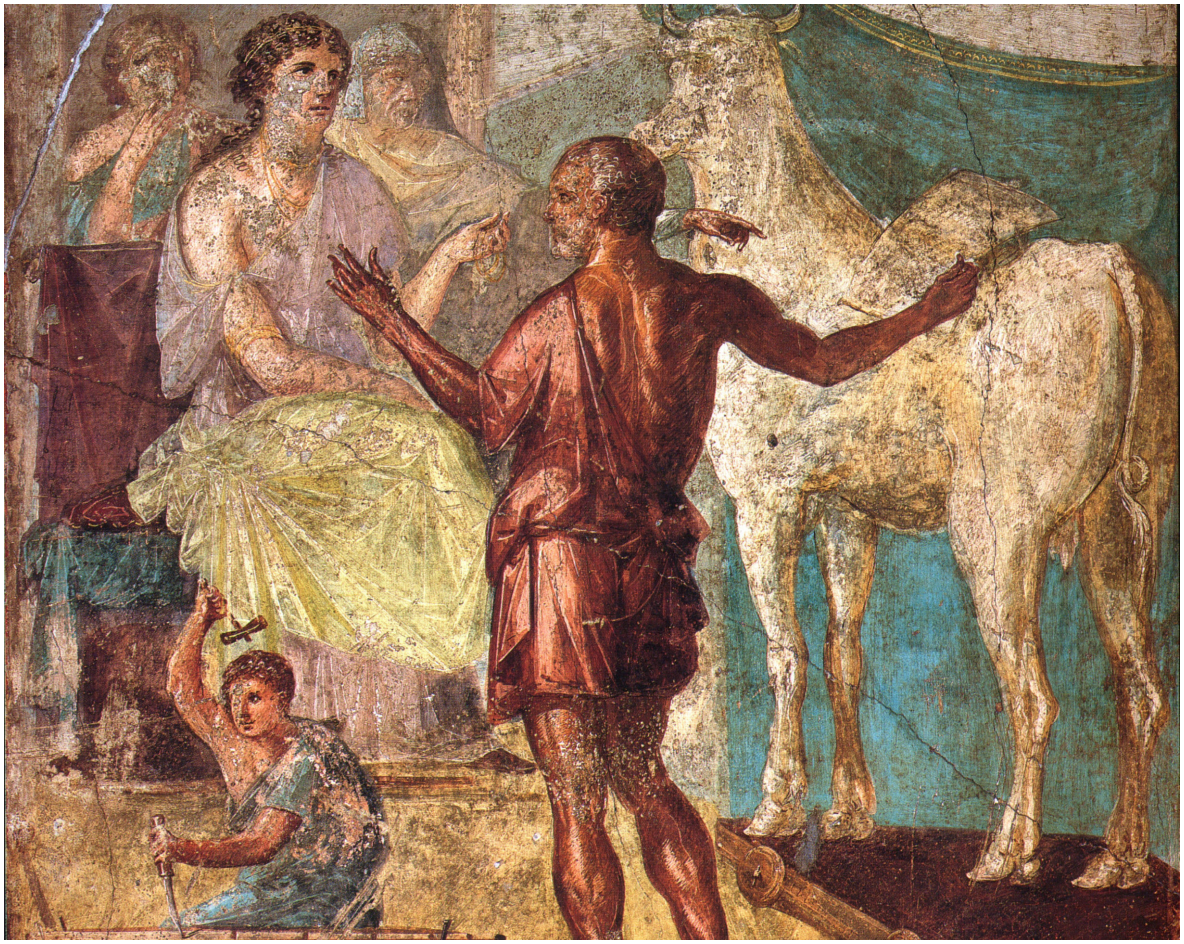
Chapter 1:
vision

1.1 seeing the past

The question of representation is important for architects. Questions regarding the reliability of the craftsmen's products existed as early as the Greco-Roman period when craftsmen were also the architects and master-builders. Philosophers such as Plato, Aristotle, and Socrates, pointed out the potential danger of crafted objects simply being deceiving in nature and not conveying deep meanings (Smith, 2004) (fig 1.1). These philosophers' main interest lay in the pursuit of 'true knowledge', that is the understanding of the workings of the world through looking beyond the visual appearances of objects. As suggested in Socrates' Allegory of the Cave and Plato's Theory of Forms, knowledge lies not in the form of physical objects but in the metaphysical perception beyond the materiality of the object. While Plato suggested that form is a representation of an idea, Socrates demonstrated how a person without proper education could potentially be deceived by the appearance of an image. In his allegory, a group of people chained within a cave can only speculate about the nature of the world by looking at shadows projected on the wall. This concept is comparable to any type of architectural representations that they always possess messages and meanings beyond their materiality and appearances. Yet we often overlook or misjudge these intended meanings as we focused solely on their appearances.

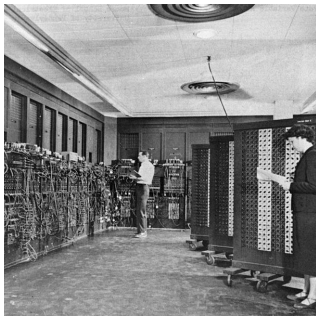
Seeing does not necessary mean knowing. Both Socrates and Plato reinforced the idea that non-material abstractions can only be understood by becoming knowledgeable about a subject. Vitruvius concurred by stating the importance of theory early in his Ten Books on Architecture, in which he assessed theory the same weight as practice (Smith, 2004). An architect's personal theory can result

Figure 1.1 (opposite): Roman fresco found on the walls of Casa dei Vettii, Pompeii. It captures the moment Daedalus presenting the wooden cow to Pasiphae.



from the accumulation of the knowledge gained through study and education, and the collection of experiences through the act of profestional practice. The ancient Greek philosophers may have had a valid position in suggesting the importance of education in combination with craft. However, the education of an architect cannot depend only on thoughts and discussions, because we always have to substantiate these thoughts and consider how to bring architecture forth as drawings, models and crafted objects. Hence, drawings and models are not limited to represent the theoretical abstractions in our minds. They represent both the embodiment of both our bodies and knowledge as well as the understanding of the world as a physical object. The purpose of representations, then, should be a way to understand both our thoughts and our body senses.

1.2 seeing the current world



Electronic personal devices and computers over the past 20 to 30 years have improved significantly. They are substantively innovative and are equipped with more features than previously (fig 1.2). In the last five years, their size has been reduced and minimal cost has made them widely available to everyone (fig 1.3). Technologies have made us see the world differently. Digital Information can be transmitted to any electronic device anywhere, and it will be automatically updated on a second-by-second basis. This has reduced distances between people, places, and information. Communications can be transmitted wirelessly, in real time with only seconds of delay. The variety of information available on the internet has reduced the need to travel physically. However, the availability of technology may not always be beneficial. The way we view our surroundings has changed due to the rush of information passing us every day. There is increasing evidence that some information is being manipulated, and manufactured to suit the needs of potential consumers (Pallasmaa, 2011, 20). As people today are increasingly relying on the visual aspect alone to perceive the world, the tendency to neglect other senses has emerged.

According to Juhani Pallasmaa, our changing perceptions have not only impacted society but could potentially be problematic for architects. From a social perspective, excessive production of imagery often results in “quick but detached and fragmented pieces of knowledge” (Pallasmaa, 2011, 15). This has a devastating effect on how knowledge is acquired. We now receive images from various sources and mass media without the ability to interpret them. We are constantly being flooded by large amount of similar images that they began to stir up a blending effect on existing images. As we are being exposed to these images, we are often led to confusion and misunderstanding during the learning process. Pallasmaa believed this hegemonic effect spawns from mass images, overlapping each other on top of the real world, would lead to a “rise to an experience of a discontinuous and displaced world” (Pallasmaa, 2011, 15).

Figure 1.2 (top): ENIAC (Electronic Numerical Integrator And Computer) was the first electronic computer completed in 1946, occupying 1800 sq-ft of space.

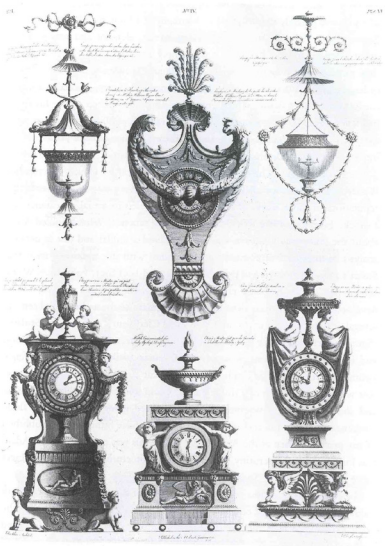
Figure 1.3 (above): The latest generation of laptop computers.

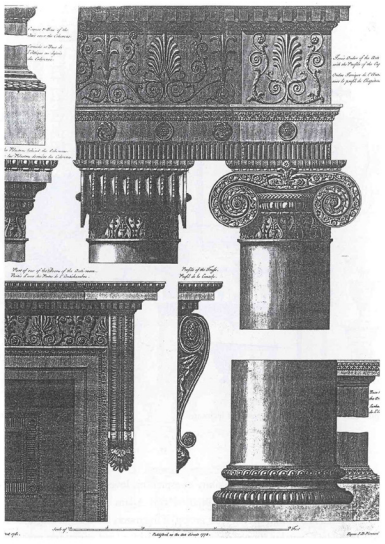
Figure 1.4 & 1.5 (opposite): Robert Adam’s “The Works” in 1773, recording engravings of various ornamental furniture (left) and details of Orders (right).

Furthermore, he suggested that the production of these images by those in authority are, on a personal level, intended to diminish our individual personalities and character, limiting our freedom of choice and turning us against our own imaginations by imposing their vision upon ours (Pallasmaa, 2011, 21). The lines separating fantasy and reality have begun to blur. Architecture has traditionally been a bridge between humans and the divine natural environment (Smith, 2004, 5). Yet today, the trend towards graphical architecture such as themed malls and parks, combined with overpowering images that are designed to enforce a fractional lifestyle, is beginning to undermine the connection between architecture and human imagination, causing a blend between fantasy and reality.

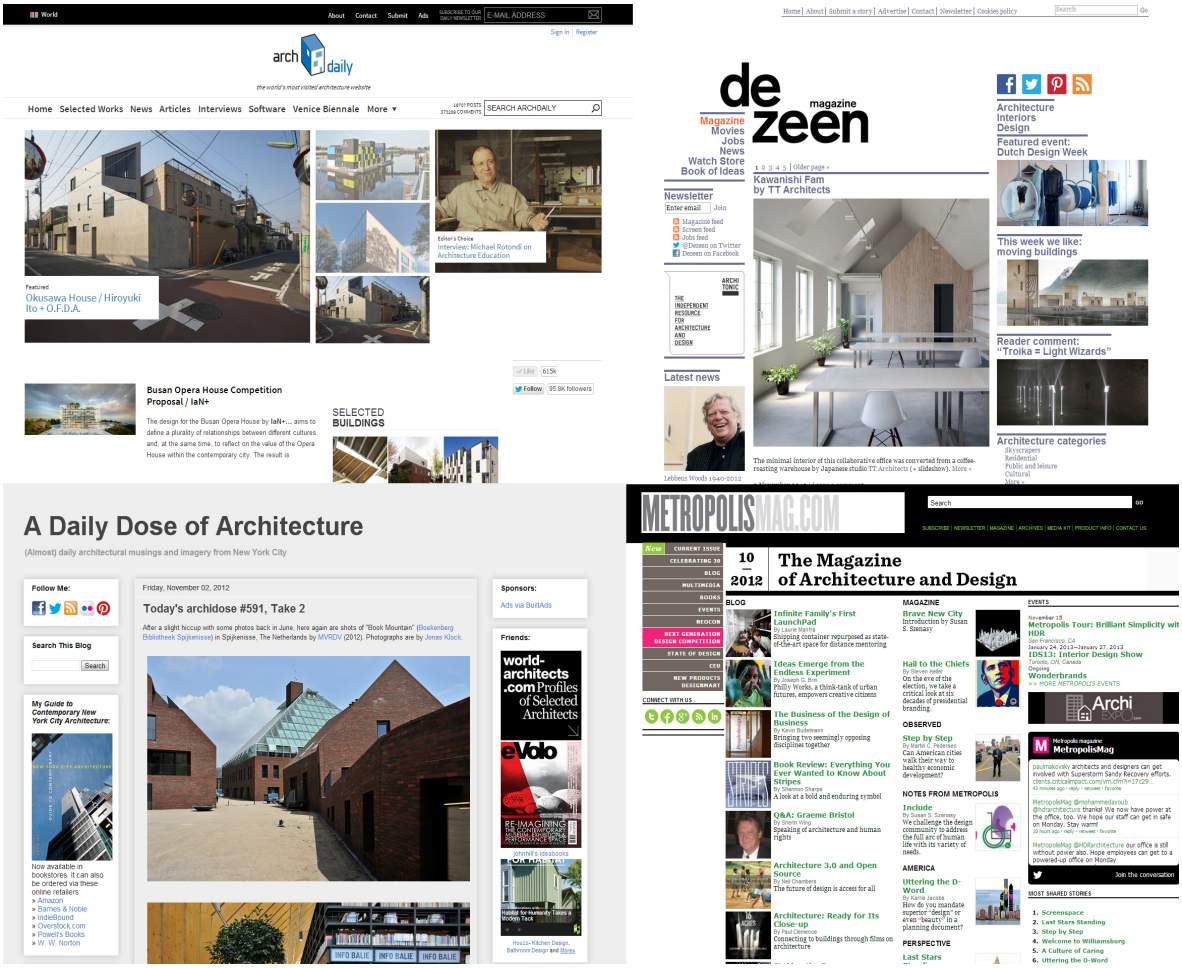
1.3 speed of information

Today, information travels at such an increasing speed that the distance between places and between people has shortened. In the 15th century, architects on a Grand Tour typically traveled from several months to several years. These travels were seen as rites of passage and the proper method to finish one's education (Burzard, 2002, 38).





These architects received firsthand knowledge during their travels which they brought back to their home countries. But this precious information was carried at the same speed as the travelers. The Grand Tour not only set the tradition of educational travel for architects, it also triggered the beginning of style guides cataloging the buildings of antiquity, transforming architecture into fashionable products (fig 1.4 & 1.5). Although architectural books existed before this time, they were usually produced by well known architects for the purpose of educating others (Burzard, 2002, 38). The appearance of style guides catalogued architectural elements into merchandise which were made available to the general public. These books had begun to manipulate the populations thinking not in terms of education but as fashion. By the beginning of the 18th century, industrial revolution had made

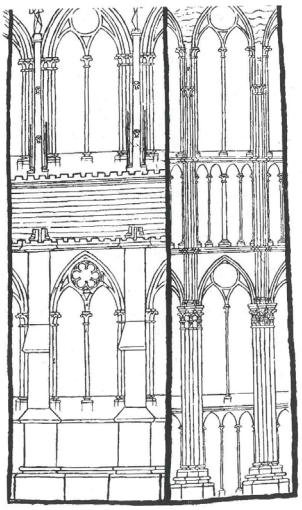


transportation much easier and a lot cheaper. The need to travel is no longer seen as a tradition for the social elites to see and experience; instead, it was transformed into a recreational oriented activity for the general public.

Since then, books have been slowly losing their edge as the primary way to gain knowledge and this has given way to media such as telecommunication, magazines and newspapers, who often provided partial information. Pallasmaa had suggested that “information is replacing knowledge” (Pallasmaa, 2011, 15). He further suggested that “the increasing speed and short attention span, and the consequent simplification of both text and image, the accelerated communication inevitably reduces nuances and flattens the space of individual imagination” (Pallasmaa, 2011, 16). The diminishing effect on traditional books exelerated under the influence of the internet and other mass media. Through these new channels, information became much easier to produce and quicker to transfer. By the time we receive the information it would have been reiterated and reproduced many times (Pallasmaa, 2011, 20). This communication process creates un-necessary layers of single information, and fragments them during each reiteration. This adds to the confusion and chaotic environment we now reside within. The way we receive information has changed under these circumstances. Unfortunately, we had grown accustom to the quickness of mass produced information and inevitably translated into architectural representations being understood as fragmented pieces detached from the architectural idea (Pallasmaa, 2011, 23). A single architectural story can now be available on various websites and magazines at a given time, each containing slightly different perspectives and digitally produced images (fig 1.6).

Figure 1.6 (opposite): Compilation of various popular architectural web sites.

1.4 seeing architectural models



Architectural models are known to have been used for years. They have always been a form of communication. Craftsmen of the ancient world used full scale models to test and document ideas. Full sized mock ups in wood, or in stone were produced because they believed that drawings and small scaled models were inaccurate (Porter, 1995, 8) (fig 1.7). Hence, built buildings were used as architectural standards and examples for their contemporaries at the time. During the Renaissance, scaled models were used with perspectives to demonstrate compositions of elements or to showcase ideas to clients. Some of the models had their scales much reduced but still remain large compared to present day models. Following the Art Nouveau period, art began to be made in experimental methods where artists tested alternative expressions with different media, which influenced architects in attempting new methods in model making as well as new uses of models. Architects began to use models as a mean to

demonstrate ideas and concepts, such as Tatlin's Monument for the Third International was used to propagate the communist party (fig 1.8). Others used models as a tool for generatingforms, such as Antoni Gaudi's inverted hanging chains (fig 1.9). Since then, architectural models have come in all sizes and forms, expressing both literal and abstract ideas. Architects have began to develop a particular relationship with their models and their use has been integrated in many architects' design processes, such as Frank Ghery, Daniel Libeskind, Renzo Piano, and Norman Foster. Models can now be used to generate form, such as Ghery (fig 1.10); to test and simulate performance, such as Piano and Foster (fig 1.11); and express design philosophy, such as Libeskind (fig 1.12).

Figure 1.7 (opposite top): Medieval drawing attempts, elevations of the towers of Laon Cathedral, 1335

Figure 1.8 (opposite): A 1:40 scaled reconstruction of Tatlin's Monument for the Third International in the courtyard of the Royal Academy of Arts, London

Figure 1.9 (above): Antoni Gaudi's famous hanging chain model.

Each architect sees models differently. Peter Eisenman saw the model to represent "an idea in itself and an idea about objects"; while Stanley Tigerman would suggest the model was "an idea about ideas rather than an idea about architecture" (Moon, 2005, 20). According to Karen Moon, models are not deliberately made to represent a building. Instead, the model represents the idea of architecture. She described

the model to be “an idea but also an object. It is about the project, but it is also about itself” (Moon, 2005, 18). The modern model allows for mulitple interpretation from different viewers, the model itself can represent both its phsyical properties and the idea it may carry. This inevitably creates a distance between the actual intended ideal of the architect and their models. Whether the model remains as the imagined images or becomes the built construct, the “ambiguous position” of the model is both dangerous and rewarding (Moon, 2005, 18). On one side, there exists an physical relationship between the model and people as an object that we can move around it everyday life and easily understand it with our eyes. At the same time, the model being a representation of an idea would, as described by Michael Graves, “begin to have a life of its own, somewhat separated from or beyond our original conception” (Moon, 2005, 18). This ‘ambiguous position’ of the model allows the interpretation of the model to be diversified, increasing possible leads to permutations and opportunities to develop variants. Throughout the process, the architect must constantly verify and analyze all possible leads generated from various iterations.

The initial development of CAD and computer hardware has allowed the computer to be integrated into the architectural practice; it has been widely praised for its accuracy and efficiency. This shifted architectural practice from using traditional paper drawings with physical modeling to paperless virtual documentation and simulation. Various software originated from other industries such as film and animation are

appearing in architectural studios. Architects have changed the way computers are used in architecture. The initial intension of the computer was to calculate complex geometry and freeform shapes that we are unable to comprehend on paper (Kalay, 2004, 77). The computer is able to perform far more calculations per minute than we are capable of in a year. As more specialized software and hardware were developed, the function of the computer advanced from being simply a calculator to a tool to assists us to perform our tasks efficiently and accurately. It is only the rapid computer development transforming it into a design enironment that has become problematic (Kalay, 2004, 78).

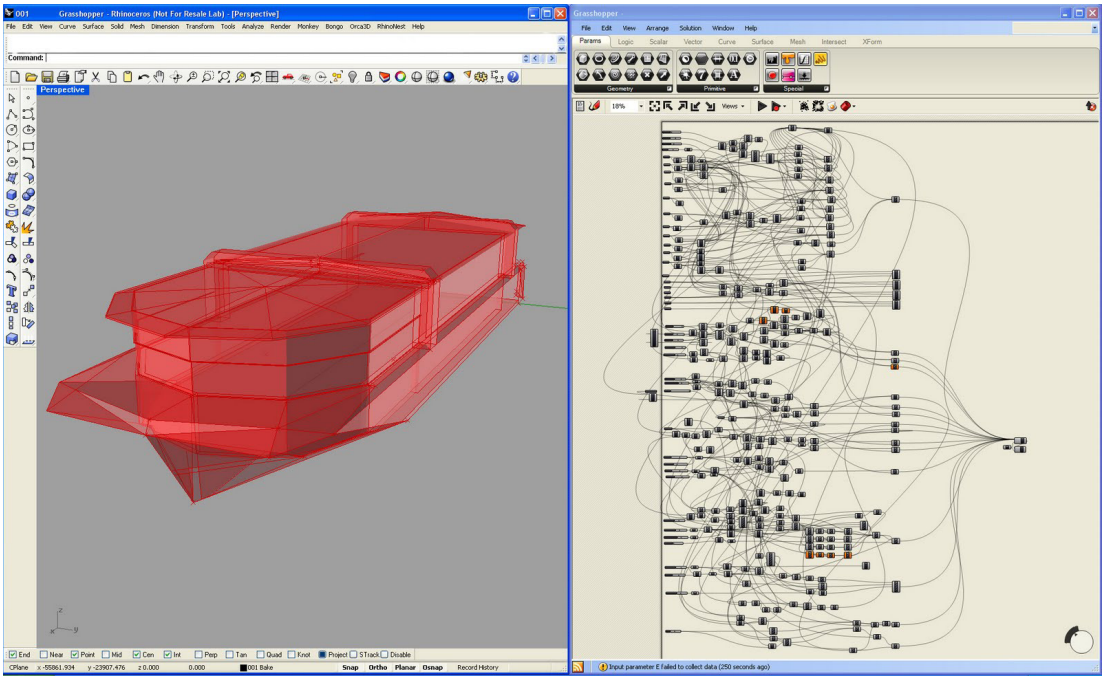
Operating this advanced software has always been difficult and requires extensive practice. Kaley explained that “designers must fiddle with all sorts of knobs, switches and gadgets to set the machine up so it can begin to support the design activity” (Kaley, 2004, 79) (fig 1.12). Software compatibility poses another problem, not any single software is capable of performing every task. It would be typical, especially for architectural students, to have acquired the skills of three to four programs at a time. Instead of developing and understanding their imaginative skills, the computer forced architects

Figure 1.10 (opposite): Foster and Partners building the model of the Reichstag in 1:20 scale on top of the roof of the Reichstag, Berlin, 1996.

Figure 1.11 (above): Daniel Libeskind’s disassembled model for the Potsdamer Platz project, 1991.

to focus continuously in the learning process of computer program as each eariler program became obsolete. Architects eventually become occupied in the operation of the software they use that the actual task of design seems to have been handed over to the computer.

When computers have become central to the design, they engulf the imagination of the designers by forcing them to follow its lead (Kaley, 2004). This is because models generated in a digital environment have very different restrictions compared to traditional physical models. As mentioned in the previous paragraph, computer models are restricted by the functioning of the programs, which are not beneficial for imaginative design as they draw the designer's focus on creativity away. On the other hand, physical models are restricted by constraints of a very different nature. They are bound by physical constraints such as material, gravity and time, which is absent from computer models as the object on the screen, either seems to be flowing, or there is no way to sense the material being applied. As suggested by Stan Allen, architecture is losing its material specificity (Allen, 2009, 73). In such scenarios, designers must therefore constantly be aware of making the image compelling; this distraction would only limit imagination and



creativity. It actually requires great confidence in one's judgments and knowledge to use the computer credibly. For example, the computer can instantly replace with column a cable, but there is no way to tell whether it is structurally possible or not. This change is only visual and the architect will need to find out if the computer is capable of simulating this scenario. The computer can only be operated under the assumption that architects are knowledgeable enough to justify their own decisions. On the other hand, the effect of the same change from a column to a cable is imminent in a physical model since the model itself if already bounded by restrictions. Although the physical model seems restrictive, it actually reveals to architects the opportunity to venture beyond their own knowledge, allowing experiments, and questioning existing rules.

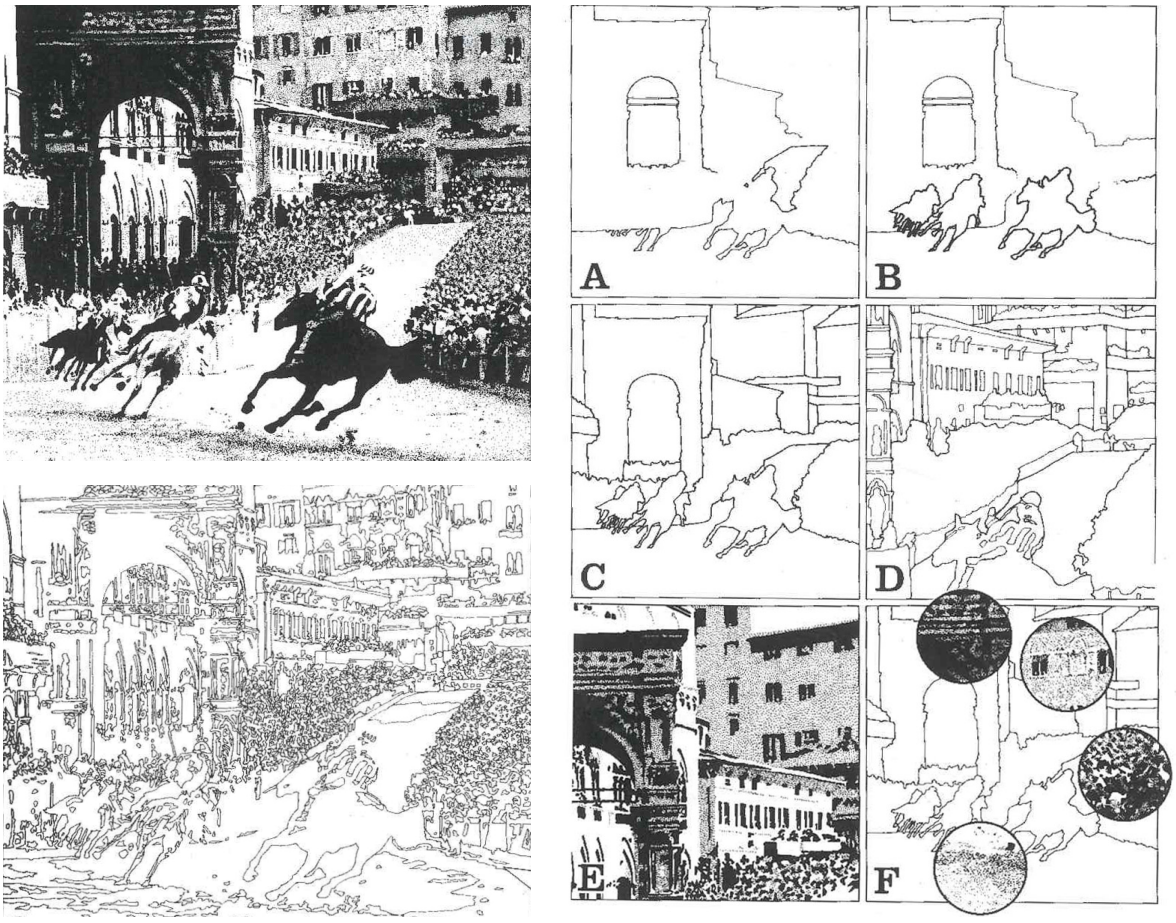
It is not to say that digital computing should be excluded in architectural design. Instead, this thesis aims to reveal the fact that other senses are equally important in composing architecture. It would be difficult to prescribe the proper way of using digital computing in architecture, simply due to our individual subjectivity. Albert Smith used the Greek myth of Daedalus, who flew away from the island that imprisoned him using wax wings, as a metaphor for the balance necessary when using technologies in architecture (Smith, 2004) (fig 1.13). Computer models, for example, can simulate real world situations, which is excellent for testing structures. In some instances, the computer becomes the modern 'Deus ex Machina', or 'god from the machine', which refers to a divine intervention upon an unsolvable issue that is beyond the humans' capacity to comprehend (Smith, 2004, 19). The computer can sometimes provide unexpected 'suggestions' and 'hints' through the very images created by us. As we look upon these images we are stimulated and inspired to novel ideas. This enhancement to our thinking process was described by Macro Frascari as "the sensory images of a building we have seen and the flavors of food we have tasted can be transmuted in new buildings and novel dishes" (Frascari, 2011, 6). Intimately constructed models can metaphorically speaking, work out like the 'Deus ex Machina'. We as architects have to recognize the proper use of computer as documentation and analysis tools.

