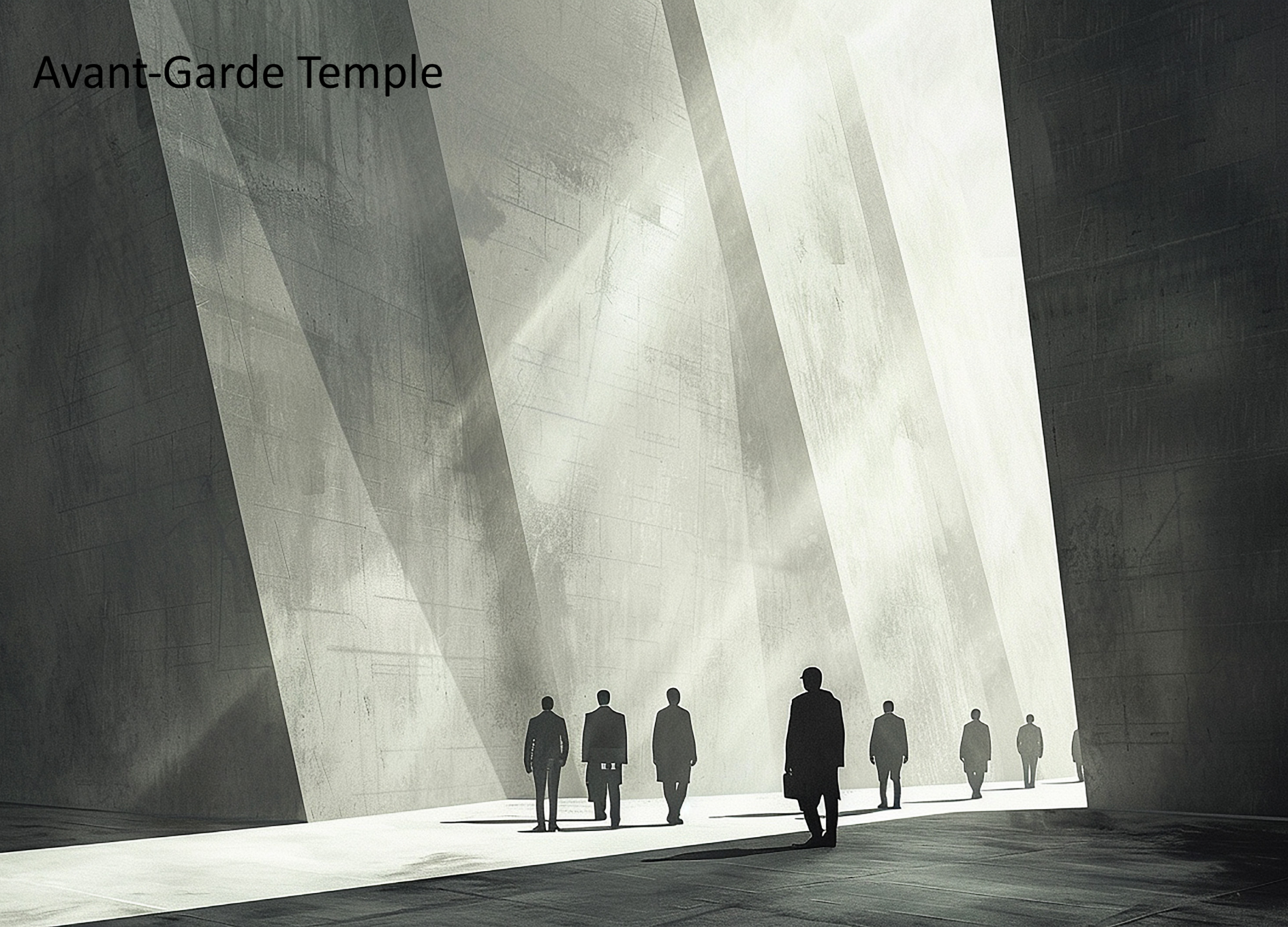


Avant-Garde Temple





LUNDS UNIVERSITET

Avant-Garde Temple
AAHM10: Degree Project in Architecture 2024

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Abstract

The 21st century is the pick of technological achievements, vividly advancing and integrating with our daily lives. Things that were considered very futuristic even at the beginning of this century are now in use by people. Perhaps one of the most distinctive and futuristic technologies that were invented and developed is artificial intelligence. Of course, its foundation goes to the year 1956 but it was widely known and used by people in recent years. The potential and opportunities brought by AI are realized in the market and despite being new for many people, it is integrating with the market fast. As architects, we are responsible for designing spaces suited to our purposes and we should not bind ourselves solely to old techniques we need to update ourselves to be able to optimize spatial qualities and keep ourselves up to date. The purpose of this thesis is to explore and have a series of experiences with AI, an image-generating AI called “Midjourney”, and in doing so, we could better understand its advantages and disadvantages, and how it can contribute to our profession- architects.

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Introduction

“Technology” This word is one of the most fascinating words in our dictionary. During different timelines, it had several understandings in pop culture and people perceived it differently in each timeline. In the movie *Metropolis* (1927) Technology meant gigantic machines that enslave the labor force to work for the upper class which placed in 2026, whereas in the movie *Back to the Future II* (1989) the hoverboards and flying cars, holograms and different fashion were the signs and glances of the future that referred to 2015. Of course, those movies were advertising and showing the future through different political impressions of their time, but they were the signs of people’s real thoughts about the future. Technology is advancing at a significant speed and catching and monitoring it to the population is an uneasy task. People are getting more worried about AI every year as they are becoming more aware of it, according to Artificial Intelligence Index Report 2024, 66% of the participants in 2023 believe that AI will change their lives in the near future, and 52% feel nervous about it. While in 2022 when it was not as popular as in 2023, only 39% felt nervous. This shows the pessimistic feeling of the future from people with respect to the technology of AI. The question is, is AI and technology really taking our jobs and affecting us as significantly as it is shown in the movies and games or is this another hoverboard?