Figure 1.12 (opposite): An example of a ship modelled with Rhino, Grasshopper.

Figure 1.13 (above): A relief sculpture of Daedalus and his son Icarus in Villa Albani, Rome.

1.5 seeing space

Seeing is actually a process of reconstructing the scene. The eye does not see a complete image. Instead it can only focus at one point at a time like a camera capturing key and significant moments of the picture. This process breaks down the image into manageable layers of information, like an “analytical striptease” (Porter, 1997, 49) (fig 1.14). The brain then connects these key elements using our cognitive power, our imagination, and the ability to associate similar patterns. Seeing space is a way to analyze through image building. Throughout this process, we constantly compare masses and voids, lines and geometry, shapes and sizes, tone and color, light and texture. Spatial



experience, on the other hand, differs from seeing space in that an impression is created by our sensory mechanics as we move through space. This experience is felt through contrasting different spaces and as we move through them at different times of the day.

Understanding space involves the body physically moving through it. Tom Porter described in his book this process of understanding as “primarily a sensual event involving movement – for to pass through an environment is to cause a kaleidoscope of transitions between one spatial impression and another” (Porter, 1997, 26). Spatial cognition cannot rely solely on perception alone; it involves other senses and requires the entire body. Porter furthers his argument by suggesting that “there is probably little conscious awareness on our part of the sensation of handling this book, the chair on which you now sit, or the support on which your elbows rest. As designers, our articulation of space could be far richer if we become only slightly more aware of the tactile sense” (Porter, 1997, 29). To demonstrate the capacity of spatial depiction through the body, Porter described a museum in Shibuya, Tokyo. Gallery Tom is a touch-me museum dedicated to the blinded and visually impaired by allowing hands-on experience with arts (fig 1.15 & 1.16 & 1.17). The project architect, Hiroshi Naito, enhances

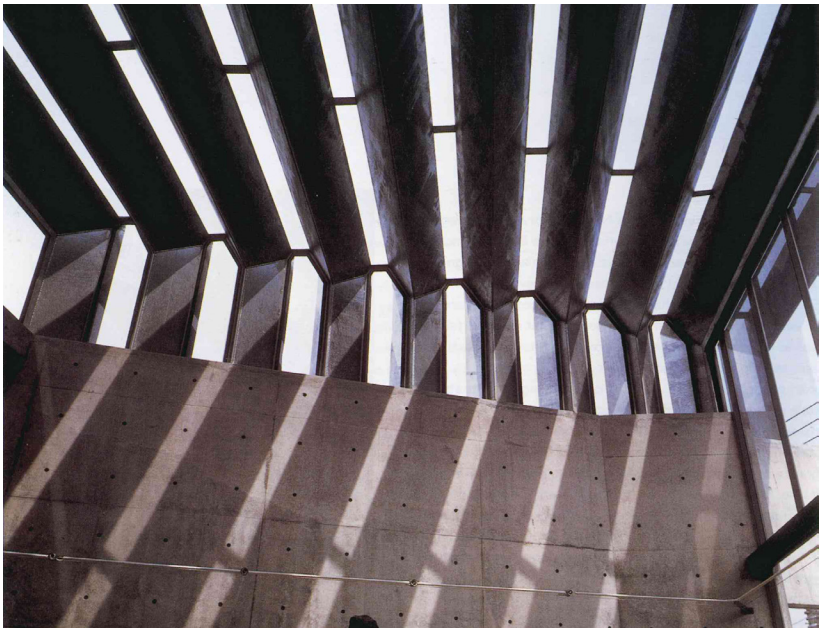


Figure 1.14 (opposite): Tom Porter’s example of an ‘analytical striptease’. The image is broken down to lines, geometries, points, foreground, mid ground, and background.

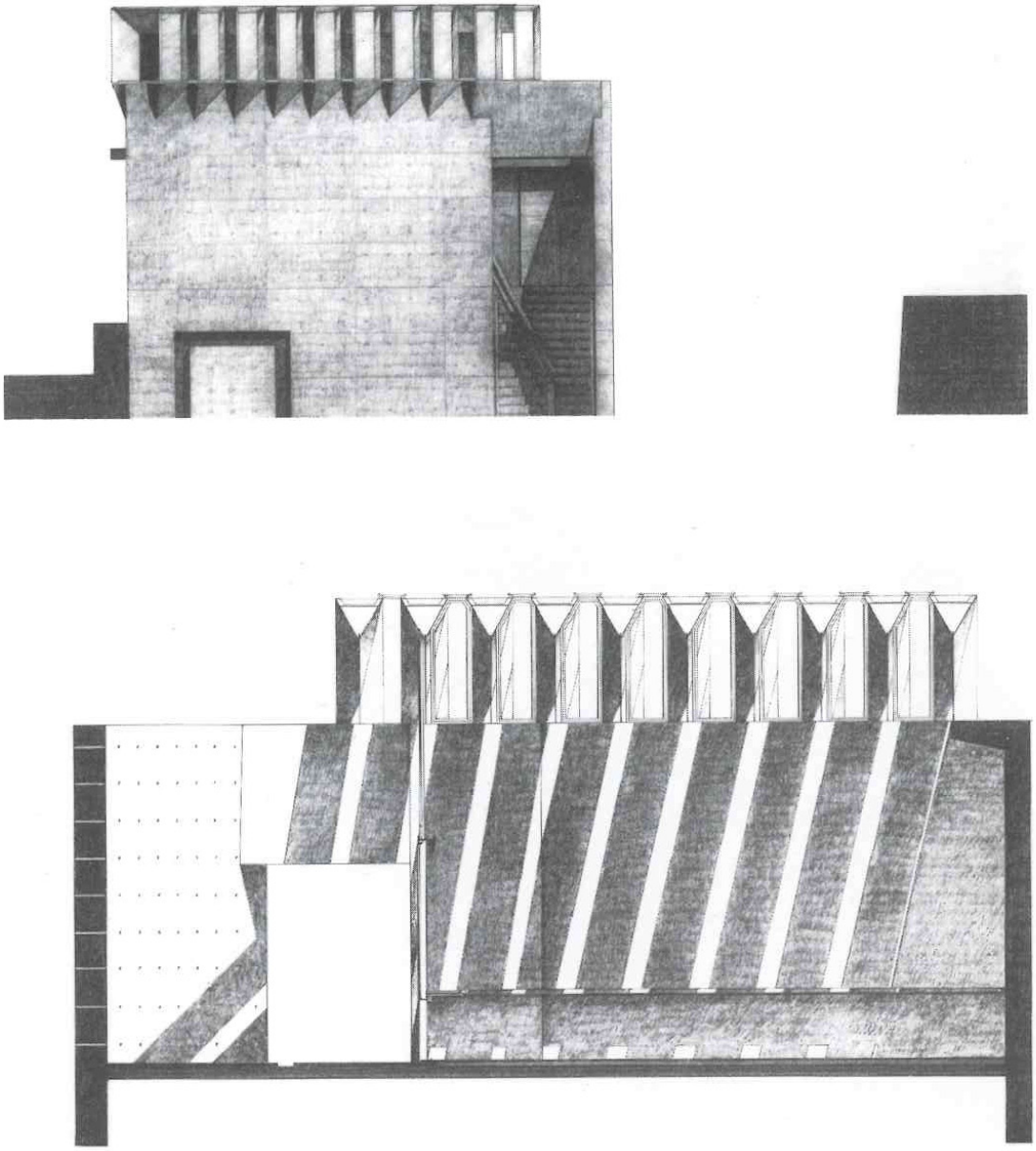
Figure 1.15 (right): Roof of Tom Gallery.

bodily sensations through the use of various materials to indicate different spatial volumes and their qualities. The first floor provides a performance and gallery space. The use of soft tatami mats provide a cushioned and warm sensation suggesting an intimate seating space, while hard wood flooring indicated areas of traffic as the echo allowed the movements of the performers to be tracked (Porter, 1997, 35). The first floor is topped with two more levels of gallery spaces and a roof with strips of diagonal skylights. The alternating lights through these skylights gave a sense of distance as the body moves through the space (fig 1.18). The gallery attempts to suggest that when a sense was isolated or blocked, other sensory receptors would become more sensitive, capable of replacing the missing sense.

It is understandable that visual perception stands as the primary receptor as it provides more information than other senses, but our physical surroundings require far more knowledge than what the eye can provide. Architecture was traditionally oriented towards being visually pleasing. However, in the setting of the Gallery Tom, there was no need for this effect. As Porter quoted Naito, “the eye of the blind are always attuned to the world we cannot see: ‘They experience the building by the number of steps, by feeling the light on their skin, they touch the volume of space by sound.’” (Porter, 1997, 38)

Figure 1.16 & 1.17 (left): Exterior of Tom Gallery (top); interior of Tom Gallery (bottom).

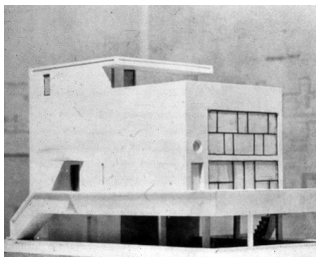
Figure 1.18 (opposite): Sections of Tom Gallery by architect Hiroshi Naito.



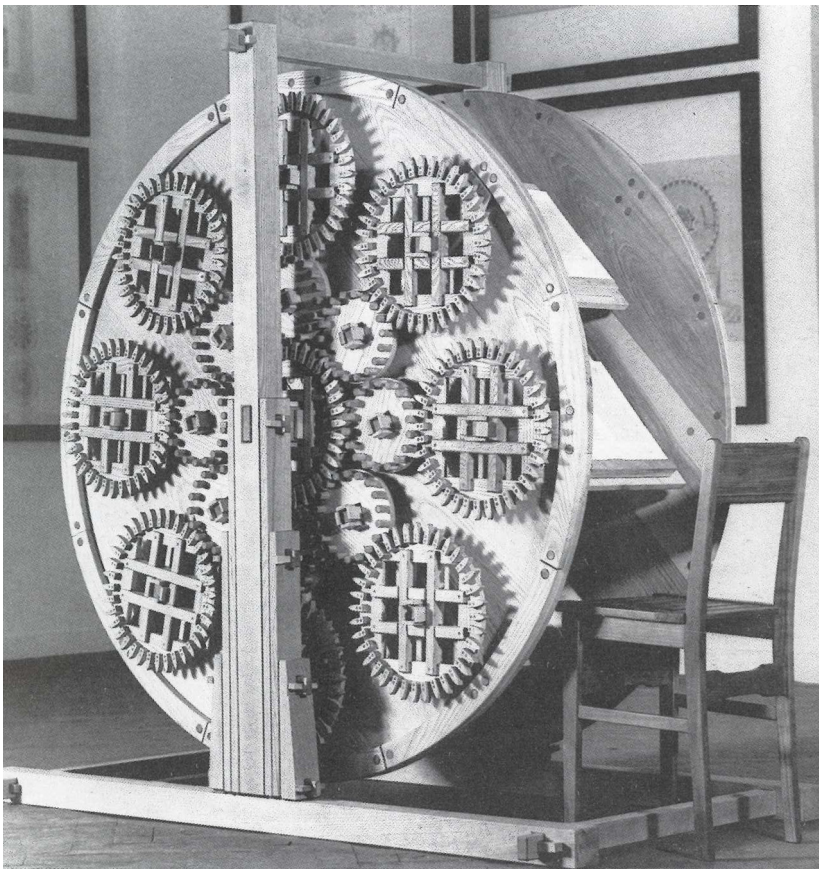
Thesis Statement

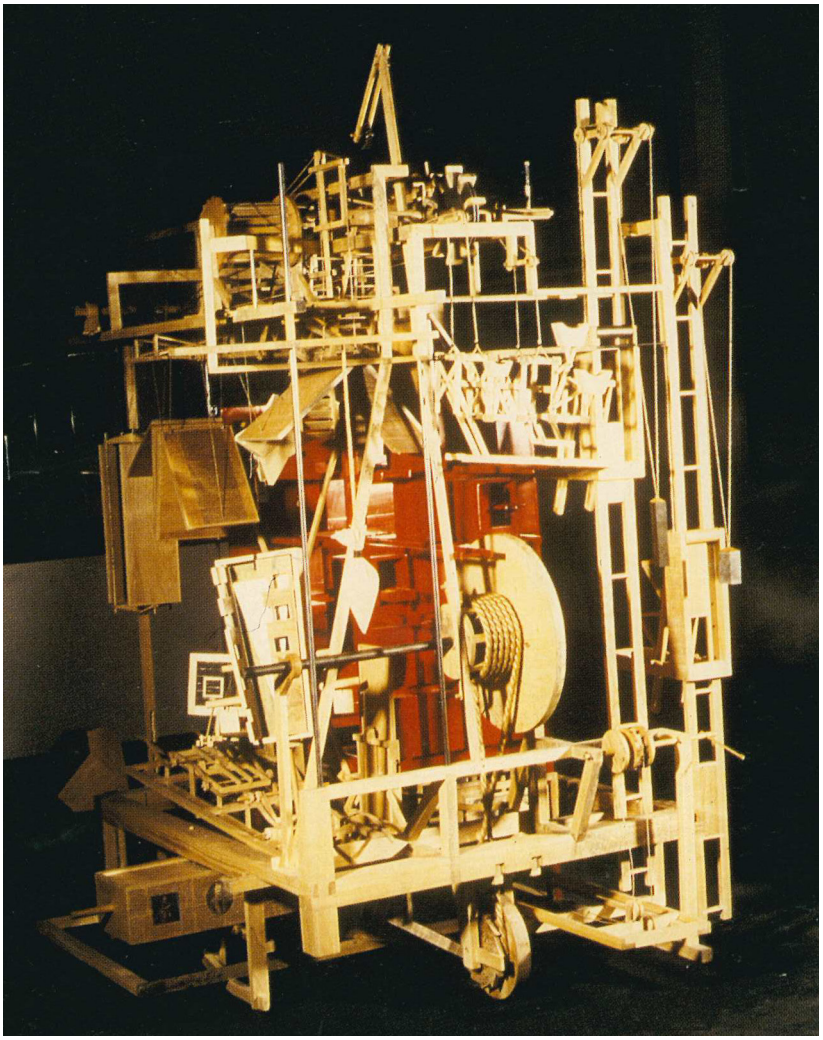
The making of physical models is an act of ‘true play’ (free play), bounded only by rules set by the designer. Whereas the computer model is like playing games (adhere to rules), bounded by rules setup by someone else. The architectural design process would be more beneficial when ideas are being developed using physical models, especially when the architectural process is an act of understanding the self and the surrounding environment through establishing the body as an extension of the mind and architectural models as extensions of the body.

1.6 An essay on the machine



The timeline for the modern machine, compared to the long history of human development, is as seen insignificant. Modern machines, and particularly the computer, saw tremendous development only in the recent 200 years. In the beginning of the 20th century, Henry Ford's Model T did not have a computer onboard. Today, a common family car can have 30 or more computers monitoring every movement and controlling every device. Yet without the machine, or any of the simple machines such as tools, our technologies would not be able to arrive to the height they are today. The machine has been evolving along with human culture and has become an inseparable part of human evolution.





A machine, as defined in the Oxford English Dictionary, is a combination of multiple parts each with a specific function and together they perform a definite task. The task would be to produce an object, an effect, or perform a function. There is an intrinsic relationship between machines and architecture. The ancient Roman architect Vitruvius devoted his last chapter of the 'Ten Books on Architecture' to machines, in which he used the allegory of creating machines to stress the importance of scale with precise measurement and the understanding of craft in the making of architecture (Morgan, 1914). Others have also associated the machine with architecture. Le Corbusier suggested that the house is a machine for living (fig 1.19). In which he suggested the spirit of

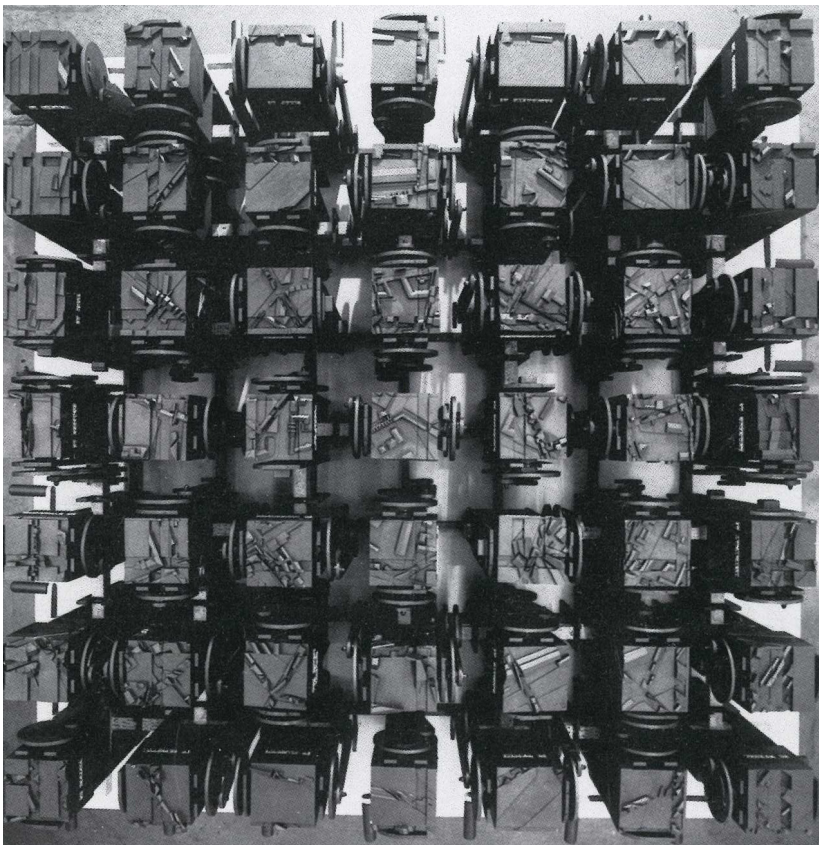
Figure 1.19 (opposite top): Model of Maison Citrohan, 1920. Le Corbusier's parallel on architecture adopting mass production of automobile industry.

Figure 1.20 (opposite): Daniel Libeskind's 'Reading Machine' for reading the past, 1985.

Figure 1.21 (above): Daniel Libeskind's 'Memory Machine' for reinterpreting the present, 1985.

living lies within functionality of program and efficient body movement relies on rational thinking for the space (Smith, 2011, 773). Daniel Libeskind metaphorically compared his vision for architecture as a series of machines. His three machines, built for and exhibited at the 1985 Venice Architecture Biennale (fig 1.20 & 1.21 & 1.22), revisited the fundamental bases of architecture as a process. His process suggested architecture is a cycle of reinterpretation of the history of architecture itself from which reiterations of the past and the freedom of play at present project themselves onto the future of architecture (Libeskind, 1988). These exercises demonstrated that built artifacts are measuring machines that double as directional devices to help us imagine.

According to Albert C. Smith, architecture, both built buildings and physical models, can be seen as machines to measure. He described; “architectural models serve as measuring mechanisms extending the



architect's intellectual might in an attempt to understand a complex and confusing world" (Smith, 2004, xvi). Measuring devices are referencing equipment which themselves represents the known facts and the unknown is directly compared to. Architecture is often a vision imposed by the architect, a projection of imagination of the architect's utopia and a result of their creative faculty. The physicality of the architecture is the architect's imagination at the present. When we see architecture, we compare it to our ideals. The built architecture or physical models then serve as measuring devices. They measure the validity of the architect's vision and then stimulate our reactions as we contemplate them. Beyond its function as a measuring

Figure 1.22 (opposite): Daniel Libeskind's 'Writing Machine' for projecting the future, 1985.

Figure 1.23 (right): 'Truth Machine'.

machine for both demonstration and documentation, architecture also operates as pointers. As Smith (2004) has suggested, “[architecture] helps define our position not only through its physical existence, but through the stimulation of imaginations as we compare them against their surrounding environment” (xvii). This idea is further reinforced by Nader El-Bizri stating that “they [architecture] furthermore offer pointers and directives to events that carry manifold possibilities of realization” (El-Bizri, 2007, 35). Embedded in what we have created, there are more architectural ideas that are often not clear, blurry and sometimes invisible even to the architect. The machine communicates

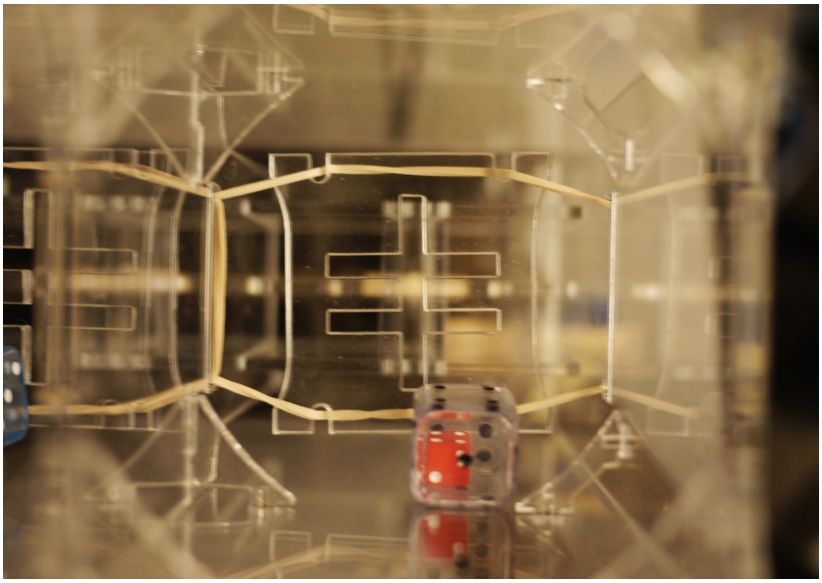


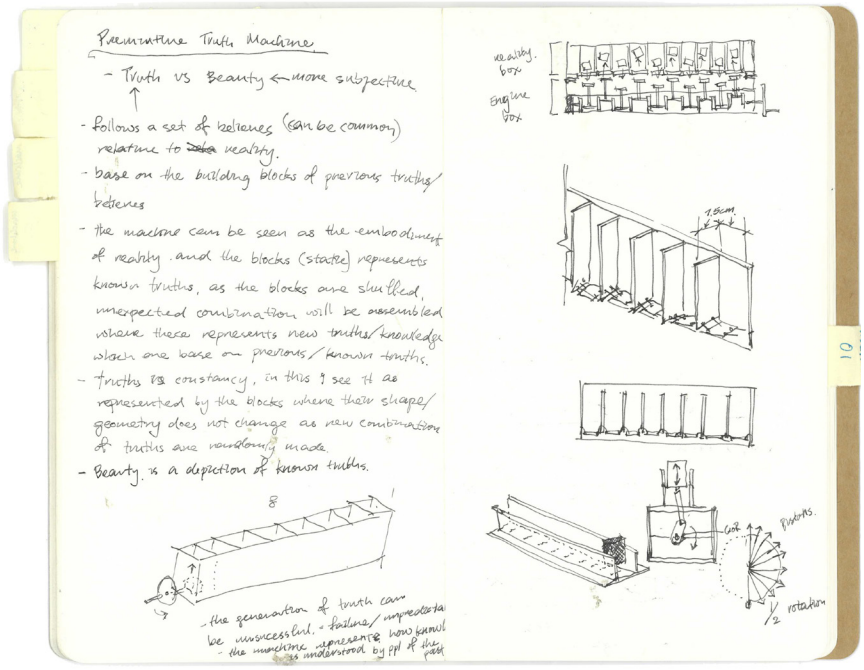
Figure 1.24 (above): ‘Truth Machine’, elevation view.

Figure 1.25 (left): Close up of one of the bays, where the dice sits and bounces.

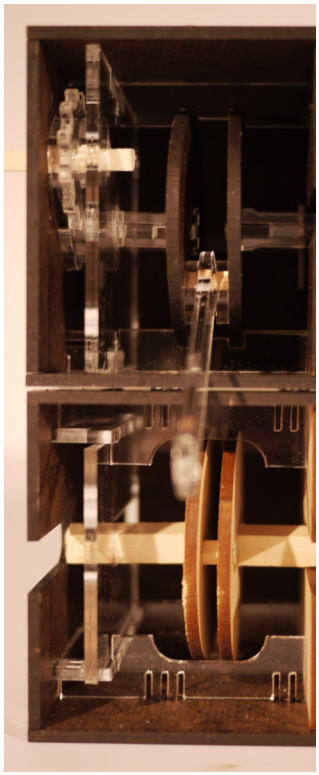
Figure 1.26 (opposite): Initial sketches of the ‘Truth Machine’.

the architect's ideas through metaphors, allegories, symbols, and other representational images that stimulate our imagination towards its intended messages. Most importantly, the presence of the architecture, being an image in our mind, directs our perception towards the invisible, allowing us to contemplate one's own utopian visions while speculating upon other visions.

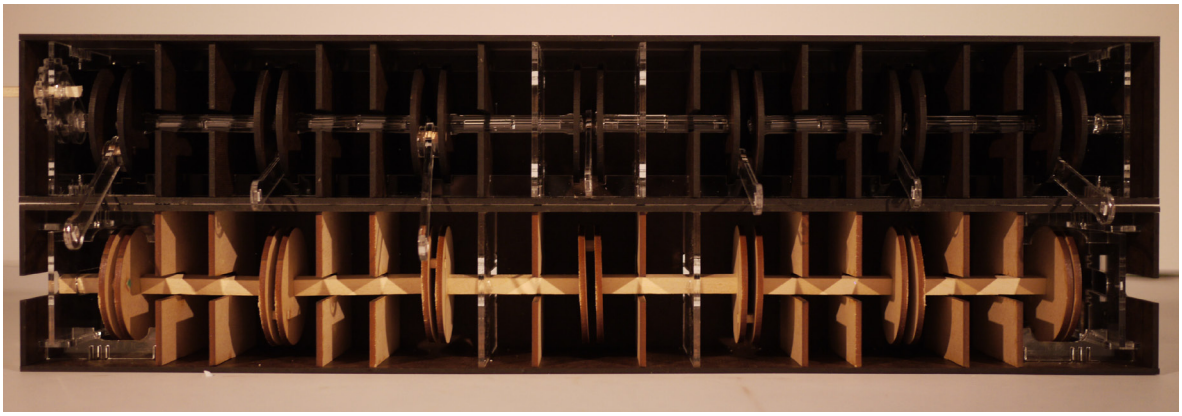
It is with an understanding of this premise that I conducted an exploration exercise with two intentions. First, it was a practical response, to experiment with the concept that architecture can be seen as measuring devices. Second, it was to define a personal vision of the expression of the aesthetic in architecture. The dictionary definition of aesthetics suggests that it represents principles concerning nature and beauty (Stevenson, 2010). Furthermore, the principles of nature often govern a general concept of true and false as we subjectively perceive our surrounding environment. Hence, 'truth' has in turn formed the bases of our individual knowledge. As a result, the 'truth machine' is essentially an attempt to demonstrate the basis of individual subjective interpretation.