Of course, our world and societies are more complex than the world of a movie, and generalizing an answer for all professions is not the right approach. Even so, the technology and knowledge themselves aid us in predicting the future.

The knowledge and experiences we gain from history and politics clearly show us, that people are getting more and more dependent on electrical and technological devices, since there is a massive population and need, there is a great investment in technology and its advancement and as this need is growing with everyday pass, people and corporations who invest on technology gain more and more power. As a result, that dystopic belief is partially true if only we do not seek new ways. The approach of this thesis is not a discussion of how the world would be dystopic with AI, but an alternative solution on how we can collaborate with it pragmatically. As an architect, I believe our responsibility and profession are not just limited to just building buildings but rather designing space.

When we, as humans, are born, we open our eyes to certain spaces regardless of our geographical location. We continue to live our lives, having sequences of time and space that shape our memory until we pass away. So, space plays a significant role in our lives, and it is inseparable from us. Unfortunately, because of the construction marketing which holds the most capital in architecture marketing, architects are focused mainly on how to optimize buildings’ cost and their appearance on facades. This comes from the capitalism of our era. Our cities have been filled with buildings that are supposed to keep the capital trading and make the city look like each other rather than being space for people (Diaz,2024)(Shrivastava,2023). If architecture stays on its existing ground of construction marketing, it leads us to the point that architects are just solution finders for optimization.

Artificial intelligence does have access to all the resources we have put into its database, and most of the solutions one might find could have been found by someone else. Since one can't remember all this knowledge and is not capable of using them at the same time, makes AI way much more reliable than humans in finding regular solutions for certain problems that have been answered before because of their database, capability of using, and being time efficient. Of course, it does not mean that all architects will be out of service, but we will face a great amount of unemployment in the market.