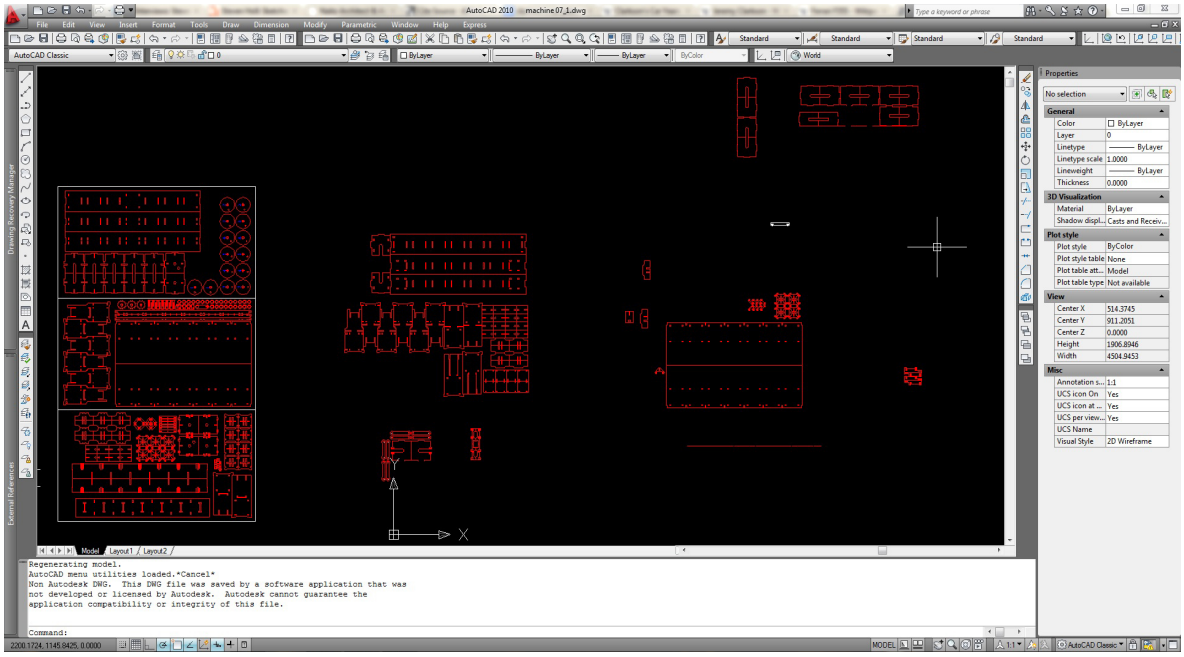


object of metaphor



Architectural models have always existed as a means to communicate, either through symbolism, metaphor or allegory. They either demonstrate the architect's intention, or to showcase an effect that the architect desires. The 'truth machine' was constructed as a combination of allegories to demonstrate the idea of truth, in general, through the lens of architecture. The machine comprised of two major components. A clear and transparent section is placed on top of an opaque block. The lower block is a parallel to the way we perceive the invisible forces of nature and to the conditions that we see yet do not understand. The upper section represents the world we understand. The intention was to reference the world as we live in it and the way we see the world. The dice in the upper section represent the basic elements of our knowledge, an archetype from which new information and changes originate. The die bounce as the machine is being driven by a spectator. They generate combinations of random numbers as they bounce. This randomization of the dice demonstrates how little control we have over the things we understand. New knowledge is often encountered through accidents or as a result of trial and error. Beyond its intention as a demonstrative device, the machine inevitably also operated as a 'pointing' device on a subconscious level. It created the dangerous vision of spectacle craftsmanship through the use of computer and digital fabricating machines.





computer in the design process

The design process of the ‘truth’ machine was conducted prior to formulating this essay. Besides a few initial sketches, digital software and computerized fabrication tools were used extensively throughout (fig 1.25). This led to an effect that will be discussed in this thesis, one which Pallasmaa called “the demise of imagination”. The design process of the machine had fallen into a ‘design environment’ scenario. The design of the machine was a process that involved translating physical measurements into numbers which are inputted into the computer. An assumption was made that whatever appears on the screen would equate that in the real world. Stan Allen described this scenario as “a tunnel-like camera vision, ignoring the fluidity of the eye and the intricacies of peripheral vision” (Beckmann, 1998, 246). A sub-conscious mind set withheld any desire to question the realism of the image. The use of computer helped the production of visualized images and accurate drawings that were necessary for the production of the machine. However, due to this accuracy in the visualization produced, there is no space for imagination and for the machine to

Figure 1.27 (opposite top): detail of the turning mechanism.

Figure 1.28 (opposite): Internal mechanisms of the ‘Truth Machine’, top is a newer version with parts more in acrylic; bottom is the older version with parts in MDF.

Figure 1.29 (above): AutoCAD screen showing parts to be laser cut.

evolve on its own. Allen believed the accurate design environment negatively impacted the image production to “ignore what has traditionally given architectural representation its particular power of conceptualization-that is to say, its necessary degree of abstraction, the distance interposed between the thing and its representation” (Beckmann, 1998, 246). The final form of the design was set the moment a line was drawn in the virtual world. The use of the computer eliminated the chance for the design to be contemplated, as it focused the attention of the process of detail fine-tuning, which turned out to become an exercise in perfecting the movement of the machine, resulting in an image of seemingly spectacular craftsmanship.

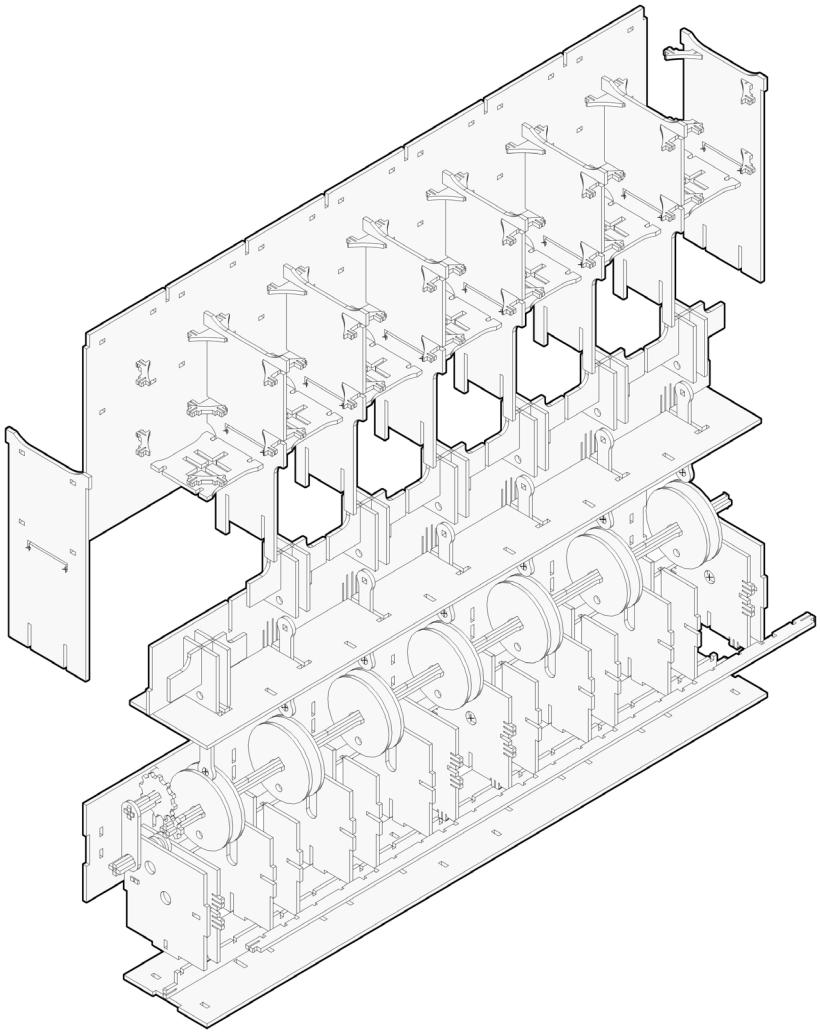
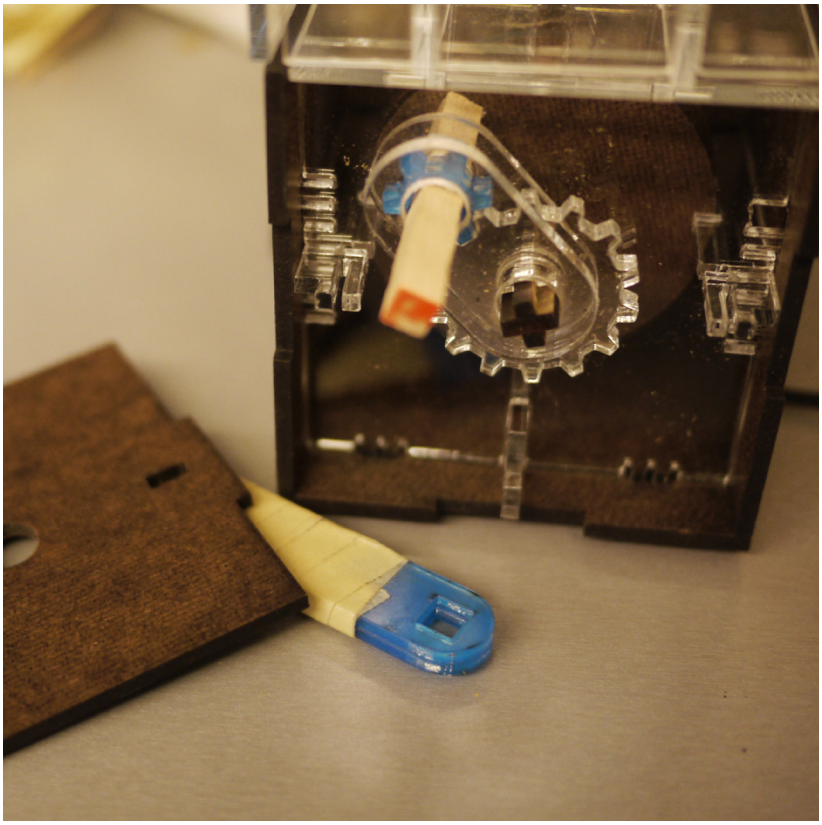


Figure 1.30 (left): ‘Truth Machine’, exploded axonometric.

Figure 1.31 (opposite): Detail of the turning mechanism.

a machine of process

The resulting ‘well-crafted’ image obscured my attention towards the real meaning of the machine. While the machine can, on one hand, provide us the opportunity to reflect upon our understanding towards our own bodies and guide us to better cohere with the world. It can also obscure our sense of the real life with visually pleasing accuracy. If architecture is to be seen only as the latter machine that obscures our sense of real life, it could potentially become overpowering and influence how we conceive its hidden messages. And like any other tools, there exists a possibility for the architectural machine to lose control. Yet unlike other machines where their accidents may lead to fatality, the danger of the architectural machine would lead to false imagery. There must be a balance of control over the operation of the machine.



Chapter 2:
experience

2.1 experiencing as being

German philosopher Martin Heidegger's work on phenomenology had influenced many architects and critics such as Peter Zumthor, Steven Holl, and Juhani Pallasmaa. His work suggested how the world should be understood from the perspective of phenomenon and showed particular concern over the quality of human experience. It laid the foundation for hermeneutics, deconstruction, and other theoretical views on architecture. This thesis concentrates primarily on his writings that are most related to architecture, particularly 'The Thing' based on a lecture presented in 1950.

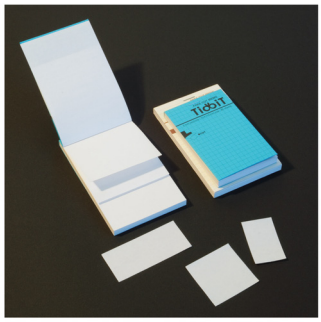
Heidegger's work showed his concern for the quality of human experience; how the intensity of things could affect us emotionally; or how our thinking involves a non-systematic and non-linear process. This is important to the architect as it effects the decisions we make during the design process. According to Adam Sharr, who wrote about

Figure 2.1 (left): The potter is very near to the potteries they make.

Figure 2.2 (opposite top): '365 Charming Everyday Things' exhibition by DGT Architects, exhibiting in a old factory in Paris, 2011-2012.

Figure 2.3 & 2.4 (opposite): Objects on the day of August 29 and September 29 of 2012 from the '365 Charming Everyday Things' exhibition by DGT Architects.

Heidegger, Heidegger's writing reveals to the architect how "people make sense first through their inhabitation of their surroundings, and their emotional responses to them"(Sharr, 2007, 2). 'The Thing', from Heidegger's perspective, investigated philosophically on the 'thing', which he referred to as the everyday's things surrounding us. This is important for the architect; to us, the 'thing' could be seen as any task, our drawings, our models, and our computers. This understanding of the thing through experience would allow us to become closer to the work we do everyday. Heidegger's interest toward the 'thing' was a respond to the diminishing distance due to international travels and



Wednesday
水曜日
赤口 SHAKKOU
29
AUGUST
2012
平成二十四年
8月
葉月

Saturday
土曜日
先負 SENBU
29
SEPTEMBER
2012
平成二十四年
9月
長月

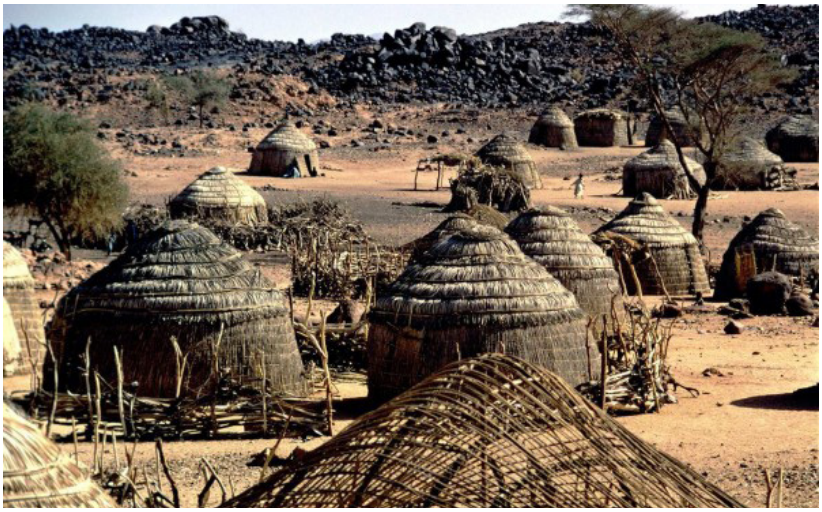
mass media that occurred after World War II (Sharr, 2007, 24). He saw this distance to have a negative impact on the way we experience our surrounding environment because we will cease to appreciate the existence of things around us. For Heidegger established that we as individual thinkers exist; an idea that is fundamental to philosophers. For the intention of this thesis, his work is crucial in setting the foundation for the architect to acknowledge the fact that we too exist as individual thinkers in a sensible physical world. Upon answering the general philosophical question on 'being', Heidegger further distinguished his theory from others by suggesting that we receive the world as we situate ourselves within it. He believed that the world was already here in existence before we noticed it and understood it. This view was different from the prevailing western tradition that we observe the world from an intellectual detachment. Heidegger suggested the idea of proximity from us as beings to the everyday things around us, which he coined the term 'nearness' (Sharr, 2007, 24). This allowed us to become closer to things we are trying to understand. It helps us to develop a relationship that could be physically distanced yet emotionally closed depending on the intensity of nearness we have to it. Our understanding of 'the thing' helps us to become familiarized with 'the thing', triggering our emotions and memories towards it.

Heidegger saw the 'object' as a product of science and technology that exists only as a measurement of the physicality of the subject and it is "too abstracted, too pretentious, and too detached from the daily experience" (Sharr, 2007, 30). The 'object' are to be seen as To Sharr, Heidegger's distinct relationship between the thing and the object was his attempt at validating "the authority of the immediate human experience over abstracted philosophical truths" (Sharr, 2007, 26). It was important for Heidegger to highlight the intellectual detachment caused by the act of observation in order to intensify the necessity for experience. He believed that his act of observation elevated individuals to a higher plane, distancing them from the daily existence of things, where these objects became "pure ideas, each an original model or archetype, [that] are addressed by the mind. [While] Sensible things, ordinary things, are derived from these forms lesser copies"

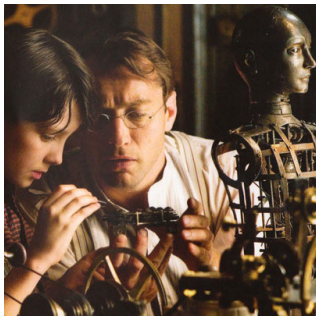
Figure 2.5 (opposite): Primitive tribe in Nigeria, Africa

(Sharr, 2007, 29). To him, these abstracted truths are generated by the scientific world view, which is limited in explaining ‘the thing’. This world view, that the western world followed, can only measure the function and purpose of the thing based on dimensions, volumes, and weights. On the other hand, the ‘thing’ should be measured or valued in terms of its usefulness, based on our individual interpretation towards it. For the architects, this ideal is particularly important as we experience both architecture and its representations in our everyday task or experiences.

Heidegger’s notion of the ‘thing’ and the distance created by the object suggested that it is important for architects to establish a close relationship to architectural representations in an everyday scenario. From Heidegger’s perspective, the purity and the timeless qualities of many contemporary architectural representations are only secondary as they would only remain as visual ideals and are far removed from the daily practicalities of use (Sharr, 2007, 29). Here these architectural representations, for the everyday, refer to the little doodles done when bored, napkin sketches drawn at a restaurant or the iterations of concept models assembled out of studio scrap, these are made on a daily basis both consciously and sub-consciously. For the architect then, it is extremely important that these architectural representations remain close to us, and are not being observed as objects. Heidegger’s distinction between the thing and object encouraged us to develop a



relationship with not only the object we make but also the work we do. Moreover, it is only through the act of making and the design process, that architects are be able to encounter unexpected solutions and hints appearing as divine interventions.



Heidegger's interest in understanding the thing follows that of the ancient Greeks. At first glance, his meaning of the thing seems to be a direct reference toward the Greek philosophers' theory on metaphysics. While the Greeks suggest looking beyond the physicality of the object, Heidegger's 'thing' may refer to both an embodiment of the thing itself as a physical object and the hidden wisdom that can be understood through living experience. Heidegger further explained how the relationship between the 'thing' and the human experience is like a near spiritual condition. The 'fourfold' was termed for this basic condition of existence linking human experiences to things around them. Heidegger set up the fourfold to include earth, sky, divinities and mortals as the basic circumstances that allows things to be experienced (Sharr, 2007, 39). Although there was no explanation regarding each of the terms, the fourfold explained how things are able to be sensed beyond its material and physical measures. Through an interactive 'mirror-play' that exists between these terms. This was "an inevitable reflection of one another that was the primary pre-condition of existence" (Sharr, 2007, 31). To explain the 'mirror-play', Heidegger used an example of an everyday jug. He argued that the jug contains spiritual properties beyond its ordinary function as a container. The jug can be scientifically measured and defined by its volume and size, but its spiritual character can only be revealed through the use such as the act of pouring. The use of the jug is an everyday act, an act that can only be activated by people (Sharr, 2007, 28). An intimate relationship between humans and their environment seems to be established: we are capable of activating spiritual properties of things through using them, in the same time it is because things already embodied within them spiritual qualities that we are able to reveal it through use. The suggestion of an inner-reflective interaction not only establishes the connection between things, it also highlights the fact that humans are enmeshed within this naturally evolved intertwining web with little or almost no control over it.

Figure 2.6 (above): A scene from the 2011 movie 'Hugo'. The automata was revealed in the film to be the key link between the protagonist and the deuteragonist.

Figure 2.7 (opposite): 'The Ghost Architectural Laboratory' of MacKay-Lyons Sweetapple Architects Limited focuses on design-built aspect of architecture.

This idea of the powerless humans residing within an already existing environment is also demonstrated in E. H. Gombrich's writing on the lives of the primitive people. These people saw "no difference between building and image-making as far as usefulness is concerned" (Gombrich, 1985, 20). Their prime concern was not of the timelessness of the things they made, but on the thing's performance of practicality towards protecting them against their surrounding environment of the moment. Gombrich further discussed how the primitive people saw in the things they made to possess equal powers of the divine as they are "made to protect them against other powers which are, to them, as real as the forces of nature" (Gombrich, 20). The things that the primitives made are close to them simply because it was the only method from their perspective to ensure safety and shelter. In the same time these things they created also protect them from the spirits of the natural world. They were aware of the divine powers of nature and accepted for a fact that these elements had already existed before them.

It is important for the architect to develop a sense of acceptance toward the natural powers imposed by the environment that is beyond their control. This includes the 'Deus ex Machina' described in the previous chapter, where the 'god from the machine' appears in the form of seemingly divine interventions that we experience as a result of the work that we consciously and sub-consciously done (fig 2.5). It is not to suggest that we should not be concern about the constructed architecture around us and rely solely on celestial interventions. But it

highlights and validates the necessity for intense human experience with our surrounding designed environment, allowing us to develop physical as well as emotional bonds with them. Both the making of architecture and the understanding of the built environment is not something that can be completed simply through studio practices alone, but it should be accompanied with experiential visits on a daily basis, to understand how architecture is lived, inhabited and acts to sheltering. This should be understood as the underlying basis for architecture.

In the previous chapter, Porter established the capacity for the human body to ‘see’ the surrounding environment. According to Juhani Pallasmaa, our relation with architecture should be in such a way that “every touching experience of architecture is multi-sensory; qualities of matter space, and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscle” (Holl, 2006, 29). What Pallasmaa had set forth, was a standard procedure to experience space which he believed to be the basis of architectural principle. He tried to establish a parallel between of the importance of experiencing architecture in the same manner as Heidegger’s fourfold, that the body is capable of triggering and revealing the spiritual, or divine, or the inspiring qualities of architecture, a building or things. “The act of construction”, as he wrote, “evokes mythical perspectives” (Mackay-Lyons, 2008, 143) (fig 2.6). To Pallasmaa, the architect obtains spatial experiences through making. The process of building and making not only relate the builders to the occupants to the natural environment, it simultaneously connects the past and to the future through the creation of spaces in the presence. He describe this process of “orienting the building in relation to the sun, land, and the winds, water, and views, as well as breaking into the earth collaborating with matter and gravity, balancing forces with structures and connections, constitutes a primordial rite, the dance of construction” (Mackay-Lyons, 2008, 145).

2.2 experiencing as craftsmen

Heidegger suggested that our relationship to things can be enhanced by the intense experience we gain as we are being close to them. From Japanese author Jun'ichiro Tanizaki's book 'In praise of shadows', a parallel can be drawn as he experiences architectural aesthetics from a personal perspective. He commented how "the beauty of the Japanese room depends on a variation of shadows" (Harper & Seidensticker, 1977, 18) (fig 2.6). Darkness is so intensified in the strong shadows of the Japanese alcove that "we are overcome with the feeling that in this small corner of the atmosphere there reigns complete and utter silence" (20). Feelings and emotions towards one thing can be triggered through experiencing its intense contrasting opposite; we cherish life as it is highlighted by the intense feeling towards death. For architects, Pallasmaa believed that this intensive contradiction created through architecture can be used to clarify and intensify the obscuring and distracting lived environment. Architects are tasked with the duty to create "intensified sense of reality, not sentimental journeys of fantasy" (Mackay-Lyons, 2008, 146).

Figure 2.8 (above): Light and shadows of a traditional Japanese house.

senses of the craftsman

According to Pallasmaa, the architect's senses toward the surrounding environment can be intensified through the act of making things, a process that is simultaneously creative and destructive. He wrote: "the very act of building always demolishes and wipes out something that has existed at the same time that it reveals and creates something new" (Mackay-Lyons, 2008, 145). He believed the skill of the architect is measured by his/her ability to balance these opposite, as architecture itself "prohibits as it permits, restricts as it emancipates, closes as it opens" (146). Architects perform a 'dance of construction' using their bodies as the medium to balance, orientate, and coordinate between forces of the built structure and those from the natural environment such as gravity, sun, and wind. This establishes the importance of the body in construction.

Our bodies are capable of multiple tasks, with each part performing a specific function. Of our entire body, our hands are particularly valuable in performing routine tasks of the mundane everyday as well as meticulous tasks that requires great precision and accuracy. Pallasmaa showed particular interest in the hands of the architect. He believed that the tradition of craft should be revived in architecture, in which architects would be able to understand both their bodies and their design philosophies through the act of making. Architects should behave like craftsmen because "the skilled practice of a craft involves imagination with the hand, every masterful exercise of craft projects

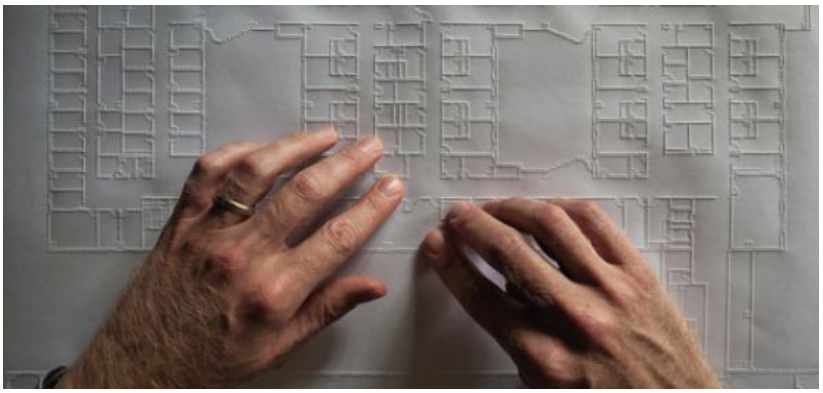


Figure 2.9 (left): Chirs Downey sensing plans printed in Baille dots.

determined intentionality and an imagined vision of the completed task or object at hand" (Pallasmaa, 2009, 52). The craftsmen shows tremendous respect and devotion in the profession they operate within, with knowledge of their hands, tools, and materials. American architect Chris Downey was blinded by a sudden tumor that wrapped around his optic nerves (McGray, 2010) (fig 2.7x). His disability allowed him to evolve a kin sense of his own body and hands which he learned to rely on his hands alone to understand and experience drawings. With special plans printed in Braille dots, he is able to walk the space with his hands and understand it through imagining with the image of his body movement. Much like the situation anticipated by the architect of Gallery Tom in Tokyo, Downey's sense of touch was able to overtake and replace his visual receptors. Downey's determination allowed his hands to extend the reach of his brain.

extension of the craftsman

Much like craftsmen working with their hands in contact with various tools and materials, the majority of the architect's work involves the hand by drawing sketches, building models or handling the computer. The hands of the architect are always associated with various kinds of architectural tools, either to operate or to develop them. From Pallasmaa's perspective, the knowledge of the brain and the skill of the hand are the result of the development and evolution of tools. He identified the significance for the use of tools, claiming that "the human brain could have evolved as consequence of the increase in tool use" (Pallasmaa, 2009, 34). Much like the hand acts as an extension of the brain, the apparent similarity between the hand and tools is that tools extend the reach of the hand. According to Pallasmaa, this relationship creates a phenomenological effect on the hand as such that "the tool is an extension and specialization of the hand that alters the hand's natural powers and capacities" (Pallasmaa, 2009, 47). When architects are in contact with their tools, their hands and tools merge to become a 'tool hand'. This merge is especially prominent when the architect becomes exceptionally determined in their work,

as described in Pallasmaa's quote by philosopher Michel Serres, "the hand is no longer a hand when it has taken hold of the hammer, it is the hammer itself" (48).

Our hands are able to provide directly to the brain the sensations of what we touch and make, which is a feeling that no other body part can provide. Pallasmaa implied that the understanding of materials is central to the tradition of craft as it directly connects our bodies to the environment through sensual experiences. Our understanding of materials we work with demonstrates how much we understand the world. He believed that the craftsmen should work with their materials in such a way that they follow its lead, as he quoted "we must not try to make materials speak our language, we must go with them to the point where others will understand their language" (Pallasmaa, 2009, 55). Artists and sculptors often create what they refer to as 'tactile paintings' that rely on the sense of touch and the feelings of the hand to synthesize the look and form of their work. For the architects, models provided a similar tactile experience.

Usually in small scale, the physical models allow the construction of multiple versions. Their versatility and ease of construction makes them incomparable to sketching out quick ideas, to claring concepts, to comparing and analysising ideas, or presenting form. According to Pallasmaa, "the model both concretizes and externalizes ideas, the frequently diminutive scale of the model and the observer's externality

Figure 2.10 (left): Renzo Piano Building Workshop web site, showcasing various tools and models.

invites and permits the identification and judgment of aspects that could otherwise be lost" (58). Physical models allow architects to become craftsmen as they are both a tool and material to the architect. Architects use them like tools to communicate ideas as physical expression, at the same time they demonstrate our understanding of the material environment through their constructions (fig 2.8). Models, in a sense became the extension of architects hands and mind. Through their physicality and materiality, they reach out to our surrounding environment while they aid us in exploring our own internal mindset.

2.3 An essay on memory

We know of memory because we are able to remember things that have happened, images we have seen, or food we have tasted. Yet in the same time, our memory often proves to be unreliable as we forget where we have put things, or fail to recognize faces. Memory can be interpreted in ways. Some have suggested memory is like a filing cabinet, where information is stored as files in specific drawers and are able to be extracted when the drawer is opened (Abumrad, 2007). In this scenario, it is possible that when the file is lost, or when it is misplaced we have simply forgotten where it was located. Another metaphor suggests that memory operates like a computer, with things stored as binary codes that never change and can be easily retrieved with the correct address (Abumrad, 2007). Yet in reality, this is often not the case as the things we remember are different from that we experienced. By definition, memory is the faculty where we store and remember information (Stevenson, 2010). In recent years, scientists have developed a new interpretation of memory, one that redefines memory not only as a storage faculty of information but also for the creative imagination.

Through history, humans as well as animals evolved the ability to remember. From Frances Yates, we learn that the ancient Romans

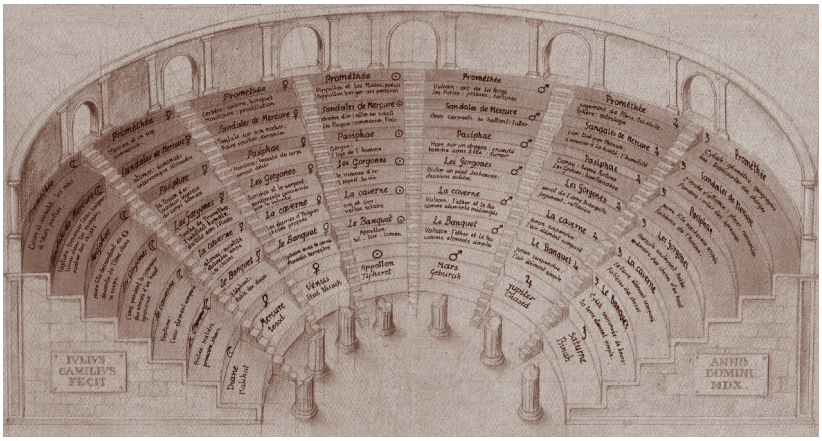


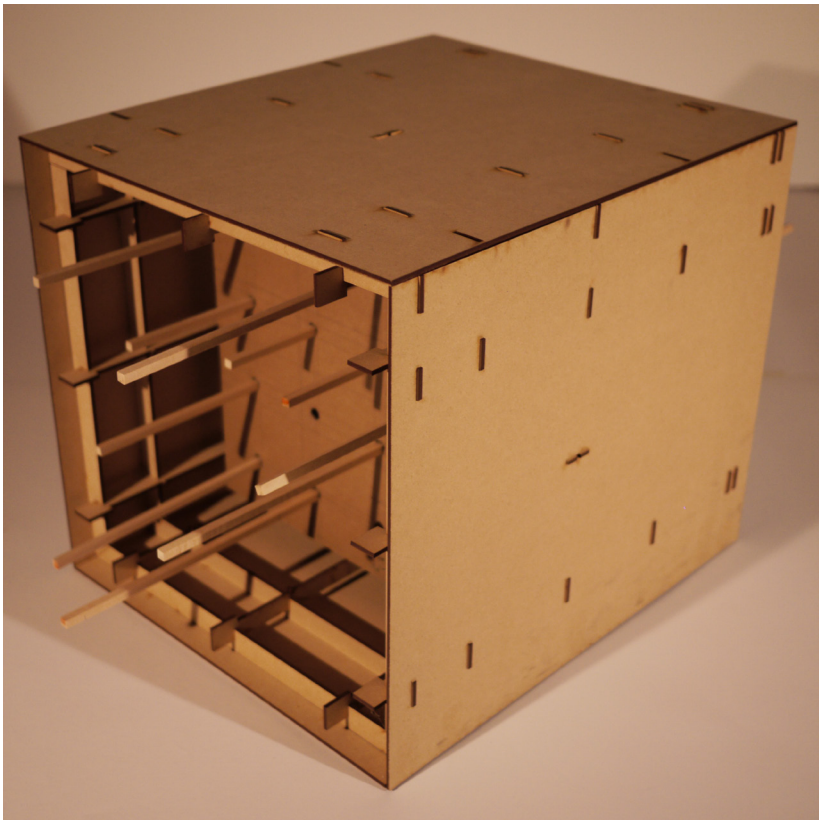
Figure 2.11 (left): Memory Theater proposed by Giulio Camillo. Audience enter the theater onto the stage, and look onto the seatings of theater.

had developed particular skills to aid memory. The mnemonic devices, as they are called, are based on the principles of association (fig 2.9). She suggested that our ability to remember can be enhanced through emotional stimulants. As she explained: "the idea of helping memory by arousing emotional affects through these striking and unusual images, of human figures wearing crowns or purple cloaks, bloodstained or smeared with paint, of human figures dramatically engaged in some activities – doing something" (Yates, 1966, 10). Our memory then clearly associates with emotions and experiences as it recalls the original event. Yates' idea of memory suggested that ordinary things are usually easily forgotten while the striking and the novel things could stay longer in the mind as they create a stronger impression. Similarly, the mnemonic devices she described, are based on the association between locis and imaginibus. A locis is a place or building that is familiar to us and imaginibus (or images) are things that we want to remember. The method of loci associates images to the individual rooms of the familiar building. By associating the two, we are able to extract the image as we remember the rooms of the building. This means that memory can be recalled.

Cognition utilizes memory to recognize patterns between images. We are able to tell if a tree is a tree because we are able to associate the tree we are viewing with the image of the tree we have already seen and stored in our mind. We remember something because of our experiences, either as an event we been through, an image we saw, something we touched, a place we been to, or food have we tasted. Professor of psychology, Gary Marcus, described this as the contextual memory. Marcus suggested that memory is affected by our sensual experience, things that we seen, done, touched, heard and tasted are all added to our memory bank. When we are under the correct circumstances, such as a similar situation or event, the image can be extracted. As Marcus described, "we pull things out of our memory by using context or clues" (Marcus, 2009, 21). This suggested that the recall of memory can be triggered by environmental stimulations.

Our minds have evolved to operate on their own as they prioritize memory according to the recurring situation. Marcus described that

“things that are common, things that we’ve needed recently, and things that have previously been relevant in situations that are similar to our current circumstances” (Marcus, 2009, 22). This act of prioritization is autonomous for the brain as it requires no special training. It responds to whatever our brains receive from the environment. The more cues provided from the current situation, the more clear and intense the memory can become. Most of the time, we are only able to remember bits and fragments-just enough to assemble a general image. Details are often distorted by the environment, causing confusion in our thinking. Our ability to remember is also affected by our behavior. A situation that is repeated will always provide the strongest images in the mind, at the same time, become easiest to be remembered. Our habits often override particular memories that are not part of the routine. Marcus explained “the behavior that is common practice trumps the recent goal” (Marcus, 2009, 31).



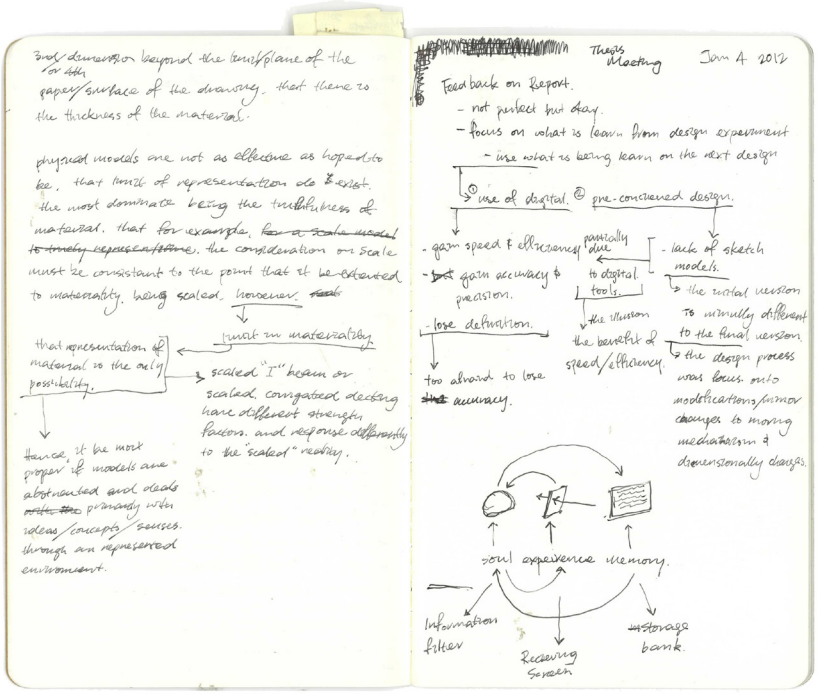


Figure 2.12 (opposite): 'Memory Machine'.

Figure 2.13 (above): Initial sketches and notes showing a conceptual relationship between memory, experience and the soul.

However, recent scientific studies have shed new light on the subject and help to explain memory. Neuroscientist Joseph E. LeDoux conducted scientific research and a series of experiments on animals, and later with Karim Naer, find out that memory can be manipulated, altered, and even erased. They discovered that memory is a cellular construction of proteins created between neurons in the brain. A new connection is built every time we experience something. They discuss a drug that is capable of erasing a memory when it is being created as well as when it is being recalled (Abumrad, 2007). They concluded that there is actually no real structure to memory and remembering is merely a reconstruction of the original event. What this actually means, is that each time something is being remembered, it is actually a brand new memory. Memory becomes a creative process. It is an act of reconstruction with everyone being their own artists. We take bits and pieces of experience, mixed with our imaginations, and out of that construct what feels like a recollection. Naer suggested this process is very much an act of imagining that "every time you remember something, you are changing the memory a little bit we are always changing the memory slightly, you think you remember something took

placed 30 years ago actually what you are remembering is that memory reinterpreted in the light of today, in the light of now" (Abumrad, 2007). To the scientists, memory becomes impossible to verify and it would never be true. The more something is remembered, the less accurate it will become. The original event vanishes the moment it happens; the image that we are left with would diverge into our separate brains and grow slowly further and further apart-until we are left with fragments of the event, enough bits and pieces to allow a reconstruction of what is thought to be the original event. The memory becomes more about the individual and less about what actually happened.

Exercise two, called the 'memory machine' (fig 2.10), was built on the understanding that memory is based on a contextual associative experience. This machine looks specifically into the memories associated with the sense of touch and body. The memory machine appears as a plain box. Encased within is a puzzle which is only accessible through the rods. To solve the puzzle, one must rely on their sense of touch, experience the process and imagine how the puzzle would turn out-a process that would only be remembered by the body. The intension is to demonstrate the concept of memory set by experience. The same experience would then later trigger a memory recollection to perform and operate the machine.

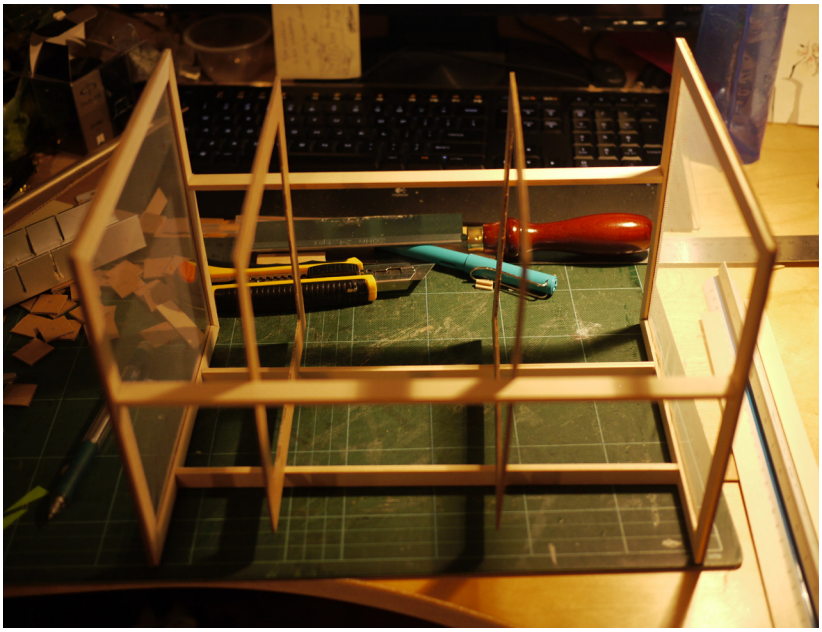
As mentioned previously by Gary Marcus, memory can be affected by behavior and extracted through cues and hints. The 'memory machine' is intended to isolate a particular sense, vision, to enhance the experience of another sense, touch, in order to increase prominence of the event being remembered through that sense. The medieval master-builders passed on their knowledge and skills, not in schools, but in the actual workshop or construction site. Their apprentices

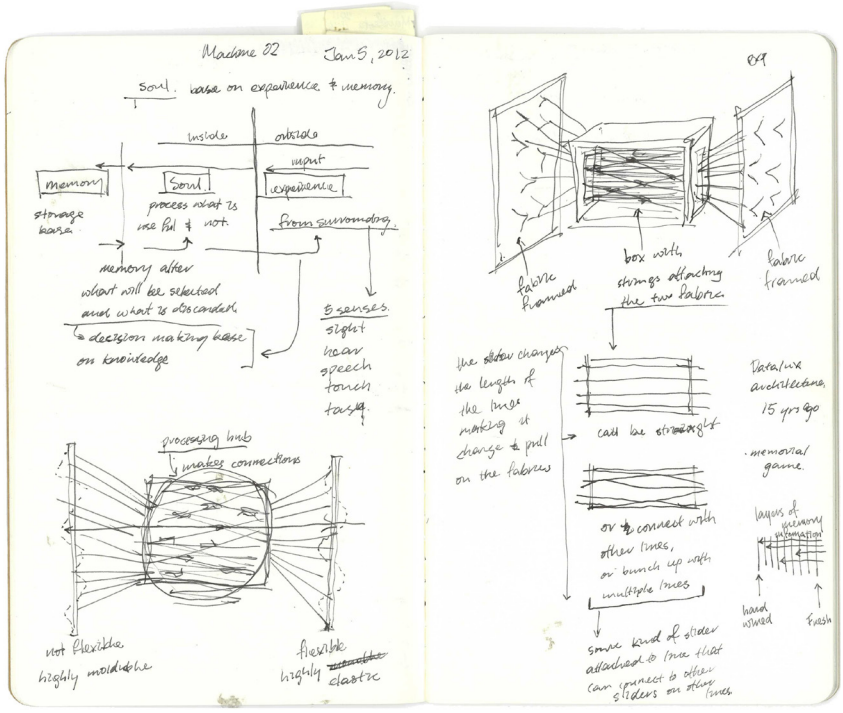
Figure 2.14 (above): Sculpture at the base of the 'Quattro Santi Coronati' on the exterior wall of the Orsanmichele, Florence. Created by Nanni diBanco in 1408, it depicts a sculptor's workshop with masters and their apprentices.

Figure 2.15 (opposite): early stage of the initial concept model for the 'Memory Machine'. The left screen represents experience, the right screen represents memory, while the space in the middle represents the soul of the individual where judgements occur.

learned through mimicking the actions of their masters (fig 2.11). The repeated bodily movements provided the apprentices the best and most direct clues to the creation and extraction of memory. As Pallasmaa described “learning a skill is not primarily founded on verbal teaching but rather on the transference of the skill from the muscles of the teacher directly to the muscles of the apprentice through the act of sensory perception and bodily mimesis” (Pallasmaa, 2009, 15). Once something is learned through doing or making, the body remembers it. We are able to learn from what we have done, where we have been to, places we have walked through, since the body acts as the autonomous mnemonic device for the brain to access context.

The very act of remembering is a reconstruction of the initial condition, much like the way we see. Although our brains are capable of storing large amounts of information, we can only access portion of it, and it requires key frames of the original event. Each act of remembering becomes an iteration of the previous re-enactment, and each time would be slightly different. Harvard psychologist Dan Schacter saw this process as a way the human body anticipates the future, he described: “a memory that works by piecing together bits of the past may be better suited to simulating future events than one that is a store of perfect





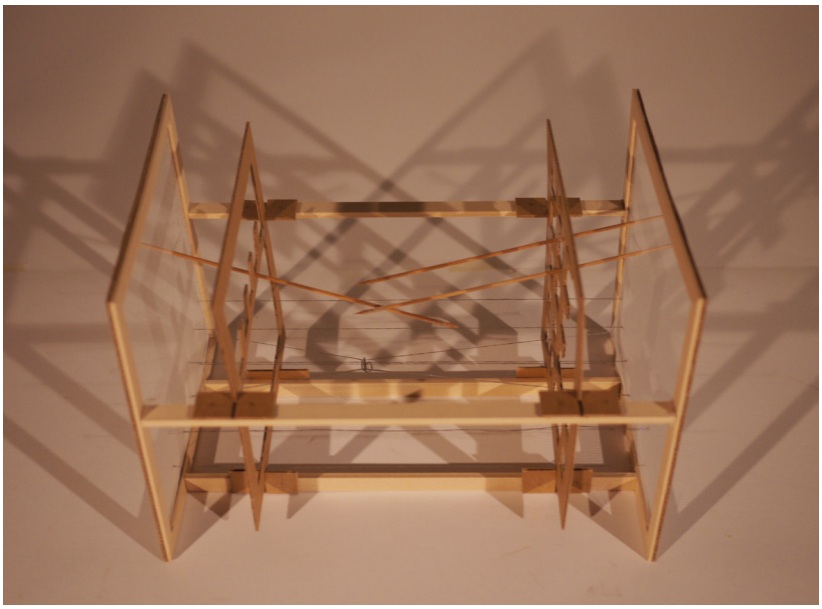
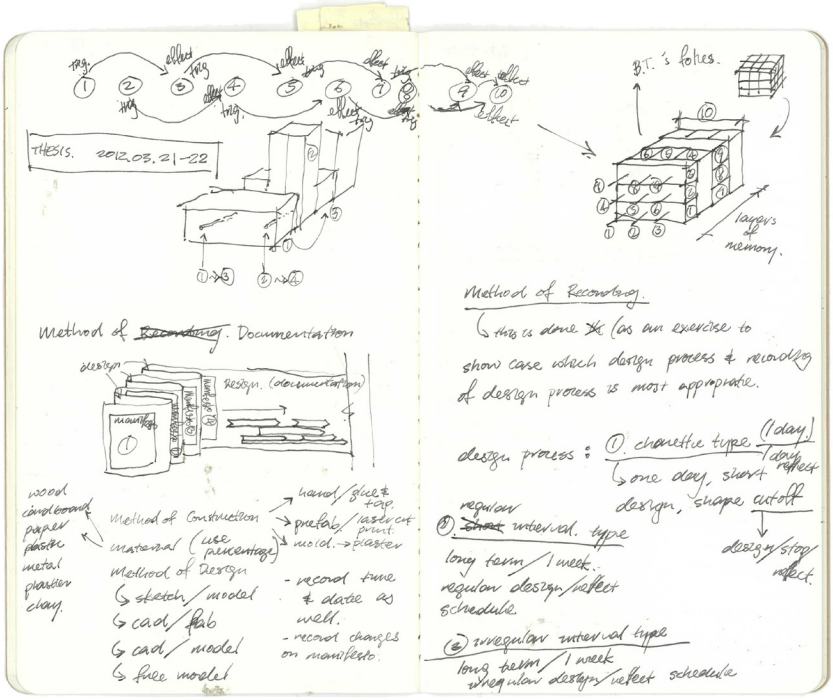


Figure 2.16 (left top): Initial sketches of the first 'Memory Machine', following that from the previous sketches of the conceptual relationship between memory, experience and the soul.

Figure 2.17 (left): The early version of the 'Memory Machine' following the sketches above.



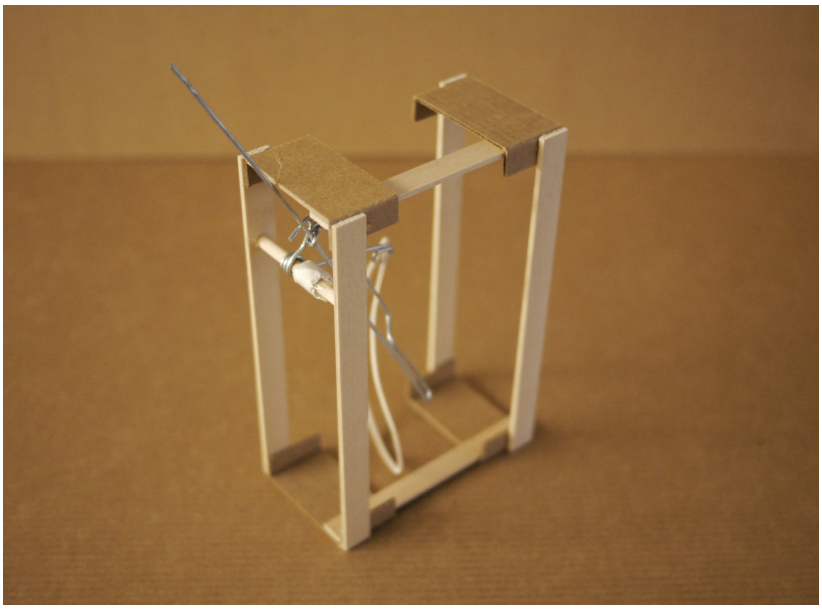
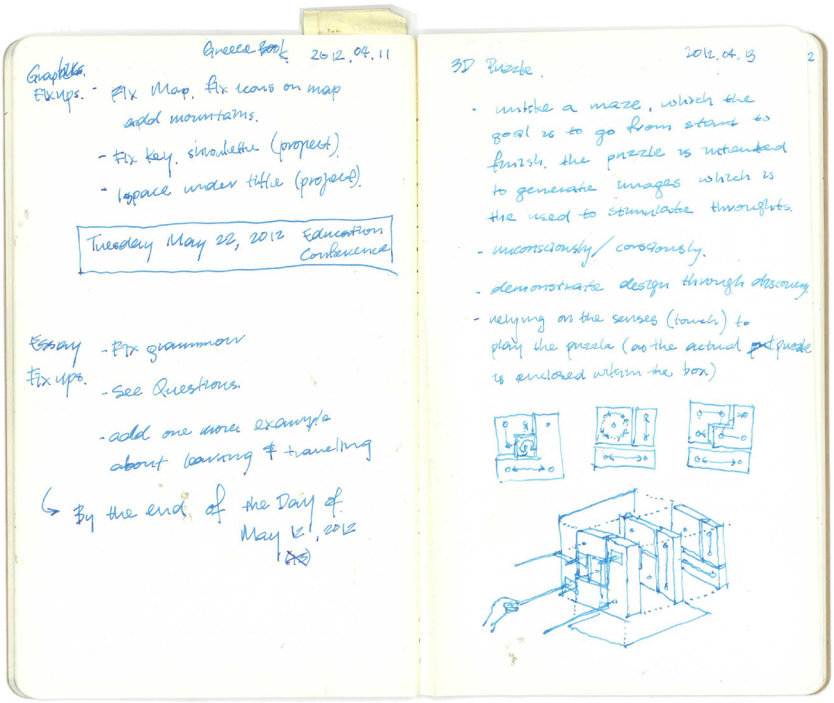


Figure 2.18 (right top): Sketches showling the combination of blocks that build up the 'Memory Machine', each bock will house a mechanism that moves a puzzle piece through simple mechanical motion. The design of the 'Memory Machine' was revised, the middle section (representing the soul) has been replaced by smaller mechanical blocks.

Figure 2.19 (right): A study of one of the mechanical blocks, the 'Memory Machine was to have twelve of these blocks organized together.



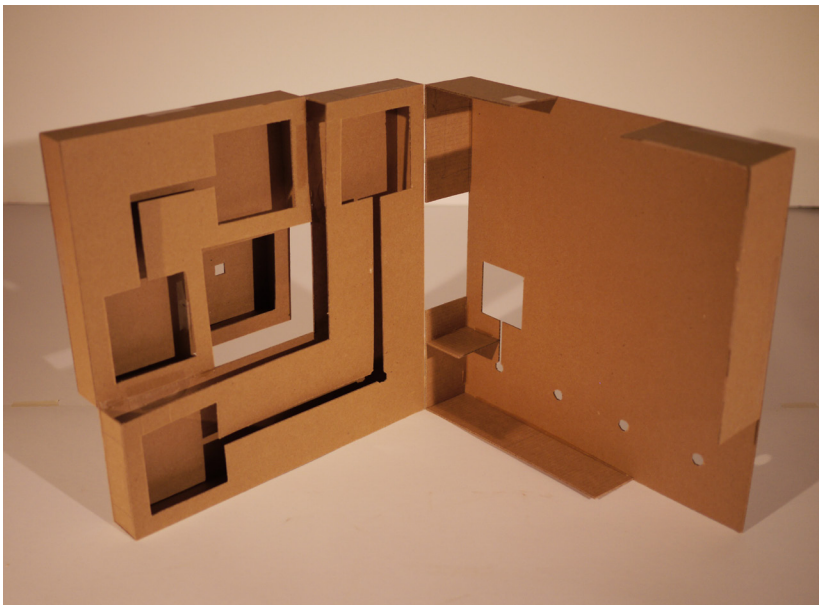
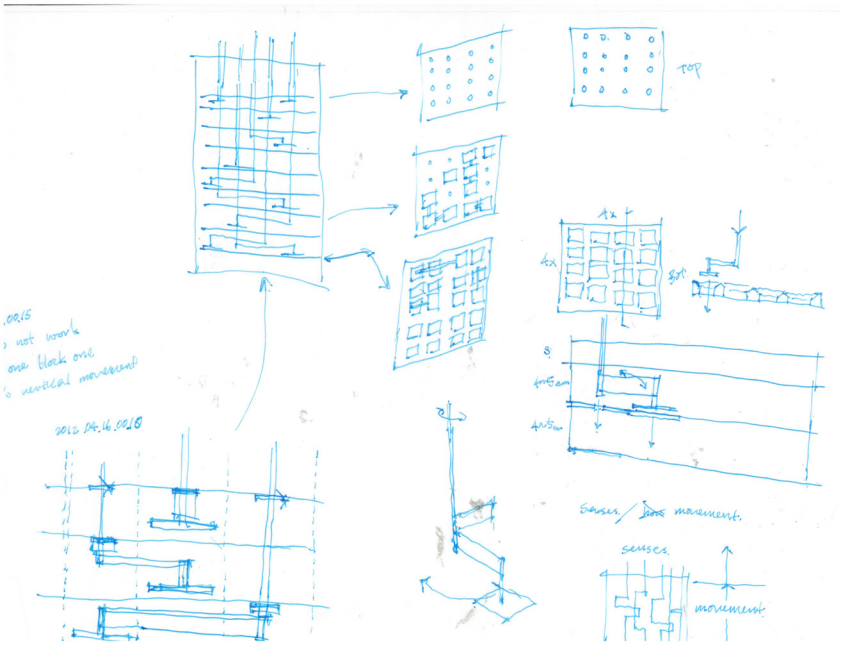


Figure 2.20 (left top): Sketch shows a simplified version of the 'Memory Machine'. The mechanical blocks were replaced with simplier rods being pushed and moved, with the puzzle pieces attached to the end of the rods.

Figure 2.21 (left): Sketch model showling the layout of the simplied blocks with the intended movement paths, the rods will be limited to move along tracks or pre-arranged openings.



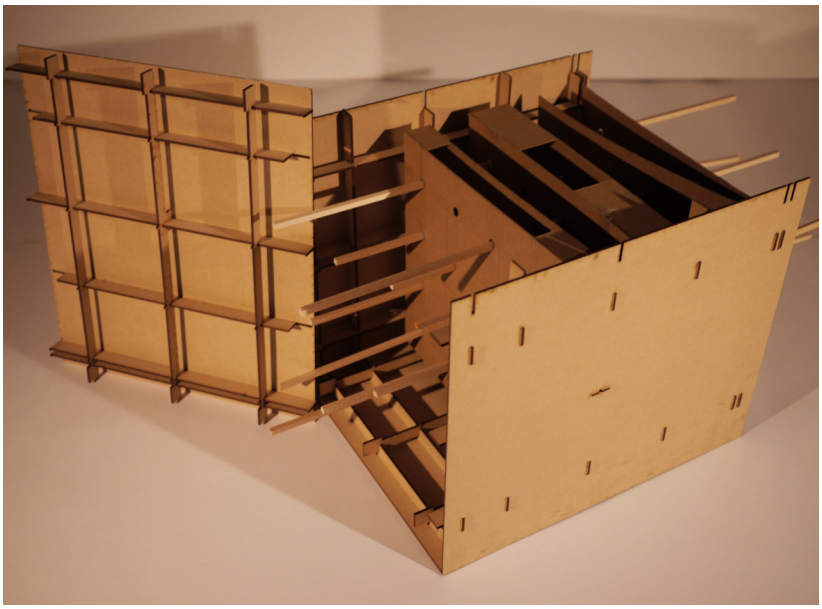
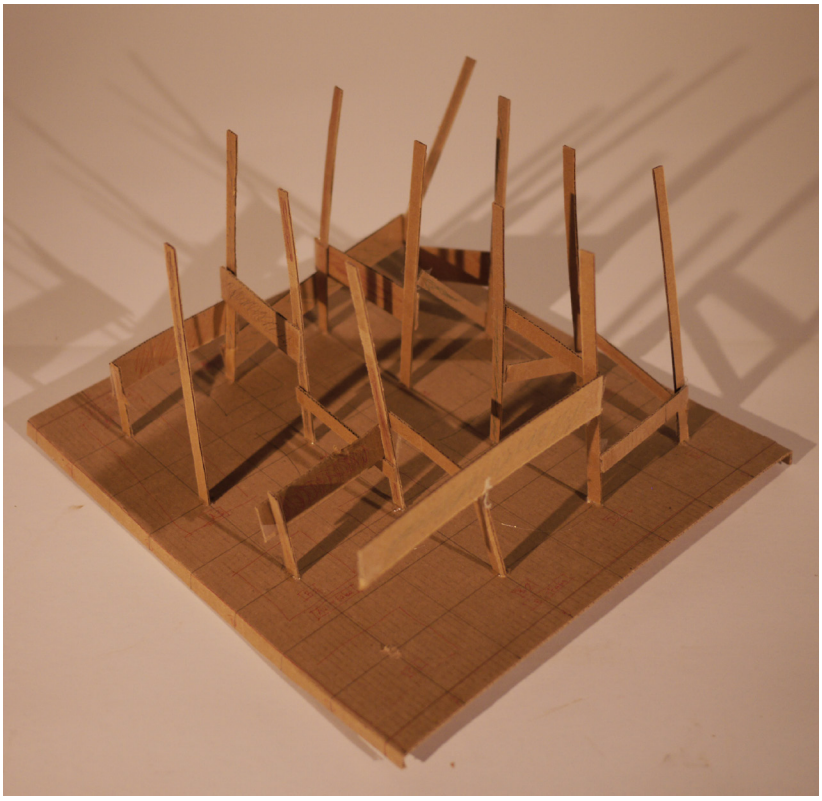


Figure 2.22 (right top): Sketches of the internal mechanism and organization of the layers of tracks and openings for the movement of the rods.

Figure 2.23 (right): First attempt in materializing the internal mechanism, the rods are able to slide through the holes but experiences difficulties when moving along the tracks.



records” (Marcus, 2009, 37). The idea of the memory machine was to create a metaphoric situation as our memory. We have established in previous chapters that our vision is very limited. We can only see key points of an image, while the entire picture is constructed through the cognitive and associative powers of the brain. Similarly, from the experiments of the scientists, we learn that our brains can only provide a limited amount of information given the correct stimulation; all we can obtain from the surrounding environment are bits and pieces. The same situation was created with the box. People only gain limited amount of information through its use in solving the puzzle using their sense of touch only so that we are able to enhance and fully utilize our ability to imagine.

Evolution gave humans memory, an ability that is useful (to remember where the keys are) yet limiting and unreliable (as we sometimes forget or misplace the keys). However, it is also because we can only remember fragments of events and images that simultaneously

enhance our ability to imagine. Only remembering general things but never the details allows our imagination to autonomously fill in these gaps.

The making of the memory machine has proven to be a testing ground for a transition from the use of computer design environment to begin a reliance on the senses of the body. My routine procedure for any design project before this exercise, and especially the ‘truth machine’, was to begin with sketches and then move directly onto computers. This method had became a reflective instinct that it was hard wired to

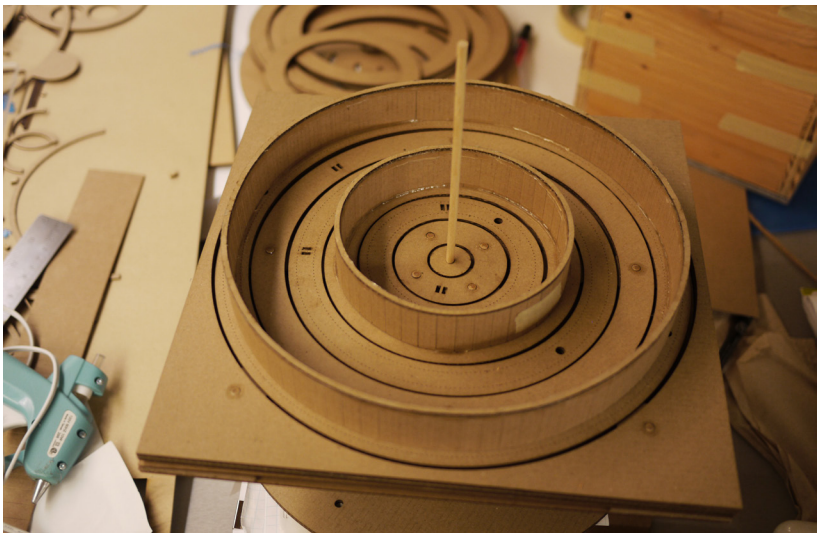


Figure 2.24 (opposite left): Sketch model for analyzing and organizing internal mechanisms, each strip represented one piece of the puzzle.

Figure 2.25 (right top): Model showing a revised puzzle mechanism, the previous version is much simplified from mulitple layers into one. The puzzle is no longer attached directly to the rods, but are driven by a series of rings that are operated by the movement and rotations of the rods.

Figure 2.26 (right bottom): Model showing the housing for the movement mechanism, the rods still move along the track and rotate as previous version, but the system is much simplier into one layer.

my body, and I did not have any second thoughts towards reviewing and questioning this old procedure of work. It becomes part of the autonomous responses for the body in cases when the mind forgets. The body is able to subconsciously react to the situation. Automatically producing and reenacting the original activity. The making of the memory machine has forced a sudden change from the routine procedure with a heavy reliance on computers, to directly using and relying on only sketch models to experiment with the design. This has become the biggest challenge in completing this thesis. The difficulties arise not from the making and imagining the 'memory machine' with models, but from restraining myself from using any form of hand sketch and computers in the design process. This exercise reveal the difficulties in manipulating a set of very well embedded body memory and overwrite it. It resulted in an inaccurate translation from images formed in the mind to the making of the actual model, as the limits of the real world would sometimes confuse and oppose the desire shape of the image. This called for a number of sketches to help visualize thoughts between models and fill in these gaps created by the sketch models allowing the flow of the process to continue. The exercise took more time than expected to produce, and result in less physical work, since most of the struggle existed in the transitional realm between the free flow imagination and the limits of the real world.

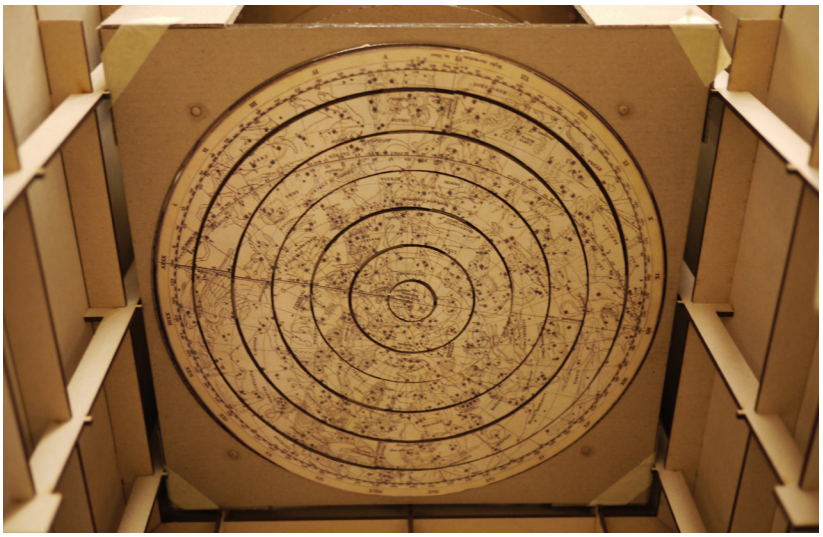
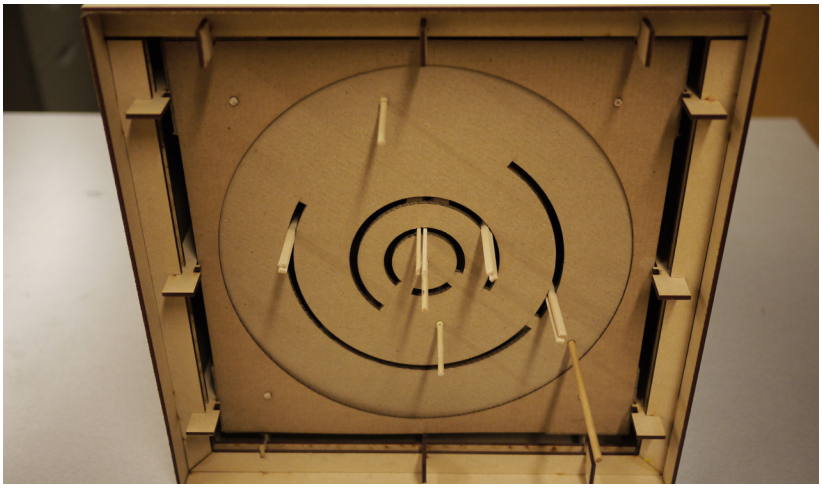


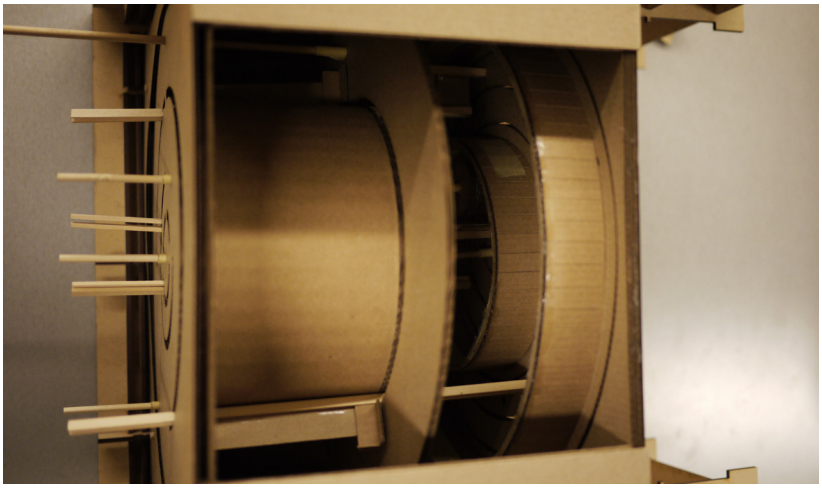
Figure 2.27 (above): View of the puzzle at one end of the machine, it is attached to a series of concentric rings that are able to freely rotate. These rings are moved by the rods.

Figure 2.28 (opposite top): View of the control panel of the machine, each rod is independently operating a seperate ring of the puzzle.

Figure 2.29 (opposite middle): View of the internal mechanism, these rods can be moved to operate the puzzle.

Figure 2.30 (opposite bottom): View of the internal linkage between the control panel to the turning mechanisms.





Chapter 3:
imagination

3.1 recognition of the self

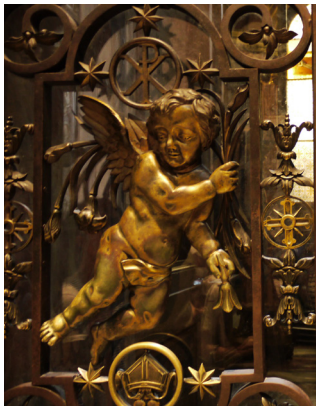
The current world is perhaps only possible because of our ability to imagine. Our imagination is one of the contributing factor that lead to the innovation of tools, the creation of the social system, as well as everything else that followed (fig 3.1). Imagination, in a sense, brought us out of the stone age and propelled us through history into the present world. Our imaginations prevented us from following only pre-set guidelines, allowed us to think beyond the limites of the world, and advanced us from the Stone Age to the present. According to the Oxford Dictionary, imagination is the faculty of imagining, which is the formation of metal images of ideas and things that are not in physically present. (Stevenson, 2010) The dictionary definition suggests that imagination always begins as an image in the mind. However, these images must begin somewhere. The ancient Greeks believed these images originated from the understanding of self, which were believed to be stories the brain constructed for the body.

Dr. V.S. Ramachandran, a neuroscientist known for his work in behavioral neurology and visual psychophysics explains the relationship between imagination and the self, he commented that “what is peculiarly human about us was our ability to construct stories” (Abumrad, 2007). He believed this ability happened relatively recently compared to the history of the universe. He called this the evolution of introspective consciousness. To explain this idea, he compared a simple animal such as a worm with a more advanced animal such as a monkey. A worm does not have a brain strong or large enough to support the idea of an image of itself nor images of the things around it. For the worm, there exists only inherent instinctive responses to environment. It also suggested that for the worm when there is

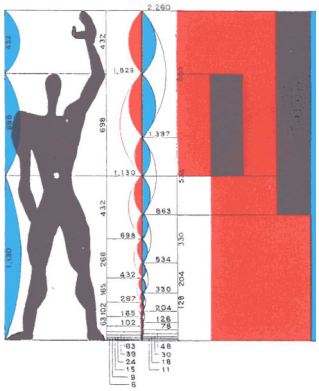
Figure 3.1 (opposite): Renaissance tools used for the construction of the Basilica di Santa Maria del Fiore, Florence.


4

no story because there are no images in the worm's mind. On the other hand, a more advanced animal like a monkey is capable of recognizing images around it and react to what they experience. It is able to pull in images from the environment and make association to itself. A monkey is able to make an image in its head. However, it is not capable of juggling and altering these images. Humans, on the other hand, are not only able to associate images, but also to recreate images. Not only we are able to reconstruct within our minds, but this ability is extremely easy for us to do. "Only human beings are able to take images from their surroundings, divide it into parts, and turning parts into abstractions", as Dr. V.S. Ramachandran commented, "A Monkey can be trained to think of a bird, ring a bell and show it a bird, and the fifth time you just ring a bell, presumably its conjuring up an image of a bird, now you cannot only train a human to think of a bird, you can train a human to think of babies, but now the human can think of a bird's wings on a human baby, conjure an angel (fig 3.2), which is never seen, this is because he is now has what are called tokens, he has created disembodied tokens … and then he can manipulate these tokens, juxtapose them in counter intuitive ways. He can create even outlandish scenarios, what we called the imagination. " (Abumrad, 2007)



Robert Krulwich is an NPR science correspondent who co-hosted the RadioLab episode "Who Am I?" on the idea of self. He commented that "the idea of self, is when one takes all the things that happened around, stitch them together into a general abstract idea. So the idea of self is no more than a story that we tell ourselves, it can be changed from day to day, and allows the human beings to exercise that peculiarly human muscle, to experience stuff, and then to abstract it into a story. That's self" (Abumrad, 2007). What is crucial from this episode is the connection between imagination, self and the body. In architecture, it is important to acknowledge this connection as we use our bodies as referencing standards (fig 3.3). As Pallasmaa described "all artistic effect or impact is based on the identification of self with the experienced object, or the projection of the self on the object" (Pallasmaa, 2009, 132). The body becomes both a receiver and transmitter to the world. Our imaginations hence became the



processors that manipulate incoming information, which are then reflected back to the world in the form of dances, languages, arts, architecture… etc.

3.2 autonomous of the mind

Similarly to Pallasmaa, Marco Frascari also recognized a similar reflective ability in architecture and it is autonomous of the body (Frascari, 2011, 6). Human beings have the capacity to mimic actions by seeing alone. This ability happens as an instinctive action that is for most of the time anonymous to our consciousness. The sight of seeing other people move, creates a simulative reaction that hints and sometimes triggers similar movements. The very act of making architecture as well as experiencing architecture was built upon this understanding of a mirroring action. Frascari described, “Architecture is framed by embodied experience and embodied experience is framed by architecture, it is a mirroring action” (6). To him, this embodied architecture “arises from the coalescing of our brain and bodily experiences” (5).

Frascari believed that architects and other design professions operate through the “practice of imagination based on analogies, homologies and demonstrative metaphors generated by conjectural imaginations” (6). This is fundamentally different from other professions such as lawyers and doctors who based their practice on logical protocols belonging to Cartesian systems. His understanding of conjectural imagination is to have two functions. It is on one side a manager of things we collect through senses, known as “sesnus communis” or amalgamated senses. He described it as “an internal sense by which the complex configurations of objects such as architectural and culinary products make sense” (6). But it is different from our common senses in that it combines bits and pieces through an internal organization that manages experiences from the external world. On the other side it is a reconstructive tool. Similar to the explanations from Dr. V.S.

Figure 3.2 (opposite top): Bronze cupid on a gate in St. Peter’s Basilica, Rome.

Figure 3.3 (opposite): Le Corbusier’s Modular, developed as a bridge between imperial and metric system. It is based on the height of an English man with raised arm.

Ramachandran, Frascari suggested that the human imagination is capable of creation and we subconsciously employ an associative mechanism to configure images between memories and experiences. While Dr. V.S. Ramachandran's theory suggested imagination is capable of image manipulation and alteration, Frascari's idea of imagination suggested that not only it can "reconstruct something absent, but can also re-elaborate the absent in a different composition of forms" (6). He believed that operates as the "craft of image-building" or "einbildungskraft" in German (6), a phrase quoted from the Renaissance alchemist Paracelsus which was developed from the process of daily cooking. That is, imagination as a craft of images generated from a combination between the instinctive intuition of the mind and a collective of understanding in the form of knowledge.

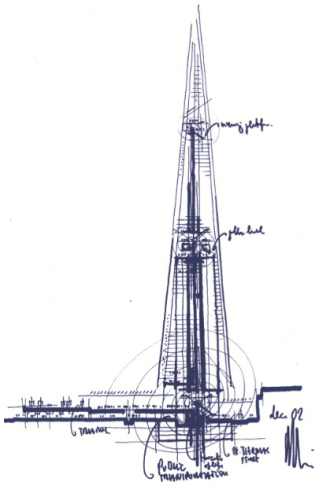


Figure 3.4 (top): Daniel Libeskind's napkin sketch for Royal Ontario Museum drawn while attending a family wedding at the ROM, Toronto. It was claimed that Libeskind was inspired by the museum's crystal collection.

Figure 3.5 (above): Renzo Piano's napkin sketch for the London Shard done in a Berlin restaurant. Piano was inspired by the railway tracks located next to the site.

3.3 thoughts as physical images

The scenes created by our imaginations are not merely random and fantasized images. They are renditions based on the sense of self presented to the mind as proofs of the existence of the body, but most importantly situate the body within the world. Pallasmaa explained that "the architect and artist alike are directly engaged with their sense of self rather than being focused intellectually on an external and objectifiable problem" (Pallasmaa, 2009, 124). We become our work. During the design process, our physical bodies and the work produced are being located within a building environment by which our bodies can refer against. As Pallasmaa described, "we know and remember who we are and where we belong fundamentally through our cities and buildings, our constructed world, the human – architecturally humanized – microcosm" (Pallasmaa, 2009, 128).

Architects and designers often employ preliminary images, such as rough sketches, doodling and abstracted models in the beginning of their work phase (fig 3.4 & 3.5). Frascari believes that we are able to extract knowledge from these early works because of our ability

to recognize forms from memory based on personal experiences (Frascari, 2011, 7). It is in this vague transition area that we are able to recall and associate the bodily encounters from what we have created to what we have seen or experienced. While Pallasmaa described explicitly the focus of architects at work is that they are “not focused on the lines of the drawing, as (they are) envisioning the object itself, and in (their) mind(s) holding the object in (their) hand(s) or occupying the space being designed” (Pallasmaa, 2009, 59). Creativity for architects lies not on the lines of the images or the objects, but in the imaginary space that existed beyond the physicality of the form and between the lines. The physical presence of the objects and the lines on paper facilitated and supported the metaphysical dimension necessary for imagination. For the architect, this mental transfer between the actuality of the drawings and models to the reality of the project and the resulting imagery, as Pallasmaa described, “constitutes a fully haptic and multi-sensory reality of imagination” (59). This is crucial in suggesting that the creative design encompasses the associative connections between the body and imagination provided through models.

Imagination appears to remain as images, in the sense of both mental visions created within the mind and framed scenes captured by the eye. However, Pallasmaa maintained that our encounters with the different images existed in “a fully embodied and emotive manner in the flesh of the world” (Pallasmaa, 2011, 41). This experiential dialog is only possible through an interactive contact with the object in these images and not in the object itself. Pallasmaa explained with Jorge Luis Borges’s description of the poetic reality: “The taste of the apple […] lies in the contact of the fruit with the palate, not in the fruit itself” (41). In describing of the many faces of architectural images, Pallasmaa believed images are meant to provide emancipative stimulants toward the human imagination. Of his many explanations, the image as condensation, the collaged image, and images of incompleteness and destruction holds particular relevance towards the idea of this thesis. His descriptions provided the necessary evidence that establishes the essential relation between physical models and images.

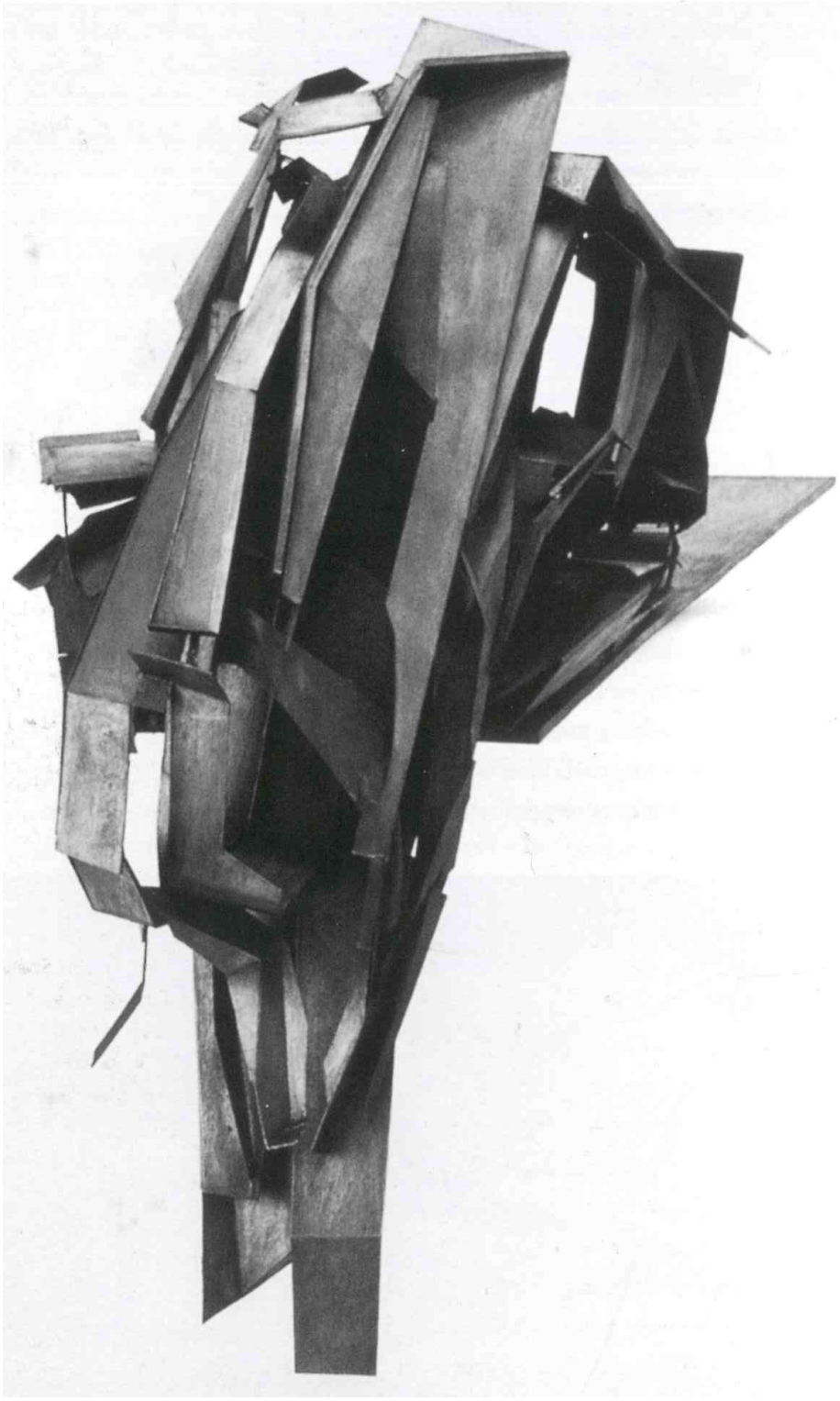


image as condensed abstraction of life

According to Pallasmaa, images that are often labeled as abstractions are in fact condensations of ideas, experiences, feelings, and meanings. He described “instead of abstracting, in the sense of taking away or reducing, the artistic image calls for a compression of a multitude of percepts, memories, associations and existential meanings into an experiential singularity” (55) (fig 3.6). These images compress the sense of life through an “intense interplay between the unconscious and conscious mental faculties” (56). The model is a series of ‘images as condensations’ that resulted from the exchange between the conscious and unconscious mind captured by the eye. Through the conscious mind, the eye saw the essence of the living world as experiences, feelings and emotions. The visions of the unconscious mind provided deeper meanings of the projected self as ideas and concepts. Through this process of familiarization the body is able to develop an intensified experience with the image or the model.

collaged image

The ‘collaged image’, which became a common contemporary artistic practice, was used by many artists since the Cubist period and was associated with cinematic montage. It is characterized as a technique that shows layers of time (73) (fig 3.7). Pallasmaa believes the collage “creates a dense non-linear and associative narrative field through initially unrelated aggregates, as the fragments obtain new roles and significations through the context and dialogue with other image fragments” (72). When initial sketches are drawn, they often appeared in a near collage like manner documenting the brainstorming and idea collection process. These images are, most of the time, fragmented but are important to assist showing sequential information. This is especially the case when physical models are involved in the design process, since it would be impossible to demonstrate the experience of time without using a series of models. The sketches are able to fill in the gaps in between the series of models, continuing the

Figure 3.6 (opposite): Michele Saee’s model for Golzari Guest House, Westlake, CA, 1995-96. The model itself became the abstraction of the imaginative space where it drawn in the architect to dwell within, resulting in continuous reiterations and inspirations.

development of the central idea of the project. This type of image acts as a transitional buffer between the mind and the hand in the initial stages of the design process, in the same time it becomes a recording device for architects.

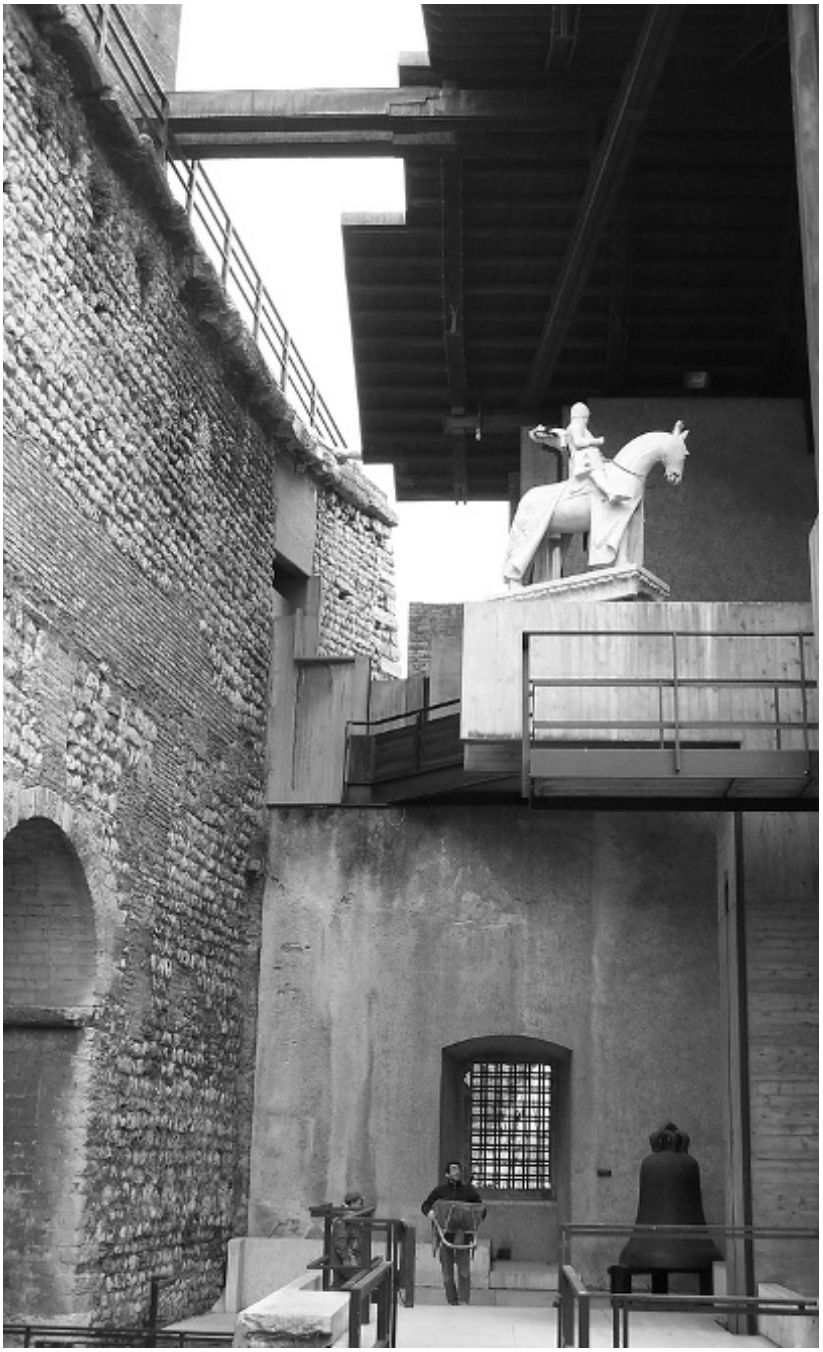
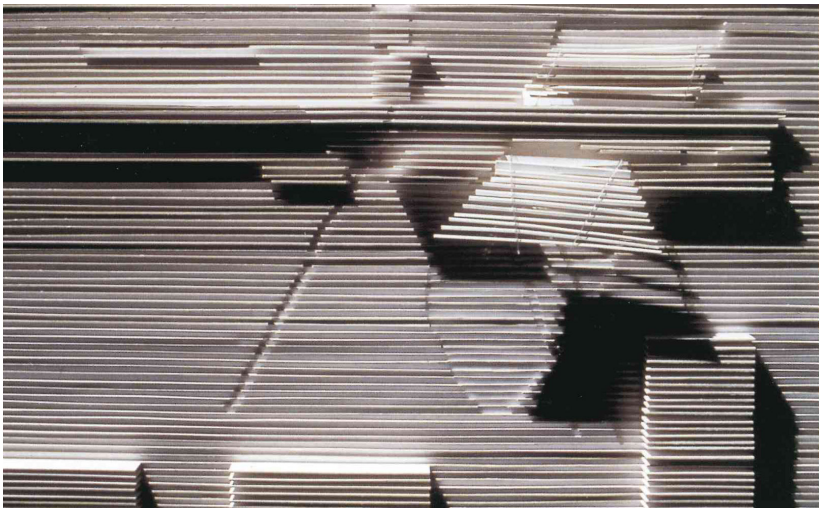


Figure 3.7 (left): Castelvecchio by Carlos Scarpa, restored between 1959-73. This space is called the Cangrand space. Within this view, various modern materials are juxtaposed to the old ruins creating sense of time.

incomplete image

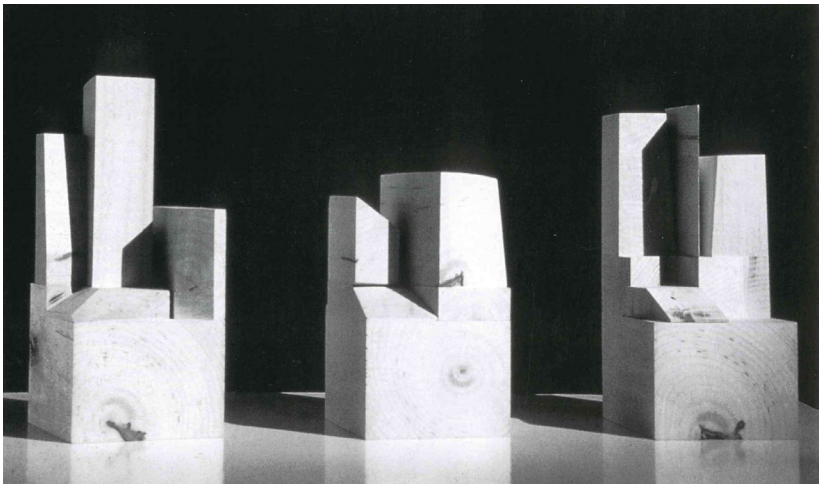
Unlike the previous two images, whose roles were to assist in the development of the design concept, the ‘incomplete image’ was able to participate in the actual design process by stimulating and provoking imagination. Pallasmaa described the ‘incomplete image’ to be much like the ink-blot figures that “invites figural interpretations” and that “these images and their interpretations open up channels to hidden mental worlds” (74). He explained that our perception system is programmed to autonomously scan for meanings from any images we see (fig 3.8). The sketch model is able to produce comparable effect as the ‘incomplete image’. These models are often primitively produced and are embedded with raw ideas following the intuitive flow of the mind. As we review these works, we produce mental images that are compared to images from our memory and past experience. Through both conscious and unconscious processes within our imaginations, as suggested by Macro Frascari, we are able to associate, be inspired, and create new.

The three images are the necessary stepping stones toward any design process with physical models, taking the form of initial sketches and doodles . The making of models requires much more time compared to hand sketches. As mentioned in the previous chapter, the model maker must constantly comply to the limitations of the physical model as if constructing a real building, whether they are material compositions, structural difficulties, or gravity and the natural environment. Sketches and doodles act as transitional buffers between the mind and the hand in the initial stages of the design process. These informal images also become a way to record thought progressions between the making of different models, and in the same time direct our imagination forward.



3.4 thoughts as abstractions

Karen Moon noticed an increasing popularity with representing architectural ideas through abstractions in contemporary architecture even when model making tools are becoming sophisticated. This change is perhaps a realization that drawings alone were unable to provide a comprehensive design process. Architects saw the need for the physical third dimension and the imaginative fourth dimension. As described by NBBJ's model maker Scot Walls, "there are thought



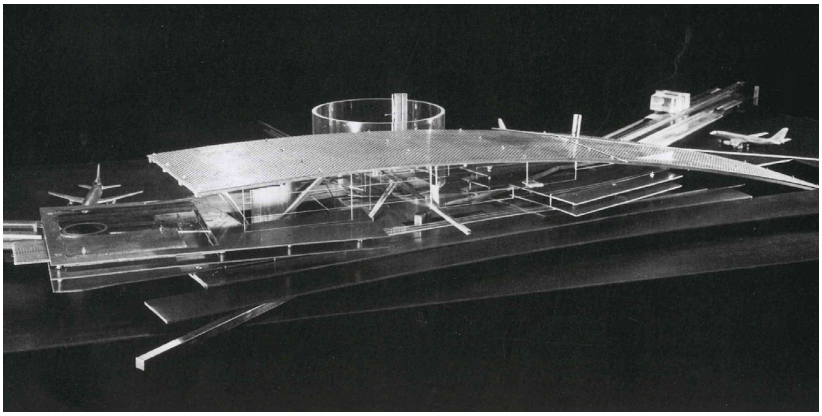
processes that can be done in 3-D - I call it 4-D" (92) (fig 3.7). Moon reinforced this idea by stating that "the model should allow them this freedom of expression, leaving room for the imagination and facilitating creativity" (101). The model has become increasingly active in the integrated design process. Architects are able to physically participate in the design process through the actual action of cutting materials, performing design experiments, and discussions results with colleagues.

Scaled models are impossible to be constructed perfectly real. This seemingly limiting characteristic can actually allow and potentially enhance the experience of the design process through the increased abstraction, space and gaps necessary for imaginative associations during the design process (Moon, 2005, 133). This experience effectively creates the necessary tension between reality and fantasy that drives and stimulate our imagination. The abstraction of the model, or as Moon described as the blurred zone, is where the architect's imagination and experimentation occurs. She described it as "the place of abstract architectural research and artistic self-determination" (Moon, 2005, 103). Some architects deliberately constructed their models in a simplified form, such as Peter Pran's model for the Consolidated American/Northwest Airlines Terminal designed in 1989 for JFK Airport in New York. Moon described these models "as if suspended in space" (96) (fig 3.10). With the intention of isolating the expressions of these pieces to only communicate the poetic essence of the design.

Figure 3.8 (opposite top): Zaha Hadid's study model of Illinois Institute of Technology Campus Center, Chicago, 1998. Card sheets were cut to form simple and incomplete forms provoking interpretations.

Figure 3.9 (opposite): US Federal Courthouse by NBBJ, imaginative gaps exists between different versions of models.

Figure 3.10 (right): Conceptual model for the Consolidated American/Northwest Airlines Terminal at JFK Airport by Peter Pran, 1989. Simple form and material use focuses all attention towards the design concept only, expressing the airport as a continuous roof projecting out of the ground.

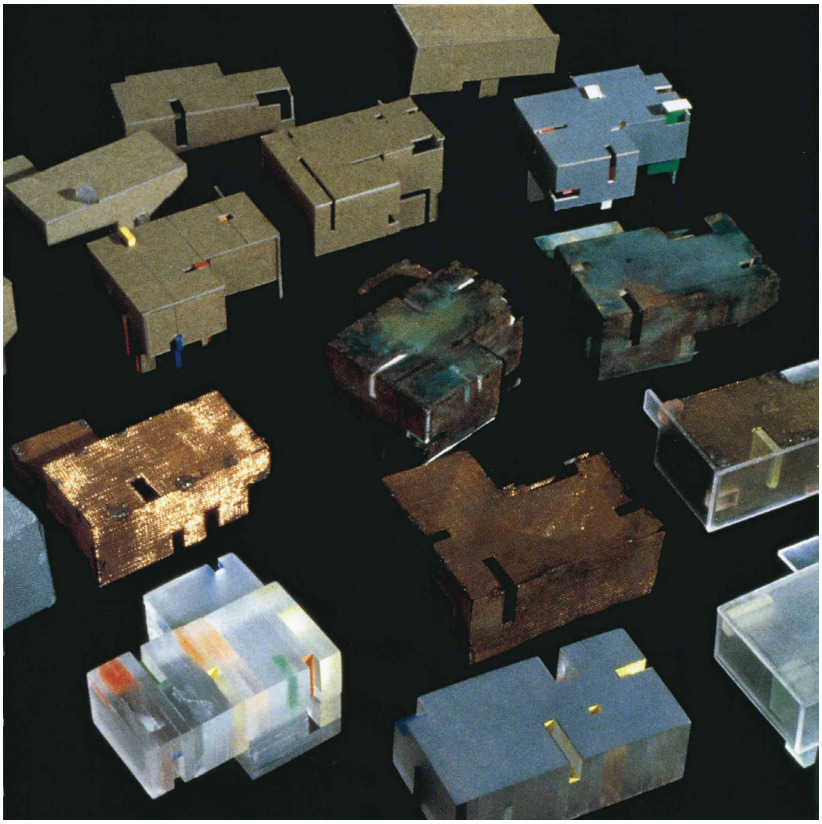


3.5 An essay on play

As babies we opened our eyes and saw the world, we had no idea about all the things we were seeing and experiencing. We did not have the knowledge needed to comprehend and make sense of the things around us. Our brains were not developed enough to understand through language and text. We needed a basic and intuitive method to understand the world. Similar to breathing, play is much like an activity that humans are born with for our brain's basic development and growth. Through play, we are able to develop essential social skills necessary for us to survive as humans, such as language, communication, cognition, and imagination. J. Huizinga believed the concept of play should be "understood here not as a biological phenomenon but as a cultural phenomenon" (Huizinga, 1949). Playing could be one of the first lesson humans will ever have before any official education and will become part of the daily routine for children like work. Yet, as humans grow old and mature, the activity of play slowly becomes less educational and more for relaxation. Play might even become an activity that we deny as we mature into adulthood.

From a biological perspective, play is to be seen as neuroscientist Dr. Jaak Panksepp discovered. By observing mice at play he found that they would emit a particular frequent short burst of sound, in the same time they would express a behavior that was most careless (Abumrad, 2008). In a similar experiment, monkeys behaved most relaxed at play and generated a similar sound pattern to the mice. The sounds generated by the monkeys were considered to most resemble human laughter. Dr. Panksepp believed that laughter is actually a signal of safety (Abumrad, 2008). It is a sound that can only be generated in the state which the psychological level is at its most stress-free. This discovery suggests that the act of play actually ensures a free flow of thoughts within the human mind.

Figure 3.11 (opposite top): Steven Holl's process models for the Sarphatistraat Offices, Amsterdam, Netherlands, 1996-99.



culture of play

Historian Johan Huizinga believed that the act of play is not only a biological response but should be understood as a cultural event. He claimed play always involve “ceremoniousness of attitude and gesture” (Huizinga, 1949, 1). He drew the connection between play and spiritual rituals suggesting they both employed certain guides and requirements, with each step containing specific meanings and symbols. Huizinga described this connection “in myth and ritual the great instinctive forces of civilized life have their origin: law and order, commerce and profit, craft and art, poetry, wisdom and science. All are rooted in the primeval soil of play” (5). This view has strong resemblance to E.H. Gombrich’s description on the ancient perspective on the relationship between the divine, architecture, and humans. While Gombrich saw buildings and dwellings, which are not

very different than art, as the bridging device between humanity and the mystical divine. Huizinga saw the act of play as bridging between knowledge and the divine, to him it was a way to understand the natural environment .

It may seem that play holds enormous power by its close resemblance with characteristics seen in rituals. Play can be seen as a ritual activity because both are established forms of behavior that can be repeated in a prescribed manner (Huizing, 1949, 44) (fig 3.11). The act of play, as an everyday activity, is actually both temporally and spatially extraordinary (Huizinga, 1949,). Play exists beyond the limits of physical and material barriers of things. Children anywhere in the world, even when not given toys or play-things, are able to imagine and dream up mystical events and fantastical creatures to be included in their play. Playing does not require special skills or knowledge, because we are inherently programmed to play. In architecture, we often face real issues in life with scenarios that involve many social and economical problems. Architects sometime regarded their design process to resemble play-like ritual, manipulating various drawings and models as if they are toys. These architectural representations present themselves as sensible substances that mystically interact with both our bodies, minds and the surrounding envrionment. Architects may believe the physical models may hold mystical powers.

Figure 3.12 (above): Boys of the Yao tribe in Malawi participating in their native rituals wearing traditional costumes.

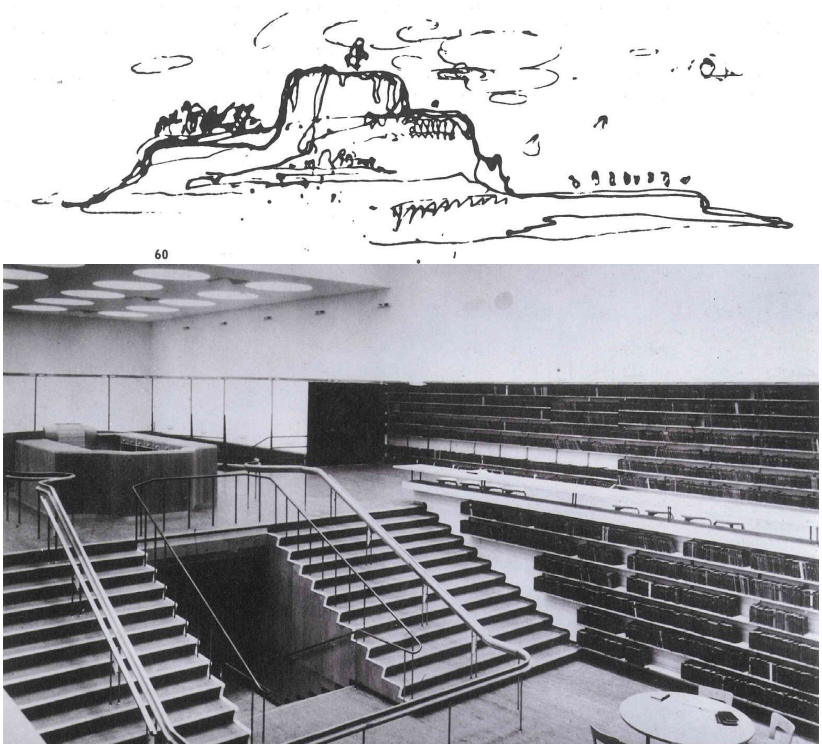
Figure 3.13 (opposite top): Alvar Aalto's concept sketches of the Vyborg Library showing multiple sun positions over a mountain.

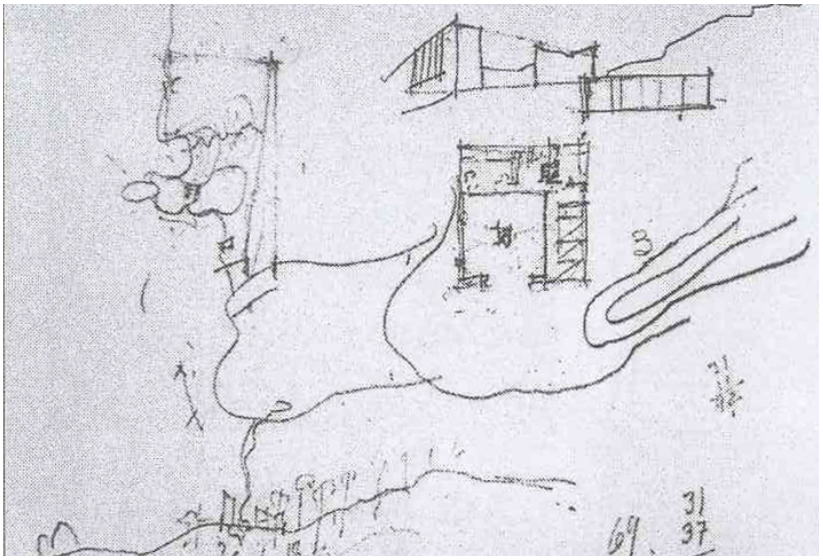
Figure 3.14 (opposite bottom): Interior of the Vyborg Library with multiple platforms and skylights.

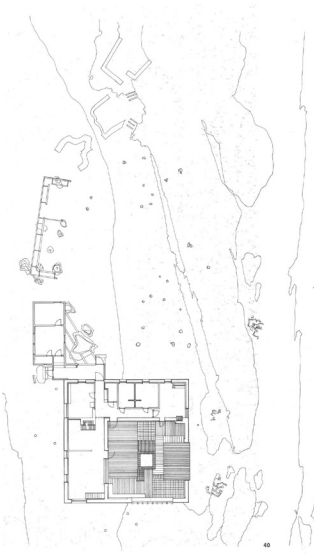
As Smith believed that the architectural models “were ofthen regarded as toys of magic, marvel, and fantasy” (Smith, 2004, 64).

play in design

The concept of play, as an approach to design, was implemented by Alvar Aalto as a inspiring strategy for design. This was confirmed by one of his essay “that he tries to ignore most of the information pertinent to the design and draw almost child-like scribbles; and in another connection, he described his design approach as ‘play’” (Jormakka, 2008, 34). In his design for the city library at Viipuir (now in the city of Vyborg, Russia), he stated that “when I designed the city library at Viipuir […] for long periods of time I pursued the solution with the help of primitive sketches. From some kind of fantastic mountain landscapes with cliffs lit up by suns in different positions I gradually arrived at the concept for the library building” (Wilson, 2000, 34).







Aalto believed that through the process of play, unexpected outcomes and solutions may arise unconsciously. Aalto in designing the Experimental House in Muuratsalo (1953) played with various types of drawings at different scales. He utilized landscape features in miniature for free-form pavilion plans, and even mixed portraits with the site plans (Jormakka, 2008, 35). As mentioned in chapter one, Aalto's intention maybe to create a 'Deus ex Machina' effect through the unpredictable playing process. Architect Josef Frank referred to these unpredictable and surprising processes as 'Accidentism'. He suggested the process "involved the quasi-accidental combination of various images both from high culture and lowbrow kitsch, in order to achieve the kind of vitality that characterizes naturally grown cities" (Jormakka, 2008, 34).

According to Johan Huizinga, play is creativity. It is a free flowing activity and at the same time it is serious. He described "we play and know that we play, so we must be more than merely rational beings, for play is irrational" (Huizinga, 1949, 4). The unconscious construction in play is only possible when play itself is a free process, one that is not bounded but serious. Rules to any play can be set by the individuals who participate in the act of play. We always establish rules for any playing event, no matter how rudimentary these rules are. When a design process is treated as a 'free-play' environment. We must

adhered to the rules of ‘free-play’ by allowing our bodies to intuitively respond to our thoughts, and materialized any imaginations into any objects through the act of making using any methods possible. Within this ‘free-play’ environment, these objects our bodies created can be later manipulated and reviewed, which is essential in transforming these objects into sources of inspiration to later stimulate our thoughts, making this process a repeatable routine.

In contrast to the ‘free-play’ design process, computer programs are only designed with the intension to make the design process more efficient and calculate complex shapes. Therefore, it is inherently rational and the design environment it provided will not be free. Computer programs are often calibrated to the needs of the architect to be used in architecture. Their rules are set by the programmers with the advice from architects based on their experiences, and knowledge on the customs and conventions within architecture. Since these rules are not set by the users themselves, these computer programs are too rational to be treated as ‘free-play’ design process. Every decision is based on the rules set-up by program designers.

All initial design process should focus on ideas and concept development. The design process at this stage can be treated as play,

Figure 3.15 (opposite left): Alvar Aalto sketches of the experimental house in Muuratsalo.

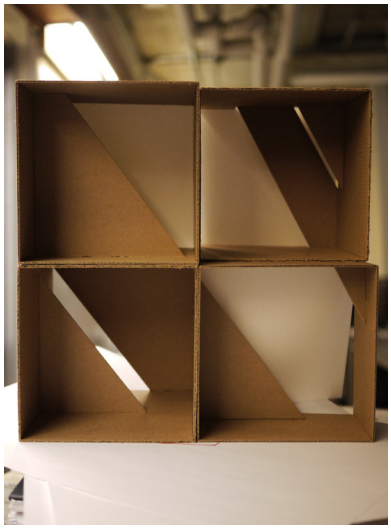
Figure 3.16 (opposite right): Site plan of the experimental house in Muuratsalo.

Figure 3.17 (above): ‘Accidentism’ exbition on the work of Josef Frank in the Stockholm Furniture Fair, 2005.

because architects are not capable of working out everything all at once, nor are they required to solve all problems. Design is to be a intuitive process that is light hearted and flows naturally. It is, in the same time, fun but serious.

exercise of play

The exercise of play, was not intended to produce any machines or objects, but to look into the design process. It was to be a demonstration of free-play in a design process. The whole exercise is to be seen as an operating machine that comprises the physical body of the designer, metaphysical ideas and the physical objects that would be created as a result of the exercise. This exercise was to become an experience through the design process and to stimulate the responses of the body. The exercise was to follow that of a game, with proper guidelines, rules, and boundaries so that the game can commence. These guidelines, in the same time, should lead the flow of the process in fare play. Yet it was understood that these guidelines could potentially be dangerous, as their ambiguous nature may be difficult to justify. The set up of this playing-environment was to first identity a design theme to be used as the ruling principle guiding the exercise. This design exercise was to be an experiment of light quality



under different materials, which in this exercise includes paint, paper, cardboard, and concrete.

First a drawing was done based on an intuitive idea of light, in abstracted geometries. The initial review of this drawing was to look into the light qualities appearing under different color shades and the effects of color on different paper texture. Upon looking at this drawing, on a metaphysical level, revealed an understanding of light as a combination of the composition of artistic intervention that occurred in the brush strokes and the selection of colors reflecting my mental state. In the same time, the drawing as a physical object, reflected the light quality as the result of color pigment applied on textured surfaces.

Adhering to the rules of this playing process, I then turned and looked into other materials in an attempt to recreate a similar lighting quality. The exercise evolved into a three-dimensional paper sculpture that took the form of the initial drawing in color. The drawing was first divided into six squares and were given volumetric dimension by separating the shapes from its single layer and organizing these layers into a cube. This transformed the color drawing into a monochrome and became a recreation of the drawing with color shades through infusing light into the sculpture. Beyond its inherent light quality, each cube

Figure 3.18 (opposite top): Drawing of light in color shades.

Figure 3.19 & 3.20 (opposite): Paper sculpture of light under different lighting variations.

Figure 3.21 (right): Concrete sculpture of light, this is the second piece done with a different concrete mix and fewer openings. .

seems to have obtained its unique spatial character with the layering of shapes and light.

The paper sculpture revealed one important aspect about a ‘free-play’ design process, which was the willingness to venture into the unknown. In the same time, the participant must believe in the fact that unplanned process contains a “Deus ex Machina” effect that could only result in unpredictable outcomes.

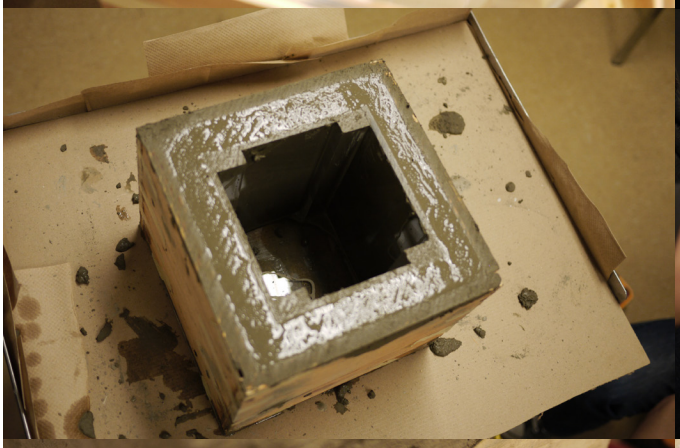
The relationship between light and material is further explored in the final phase of this exercise through an experiment with concrete. The decision to select concrete as the material was based on the close relationship it has with architecture. It is one of the most universal and oldest man-made material available. The exercise on concrete turns out to be the most crucial point in the development of this thesis. The first attempt with the material failed with the sculpture broken in pieces as the form work was being removed. This moment of the exercise became an in-depth learning opportunity to better understand concrete, the material itself, the making of the form work, the planning required in the arranging the form work, the construction of the form work, the mix of the concrete, and the ratio of the mix...etc. It revealed the importance and the beauty for all design process to possess on an trial-and-error attitude that these types of exercises would always yield unexpected opportunities.

The playing process for thesis exercise is an extremely time consuming process, but it seems to be the most productive exercise in comparison to the other two exercises. The playing process requires the momentarily full emergency of the participants, but it can be interrupted at any moment in time allowing the process to be evaluated. The full indulgence of the playing process allowed all attention to be focused on the subject of design, which in this case was to understand the relationship between material and lighting qualities.

Figure 3.2 to 3.29 (opposite): Opposite images in chronological order from left to right, top to bottom, showing sequence of the making of the first concrete scuplture that was broken during the formwork removing process.








Chapter 4:
further dialogs and speculations

the following dialog documented the conversation that took place after the final presentation, the discussion looked into issues surrounding the inter workings of the author during each exercises and explore further into other topics such as the issue of the model, perspectives on beauty, problems with ambiguity. This is to be seen as an extension to the content of this thesis.

-End of presentation and beginning of questions and answers.-

KS: Can you tell us a little about this, we have seen these two.

MY: Well this is the last exercise in play, and it started with a painting which I never done before. I just looked into shades of color and try to make that into an object which is to be related to architecture. At first I looked into simple cardboard models and its light qualities. Then I moved on to more architecturally related materials.

JK: So this is concrete?

MY: Yes, if I have more time, then more materials will be looked into, but I can only do two versions right now.

AS: I will tell you this is an idle-like process and it will take you the rest of your life, but which is why architecture is an interesting field.

My: Yes.

KS: Question, there's two of these, and that you tried different things. Which one did you do first?

MY: This one.

KS: And why is this broken?

MY: The mix and the formwork.

KS: So what does it tell you?

MY: The experiment with different materials needs a lot of testing, and there's always failure in it, but every time you do one, you just keep getting better.

AS: Which is something you don't learn in the digital images and form.

MY: It became something that you actually know how to do it without, I guess, reading it from something, or it becomes part of, or intuitively respond to, how I should pour this concrete, or how to take the form work out, or how much time do I have to wait, it becomes part of process that got hardwired into me.

KS: It is interesting that, the author, I think, he is a musician named Nachmanovitch (Stephen Nachmanovitch), anyway he wrote a book called Free Play (Free play: improvisation in life and art) and he called this the 'joy of mistakes', and I think that is why I m actually trilled that it is broken. I had a colleague once, that's a way to learn about gravity, is to design a space station, the reason for that is when you are absent of something, then it is much more poignant or pointed, or exciting. and so here you know a lot more about concrete, then you did a year ago, just because when you touch it, you see what or how it doesn't work-its failures, then you learn more about its properties, so I think that it's exciting, that one to me with the failure is a lot more exciting, because it means a level of knowledge, and that's the point you are trying to make, it's the joy and discovery which can't happen as much with the computer.

AS: I got a really good question, there's a lot of history on the true and beauty, you covered a whole series of machines, which one is the most beautiful to you, and why?

MY: I think there's actually two, but they are on the opposite scale. In terms of pleasing to the eye, it's obviously the truth machine with its crisp cutting and mechanically pleasing, I would say. But then the one that I actually think is most true to this thesis is the last piece; which I think is not only any one of these pieces. But the whole process to be seen as the machine, with me included in it. And that I think is the beginning of something that can be looked into forever.

KS: Because Through history, Plato talked about imitation; that the artist was just about imitations. So he didn't have a lot of respect for artists because he said that they just imitate. Whereas Socrates started to say there's truth in geometry, proportioning and things like that, through history, unity, clarity, are parts of what it is. So I can understand that, that has precision, but rather that's beauty, is another story, because one could argue that its precision is beauty, but you are arguing it's the process that is beautiful and that's what AI was asking was if truth and beauty was articulated.

JK: There is also the history of attraction to the ruin as beautiful thing. And so your last piece, even though that was not broken, the fact that it is very rough concrete, it has some of the same qualities of a ruin that's texture; the excitement of the texture makes it beautiful.

AS: Yes, I think it makes a connection to the memory, beautiful memory.

KS: And the Japanese pot.

JK: Yes.

KS: That it has to have something that's imperfect to make it perfect. Because it only right if there is that little bit imperfect that makes its human, made by the hand. And so my Turkish carpet is not perfect, but it's beautiful because I know it's made by the hand. So there are a lot of those things that have those qualities and I think the ruin quality is also important.

JK: I have a question for you, through these exercise you documented various techniques that are used in architectural design through modeling and through other media, but do you think there is a problem with the fact that you isolated various types design process of production as a thing that you are looking at, you isolated it from specifically architectural design issues in modeling, because you are looking at modeling, but separated from architectural modeling. And I think that was deliberate.

MY: Yes.

JK: But what were the problems involved with that as a basis for your thesis?

MY: …

JK: That you separated modeling from architectural modeling, like none of this is architecture, not a little model of a building which is what our normal, as architects would model a piece of a building or building and your modeling is much more abstracted than that. So how do you take that abstract conclusion, and apply it to architectural model.

MY: Well, I think the technique of making, is the biggest take away from all these exercises. But I think, also the way how things can be interpreted is also another important part of this series of exercises. Because depending on how you see from different angles and perspectives that each of these can potentially become an architectural space, but just not obvious to the eye. It requires you have to be thinking deeper about what does it mean to you. I think that's how it can be related back to architecture.

JK: I was actually thinking, when we learn about research method, I absolutely applauded to you for doing so much primary researches, most master thesis projects are based on secondary researches. This one is almost entirely based on primary research, which is amazing. That set that aside for a second, when you do primary research you

have to make some decisions and one is do you work in a laboratory which is isolating your problem? Or do you work in the field which is closer to what you are looking at but has so many externals, that is harder to isolate the thing that you are looking at, so there are all these things to get in the way at the thing you are looking at, like if you are modeling the building over and over again in different ways, the problem would be that you are also looking at the building which does isolate what you are looking at, so when you are in a laboratory environment like you are isolating the problem, the problem is can you fully externalize your conclusion robustly to architecture, because you are not doing architecture, you are doing modeling which is a subset of architecture.

MY: This is what I sort of regret for not being able to do an architectural design, but I think to do an architectural project, you have to take into consideration program, sizes, detailing and everything, and that I think it takes away from the level of focus I am able to get from just doing abstracted models. In a sense I can, from my personal views, see these as architecturally related, not as a building, or it is just an object that relate the relation.

JK: I do think that's absolutely true, when you look at the various processes involved and I think that is very exciting. And I think one of the issues with architecture these days exactly is exactly what you are at. But what happens sometimes is we get full buildings that are as realized as they would have been, if say, were fully modeled in all the ways that you would try to model. Like the Crystal or the ROM, is a fine example of something that wasn't looked at with great level of care at model level. They didn't really looked at all the spaces, well enough to result in all the unresolved spaces, that have no tactility and integrity, sort of the things that you are get at.

KS: I am going to touch on the issue of ambiguity, and sort of build a little bit on what June had said. Yes, they are not necessarily architectural models, or models of architecture I should say. They are 'architectural' models, and I differentiate the fact with it's not a model of an architecture, but model of architectural ideas. So the issue with somebody like Renzo Piano workshop, or something like that could see this maybe as a detail. So this maybe mocked up as a detail, I could see spandrel, mocking up his columns or all of these kinds of things. We certainly know Frank Lloyd Wright's full scaled mockups of columns and details. So I think there are those abilities to see a piece of this as being part of the whole. And if we speculate that cardboard thing, it could actually be spaces because I am starting to see light and it becomes very much an architectural bounded space. But I want to ask you, you talked about ambiguity, what are your thoughts about ambiguity with everything you have done in the past year? What are your thoughts, because you talked about ambiguity, so I wonder if you can tell us about that?

MY: that is the most difficult part for the whole year. Because it is hard to justify what I am doing, especially when I am in an architectural school to produce things that are just abstracts and it requires me to become extremely rational in thinking and justifying all the pieces. The ambiguity of all these pieces, I think, for any abstracted model and sculptures is a double edged sword. You can gain a lot, you can see a lot from things in it, you get a lot of inspirations from just looking at a corner of this concrete maybe it can become a building itself, but it is also this same corner that can bring you down, because it is only an object of ideas, it needs much more development to make it into a substantial architectural piece, to give it space, to give it scale, to give it human comfort and that's what I think is most difficult.

KS: I would agree with you, and I would also say thing minds create order. And so ambiguous things we won't cuts so we want to figure out. But the most important thing is the leap for an architect from the ambiguous to the something that becomes architecture. So you are absolutely right.

-End of questions and answers-

speculations

The work done within this thesis is only the beginning of a lengthen invesigation on the design process of architecture. Through studies of my personal methods of design, I was able to have a better connect my body senses with my imagination through the process of making things. I also gained knowledge over material properties and had a better understanding over the operation of the world, both physically and metaphysically. It is in my opinion that architecture is comparable to investment, the more time and effort is injected into the initial stages of the design, the better quality and result the final produced could yeild. Model making is time consuming, but potentially rewarding.

The making of models in the early stages of design, stimulates our thoughts and can better communicate ideas through reviews of these objects. The making of architectural models in practice, could reveal mistakes and faults that were not visible on paper and computer screens. For the model makers, whether they are architects or model makers, the making of models is actually a chance to look closer into the organization and operation of this very universe we live in. It is a way to understand how our bodies work, how objects adhere to physical properties, but most importantly the understanding of our intellectural thinking process, our imagination and its relationship to the world.

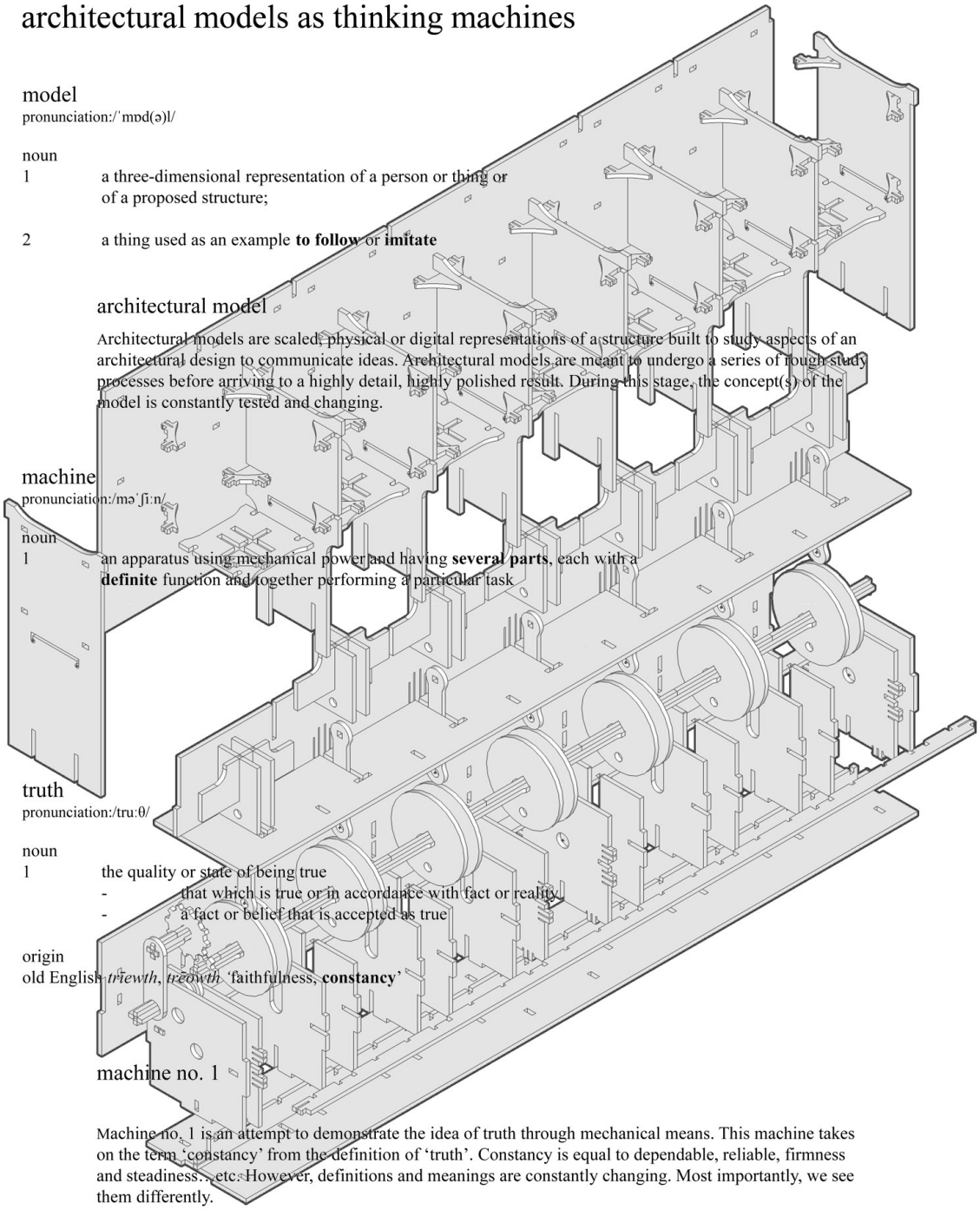
In a profession that is increasingly becoming digital, we as architects, must consider and recogize the limites of the computer that they should remain as tools to our commend. Design opportunities are provided by physical objects that we sense and experience everyday.

Appendix A:

presentation images

All images included in the appendix sections are progress work and intermediate images prepared for earlier presentations within the thesis year. Images in this section, include scanned images from sketch books and presentation posters. Final images of the exercises were presented during the final presentation, they can also be seen within the content of this book. The following images are to provide an overall impression and understanding to the design work and processes.

architectural models as thinking machines



model

pronunciation:/ˈmɒd(ə)l/

noun

1 a three-dimensional representation of a person or thing or of a proposed structure;

2 a thing used as an example **to follow** or **imitate**

architectural model

Architectural models are scaled, physical or digital representations of a structure built to study aspects of an architectural design to communicate ideas. Architectural models are meant to undergo a series of rough study processes before arriving to a highly detail, highly polished result. During this stage, the concept(s) of the model is constantly tested and changing.

machine

pronunciation:/məˈʃiːn/

noun

1 an apparatus using mechanical power and having **several parts**, each with a **definite** function and together performing a particular task

truth

pronunciation:/truːθ/

noun

1 the quality or state of being true
- that which is true or in accordance with fact or reality
- a fact or belief that is accepted as true

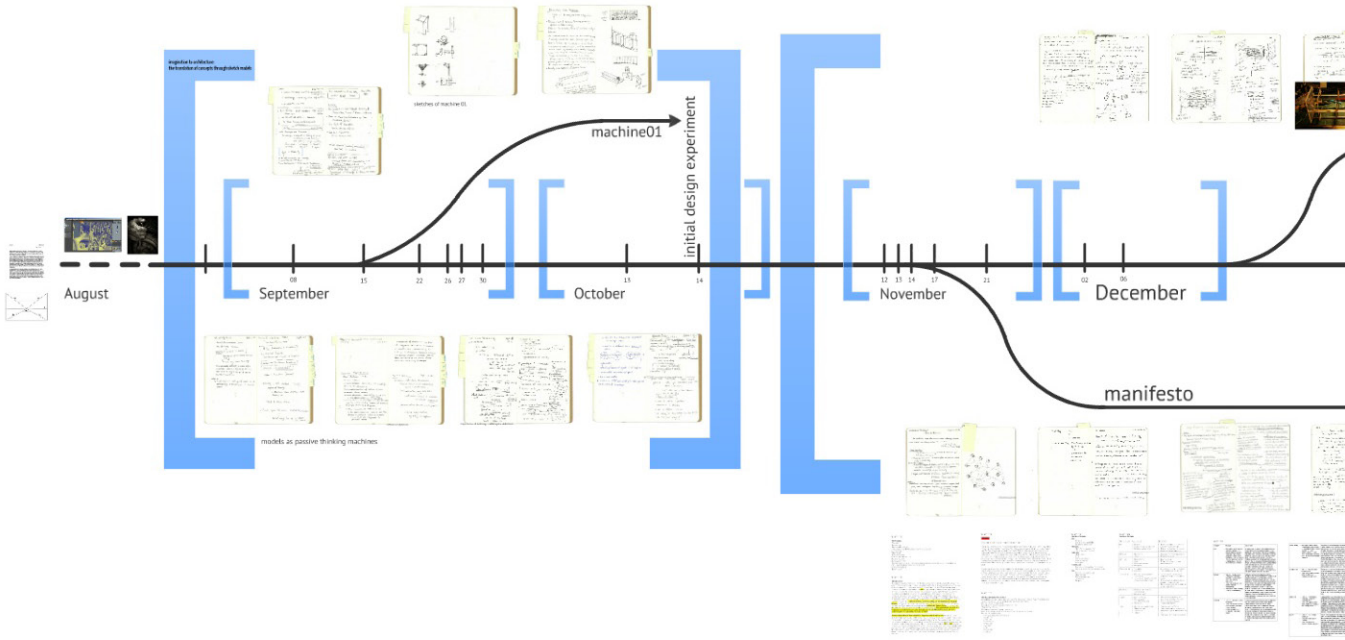
origin

old English *trīewth*, *trēowth* 'faithfulness, **constancy**'

machine no. 1

Machine no. 1 is an attempt to demonstrate the idea of truth through mechanical means. This machine takes on the term 'constancy' from the definition of 'truth'. Constancy is equal to dependable, reliable, firmness and steadiness…etc. However, definitions and meanings are constantly changing. Most importantly, we see them differently.

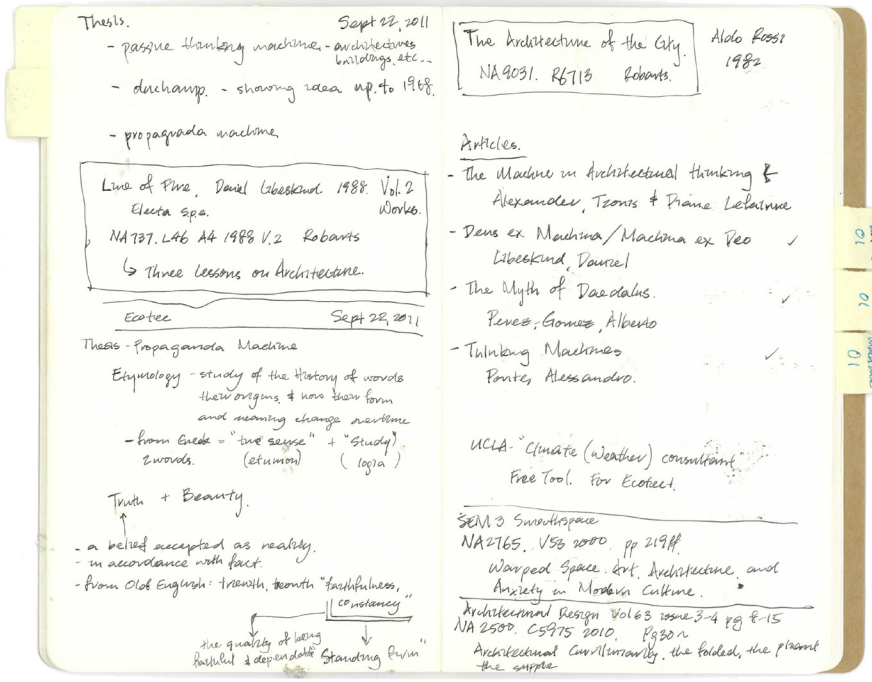
The machine showcases the analogy that knowledge is an accumulation of combinations generated base on previous truths. It is constantly being tested, and is constantly changing. The discovery of new truths can be unpredictable, and we could encounter them by chance.

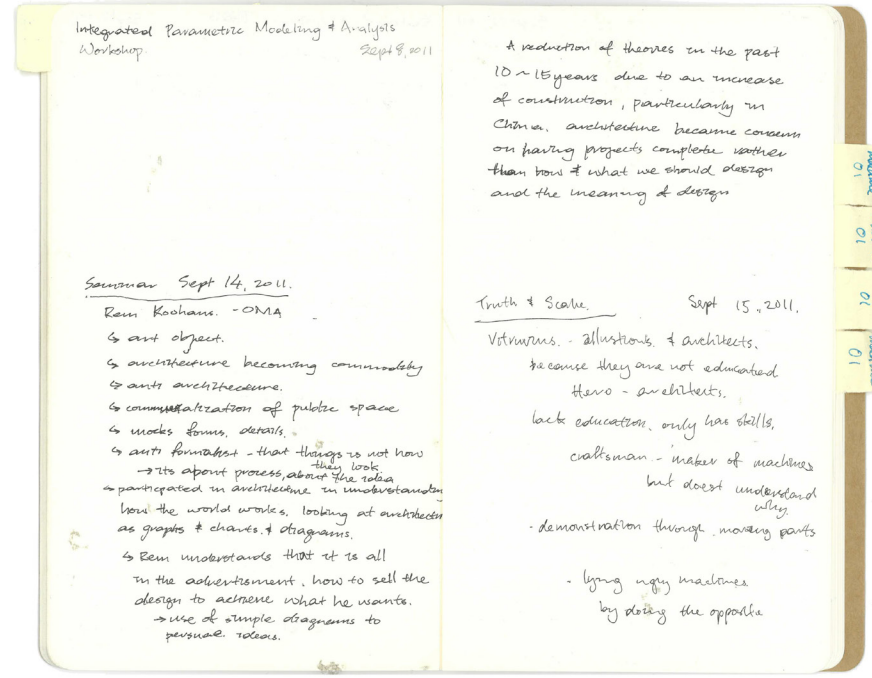

August
September
October
November
December
machine01
initial design experiment
manifesto
models as passive thinking machines

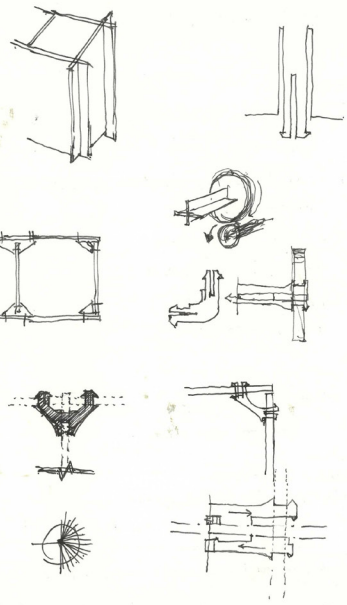

machine03
machine02
research report
substantial review
January
Feburary
March
April

Appendix B:

sketches and notes for the ‘Truth Machine’





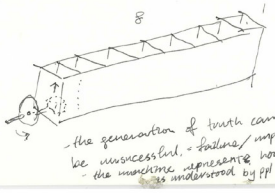


machine 01

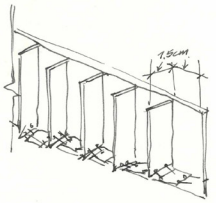
machine 01

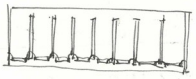
Preliminary Truth Machine

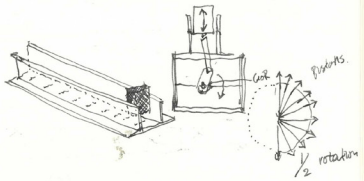
- Truth vs Beauty ← more subjective
  ↑
- follows a set of patterns (can be common) relative to ~~data~~ reality.
- base on the building blocks of previous truths/ patterns
- the machine can be seen as the embodiment of reality. and the blocks (states) represents known truths, as the blocks are shuffled, unexpected combination will be assembled where these represents new truths/knowledge which one base on previous/ known truths.
- truths as constancy, in this I see it as represented by the blocks where their shape/ geometry does not change as new combination of truths are randomly made.
- Beauty is a depiction of known truths.



- the generation of truth can be unsuccessful. = failure/ unpredictable
- the machine represents how truth is understood by ppl at this point



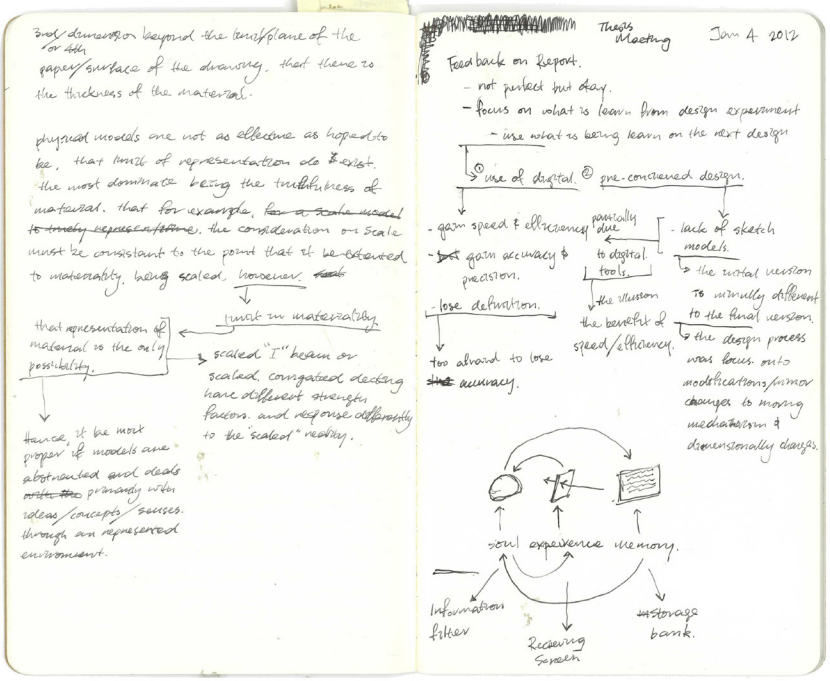


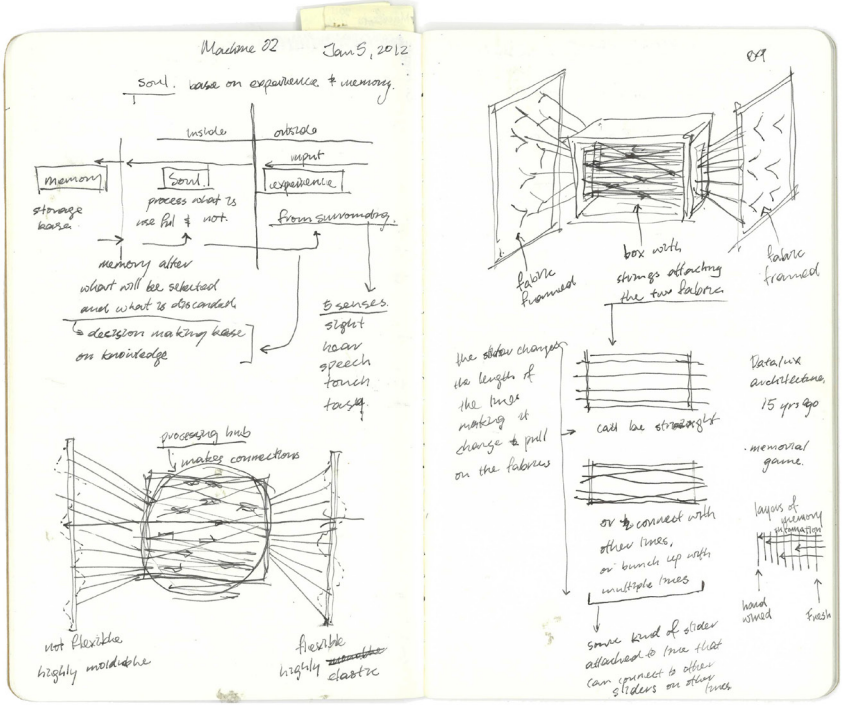


machine 01

Appendix C:

sketches and notes for the ‘Memory Machine’





Report Feedback. - Meeting Jan 5, 2012

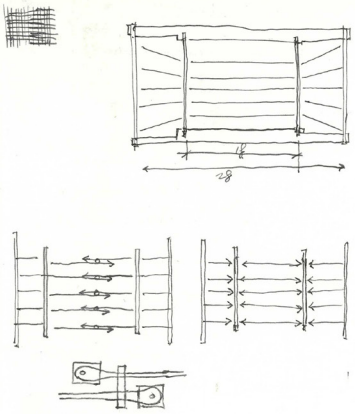
- little more representation.
- make sure hermeneutic is solid.

-problem. - more background on representation
- illusion - perspective expand.
- allusion - play expand.
- types of model.

- define machine.

architecture representation → (guess) architecture thinking machine.

explain.



What is the measurement of soul?

- qualitative
- quality.

How is this applied? What is the system to measure the soul/experience?

- see through the intention ← a personal standard/reference manifestos.
- decisions made by creator/architect/designer → judged by others/users.

Soul/Soulless
↳ to understand something, its best to first understand its opposite and reveal the relationship between the two.

Subject & Object of a building are all elements to measuring soul of a bldg

- intention → ie: memorial is intended for remembrance
- function → the performance of the building's function ie: house to shelter ppl.

Greece Book 2012.02.16

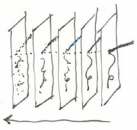
① Reflection Paper
Themed Essay: change from 500 words. to ranges from 1000 → 1500 words.

② Book format: 7"x7", or 8"x10"
↳ size of choice

For next week/meeting.
- Paragraph for site
- map for site

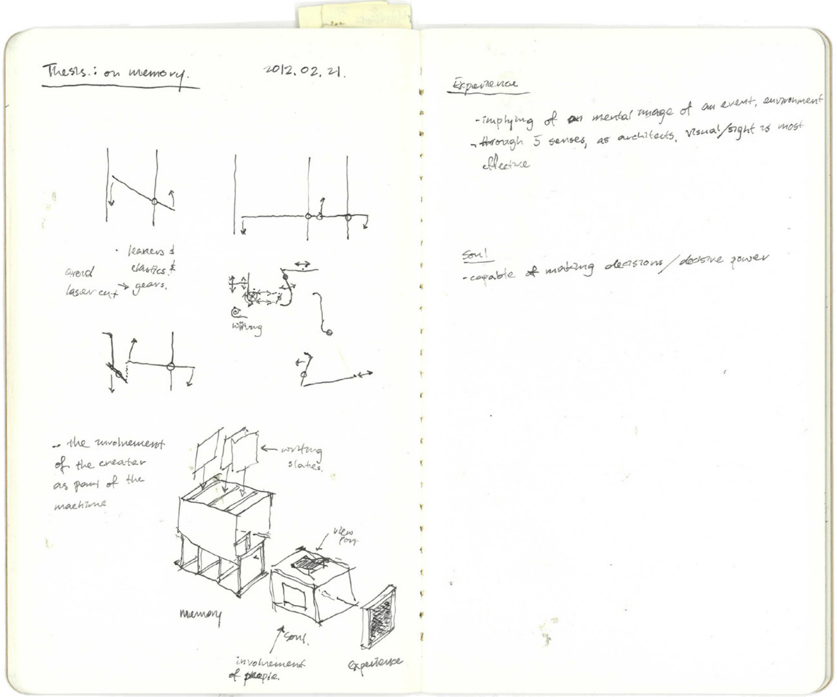
Thesis 2012.02.21

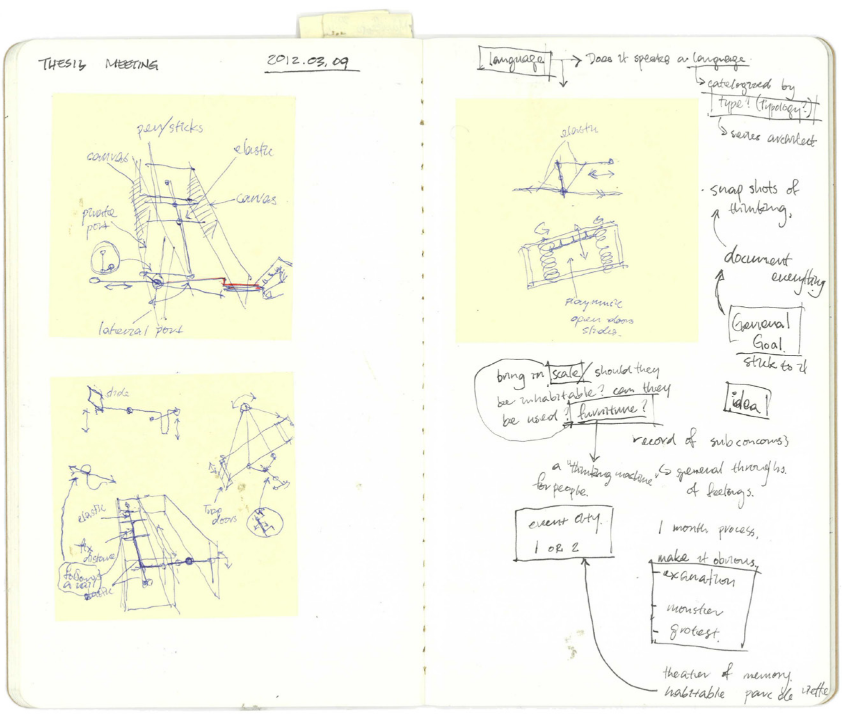
memory

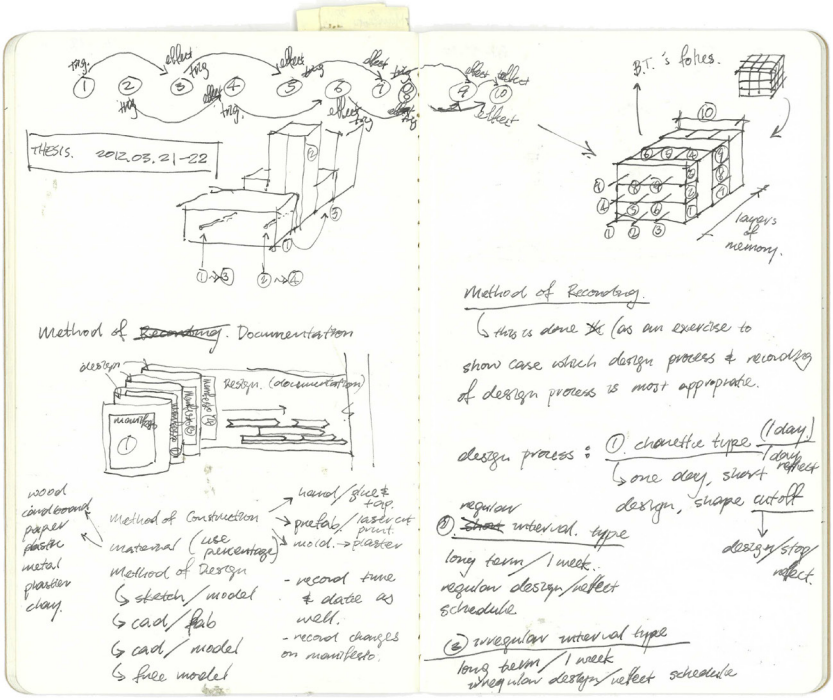


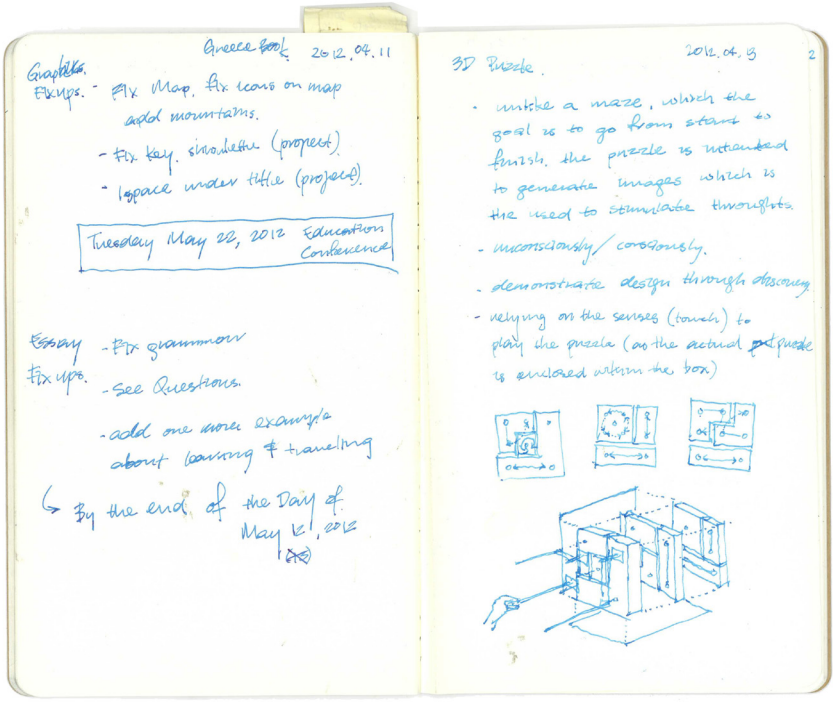
- the further an image is imprinted, (time) the blur-er the image will be, but the better it can trigger the image

- input of memory, is like writing down notes.
- whether you remember or not depends on how far you can write into the subconscious
- @ the subconscious level, only fragments remain.


Thesis: on memory.
2012. 02. 21.
avoid laser cut
levers & elastics & gears.
wiring
-- the involvement of the creater as part of the machine
writing slates.
memory
soul.
involvement of people.
Experience
- implying of mental image of an event, environment
- through 5 senses, as architects, visual/sight is most effective
Soul
- capable of making decisions / decisive power

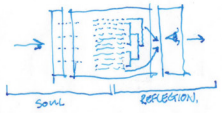

THESIS MEETING
2012.03.09
pen/sticks
elastic
canvas
pivotal post
lateral post
elastic
language
Does it speaks a language
categorized by type? (Typology?)
serves architect
snap shots of thinking.
document everything
General Goal.
stick to it
idea
bring in scale/ should they be inhabitable? can they be used? furniture?
record of subconcious)
a "thinking machine" for people
general thoughts of feelings.
event day. 1 OR 2
1 month process.
make it obvious.
exageration
monster
grotest.
theater of memory
habitable


THESIS. 2012.03.21-22
B.T.'s folios.
layers of memory.
Method of Recording.
this is done (as an exercise to show case which design process & recording of design process is most appropriate.
design process : ① charrette type (1 day)
one day, short design, shape cutoff
day reflect
design/step reflect
regular interval. type
long term / 1 week
regular design/reflect schedule
② irregular interval type
long term / 1 week
irregular design/reflect schedule
Method of Documentation
design
design. (documentation)
mountain
wood cardboard paper plaster metal plaster clay
Method of Construction
material (use percentage)
Method of Design
sketch/model
cad/fab
cad/model
free model
hand/glue & tap.
prefab/laser cut print. mold. → plaster
- record time & date as well.
- record changes on manifesto.


Greece Book 2012.04.11
Graphics
Fix ups. - Fix Map. fix icons on map add mountains.
- fix key. simplify (project)
- legend under title (project).
Tuesday May 22, 2012 Education Conference
Essay - Fix grammar
Fix ups. - See Questions.
- add one more example about learning & traveling
↳ By the end of the Day of May 15, 2012
3D Puzzle. 2012.04.13 2
- unlike a maze, which the goal is to go from start to finish. the puzzle is intended to generate images which is the used to stimulate thoughts.
- unconsciously/consciously.
- demonstrate design through discovery
- relying on the senses (touch) to play the puzzle (as the actual puzzle is enclosed within the box)

Machine 03 : Memory Puzzle

aim. - to demonstrate the concept of memory.
- to demonstrate how memory can be accessed.
- to demonstrate the relationship subconsciousness and memory
- 3 part.: decision / storage / image.



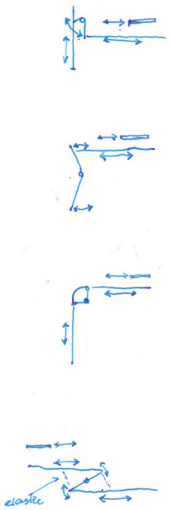
Type 1. Mechanical (simple machines)

Type 2. Puzzle (Blind Puzzle)

→ open and closes a series of doors in order to reveal an image in the back.

→ Blindly rotate / slide a series of blocks in order to complete a variety of images. which is [illegible] in the back.

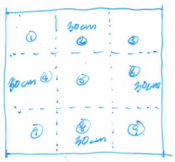
Type 1.



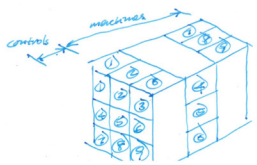
Fra

Frame. (the ~~Frame~~ limit of the work).
in a sense setting when to start and end as well as how wide the boundary is.

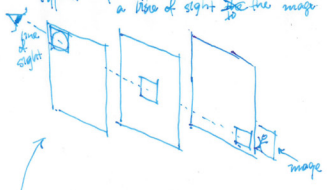
The machine will have 9 set of either simple machines and 9 set of puzzle blocks.



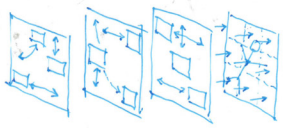
Each set will correspond to a section where the controls are located & then is where the decisions are made by the users.

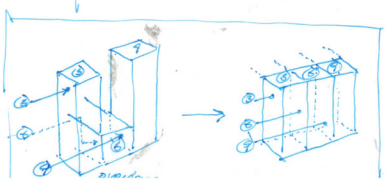


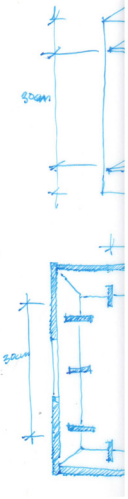
Type 1 opening trap doors to ~~reveal~~ open a piece of sight ~~to~~ the image

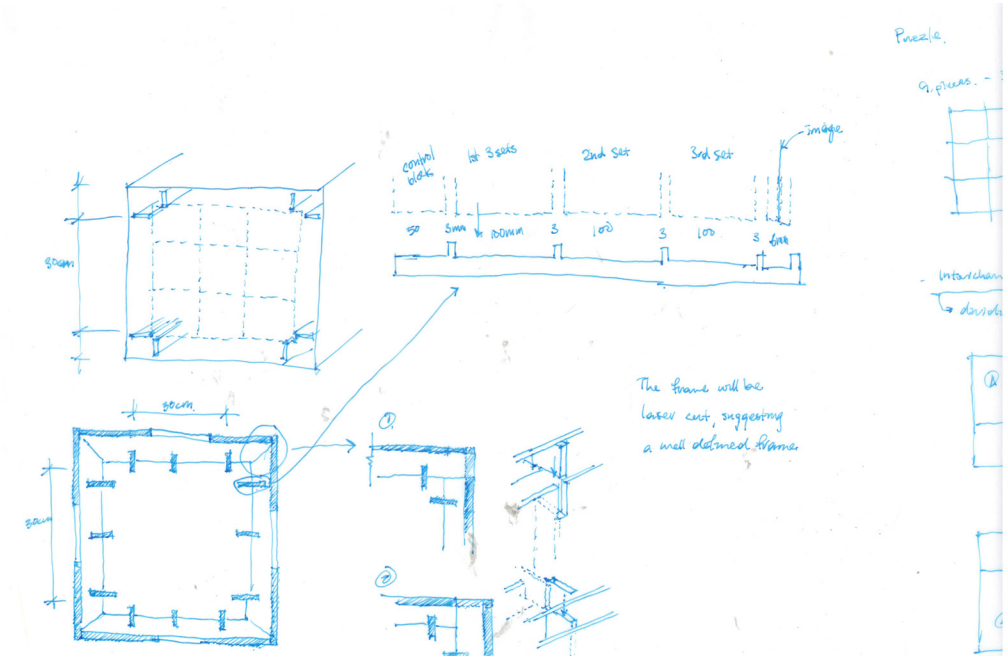


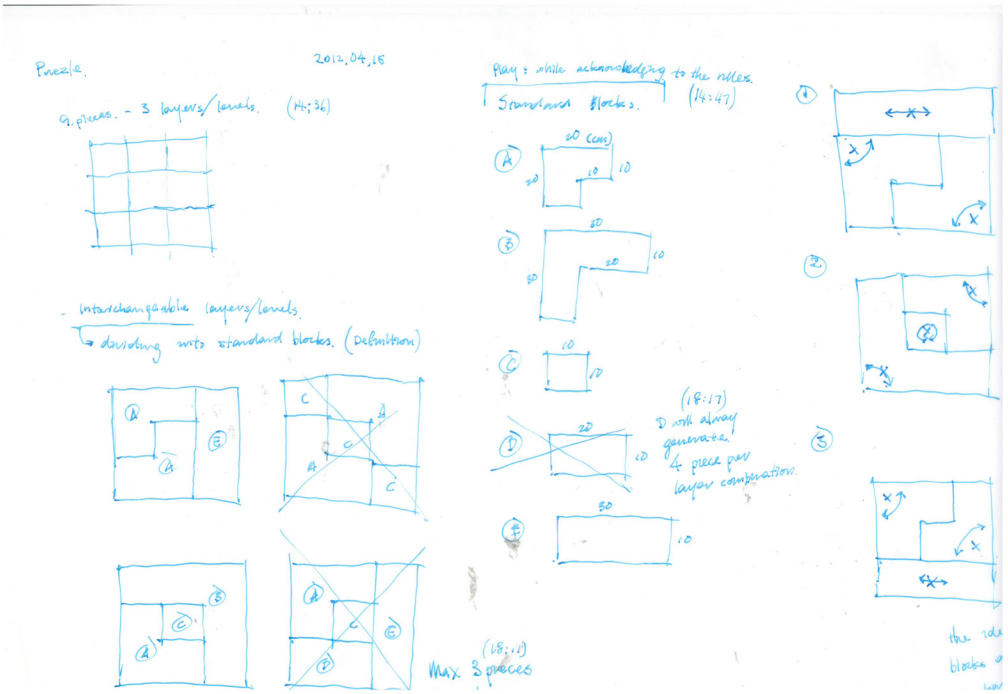
Type 2 blindly sliding & rotating to combine into an image.








Puzzle.
control block
1st 3 sets
2nd Set
3rd Set
image
50
5mm
100mm
3
100
3
100
3
time
30cm
30cm
The frame will be laser cut, suggesting a well defined frame.


Puzzle.
2012.04.15
9 pieces. - 3 layers/levels. (14:36)
- interchangeable layers/levels
→ dividing into standard blocks. (Definition)
Play : while acknowledging to the rules.
Standard Blocks. (14:47)
20 (cm)
10
(18:17)
D will always generate 4 piece per layer combination.
Max. 3 pieces (18:11)

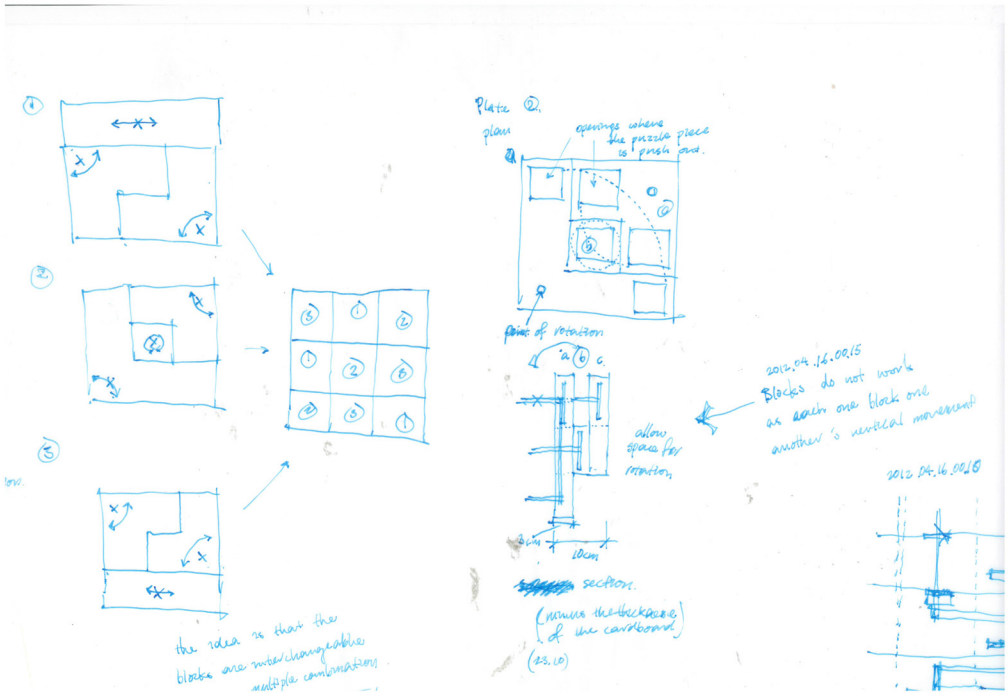
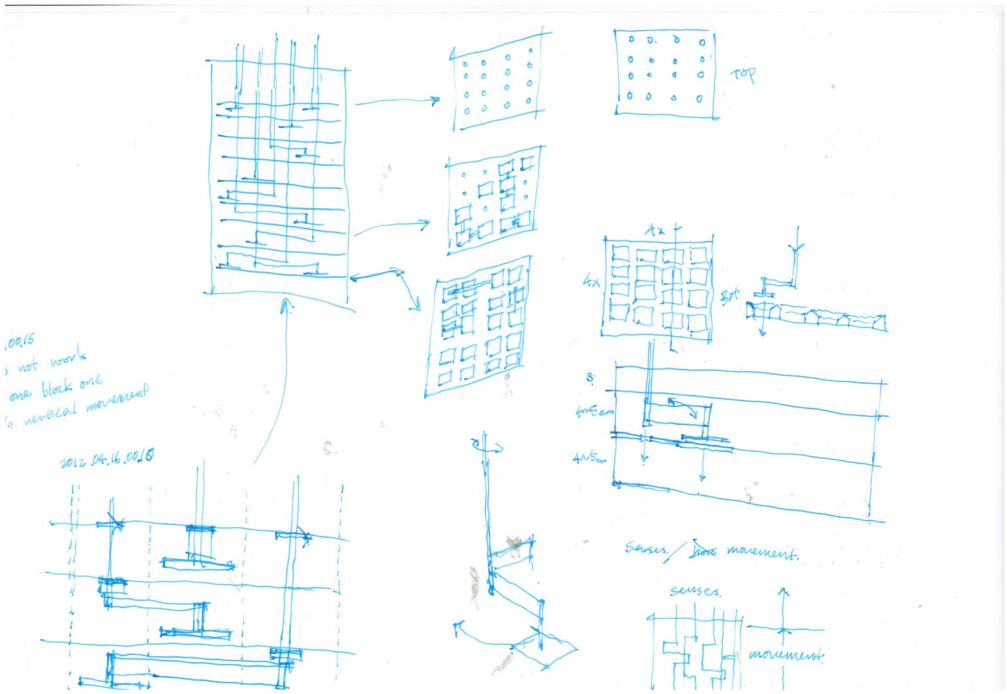


Plate ②
plan
openings where the puzzle piece is pushed out.
axis of rotation
allow space for motion
2012.04.16.0018
Blocks do not work as well in one block one another's vertical movement
section.
(minus the thickness of the cardboard)
(23.10)
the idea is that the blocks are interchangeable multiple combinations


top
2012.04.16.0018
sensor / movement.
sensor
movement

References

Abumrad, J. & Krulwich, R. (Narrators). (2007, May 7). Who am I? [Audio podcast]. Retrieved from http://www.radiolab.org/2007/may/07/

Abumrad, J. & Krulwich, R. (Narrators). (2007, Jun 7). Memory and forgetting. [Audio podcast]. Retrieved from http://www.radiolab.org/2007/jun/07/

Abumrad, J. & Krulwich, R. (Narrators). (2008, Feb 25). Laughter. [Audio podcast]. Retrieved from http://www.radiolab.org/2008/feb/25/

Allen, S. (1998). Terminal velocities: the computer in the design studio. In John Beckmann (Ed.), The virtual dimension: architecture, representation, and crash culture (pp.

Allen, S. (2009). Practice: architecture, technique + representation. London and New York: Routledge.

Burzard, J. (2002). The Grand Tour and after (1660-1840). In Peter Hulme and Tim Youngs (Eds.), The Cambridge companion to travel writing (pp. 37-52). Cambridge: Cambridge University Press.

El-Bizri, N. (2007). Imagination and architectural representations. In Marco Frascari, Jonathan Hale and Bradley Starkey (Eds.), From models to drawings (pp. 34-42). London and New York: Routledge.

Frascari, M. (2011). Eleven exercises in the art of architectural drawing: slow food for the architect's imagination. Abingdon, Oxon and New York: Routledge.

Gombrich, E.H. (1985). The story of art, 14th ed. Englewood Cliffs, NJ: Prentice-Hall Inc.

Hans, J.S. (1980). Hermeneutics, play and deconstruction. Philosophy Today, 24, 299-317.

Holl, S. (2006). Questions of perception: phenomenology of architecture. San Franciso, CA: William Stout Publishers.

Huizinga, J. (1949). Homo ludens: a study of the play-element in culture. London, Boston and Henley: Routledge & Kegan Paul Ltd.

Jormakka, K. (2008). Basic design methods. Basel: Birkhauser.

Kalay, Y.E. (2004). Architecture's new media: principles, theories, and methods of computer-aided design. Cambridge, Mass.: MIT Press.

Libeskind, D. (1988). Line of fire. Milan, Electa.

Marcus, G.F. (2008). Kluge: the haphazard construction of the human mind. Boston: Houghton Mifflin.

McGray, D. (2010). Design within reach: a blind architect relearns his craft. Retrieved from http://www.theatlantic.com/magazine/archive/2010/10/design-within-reach/308220/

Moon, K. (2005). Modeling messages: the architect and the model. New York: Monacelli Press.

Pallasmaa, J. (2008). The dance of construction. In Brian MacKay-Lyons and Peter Buchanan [et al.] (Eds.), Ghost: building an architectural vision (pp.142-155). New York: Princeton Architectural Press.

Pallasmaa, J. (2009). The thinking hand: existential and embodied wisdom in architecture. Chichester, U.K.: Wiley.

Pallasmaa, J. (2011). The embodied image: imagination and imagery in architecture. Chichester, U.K.: John Wiley & Sons Inc.

Porter, T. (1997). The architect's eye: visualization and depiction of space in architecture. London and New York: E & FN Spon.

Sharr, A. (2007). Heidegger for architects. London and New York: Routledge.

Smith, A.C. (2004). Architectural model as machine: a new view of models from antiquity to the present day. Boston: Elsevier.

Smith, A.C. and Smith, K.S. (2011). The architect as magician. The journal of architecture, 16, 5, 765-783.

Stevenson, A. (2010). Oxford Dictionary of English. (3rd ed.). Oxford University Press.

Tanizaki, J. (1977). In praise of shadows. Thomas J. Harper and Edward G. Seidensticker (Trans.). Stone Creek, CT: Leete's Island Books, Inc.

Vitruvius Pollio. (1960). Vitruvius: the ten books on architecture. Morris Hicky Morgan (Trans.). New York, NY: Dover Publications.

Wilson, C. St. J. (2000). Architectural reflections: studies in the philosophy and practice of architecture. Manchester: Manchester University Press.

Yates, F. A. (1966). The art of memory. Chicago: University of Chicago Press.