As it has been said, architects can choose to be optimizers, but our profession is far from that. As space crafters/designers, we are responsible for both our people and surroundings and we should design according to a certain theory. This thesis's main aim and objective is to explore this technology as it is very new to see in what ways it can contribute to design process, currently we know that it does a very good job when we use it as an optimizer and when we need an instant solution for certain problems(if those problems were solved before but we are not aware of them). In order to see how it can contribute to design, a project with an architectural process that composes philosophy, aesthetics, form, and mathematics is going to be designed. We should keep in mind that, even though the outcome of the project is important, the process carries more weight as the aim is the experiment between architect and AI not building a building. Before getting to the project at first the AI 'Midjourney' used in this thesis is going to be demonstrated and certain ex-

periments that could make us understand its language and the way of communication, then, the first part of the project which is about the philosophy of how this project should be made in the first place and the reason behind it is to obtain the first atmosphere and first prompts for developments for AI to aid us in the further steps are going to be explained, and the process that composes of the experiment itself and aims to explore the potentials of AI in different fields and perspectives, and at the end the project, the outcome will be displayed in graphical language.

A new language



In this chapter, The dialog and learning process of AI, Midjourney, will be explained. Like every other program, Midjourney has its language and a way to communicate. The first thing we should know is that Midjourney, besides having a channel in Discord, is a bot that can be added to any Discord server, and like any other bot it gets triggered with certain keys on the keyboard. The way that we can communicate with the Midjourney bot is by writing a “prompt”. In literal it means a short text phrase that the Midjourney bot interprets to produce an image but in reality, there is more to it. Before getting any imagery from Midjourney, by writing the prompt: “/setting” we can access the setting of Midjourney and adjust the setting based on our wish. At the time that this research was started, the default model of Midjourney was V5 but in the end, they changed it to V6. At this point we do have the possibility to RAW mode, choose our style detail, choose our produces to be public or stealth (depending on the subscription. Stealth mode is only available for pro and mega plans), high/low variation mode, sticky style, turbo mode, fast/relax mode, and rest setting. Now, since we have a dwarf knowledge of what options we have in Midjourney we can start producing imagery and test all these options to see what results they would give. By writing “/imagine” we can trigger the bot to start producing 4 images of different variations in response to our prompt. So regardless of what our prompt is Midjourney generates four different images with the option to vary in reference to one of them or scale one of the results up. Before the tests begin, it is important to know that Midjourney is not an architectural tool and it can generate images



based on any prompt given to it. For my first prompt, I wanted to develop a dark atmosphere inspired by the MIT chapel, that share a calm and relaxing atmosphere for student of MIT with the distinct light condition coming from its roof and filtered with certain reflective accessories, and some of its features.

Prompt NO1: *a chapel with a dark environment with shallow lights of reflection from water, made out of bricks similar to MIT chapel, in style of Eero Saarinen.*

Since I did not indicate that I wanted a view from the interior, Midjourney perceived the prompt as an exterior view and gave results as such. The generated view has a dark atmosphere as it was written. Since I did not indicate that I wanted a view from the interior, Midjourney perceived the prompt as an exterior view and gave results as such. The generated view has a dark atmosphere as it was written, and the photo is realistic. As I wanted a view from the interior, I wrote the prompt as such:

Prompt NO2: *interior of a chapel with a dark environment with shallow lights of reflection from water, made out of bricks similar to MIT chapel, in style of Eero Saarinen.*

Since the generated images were in good style and atmosphere and there was some variety between NO2.1, NO2.3, and NO2.4 I decided to generate extra pictures based on those Images:

NO2.1: *interior of a chapel with a dark environment with shallow lights of reflection from water, made out of bricks similar to MIT chapel, in style of Eero Saarinen. - Variations (Strong)*

NO2.3: *interior of a chapel with a dark environment with shallow lights of reflection from water, made out of bricks similar to MIT chapel, in style of Eero Saarinen. - Variations (Strong)*

NO2.4: *interior of a chapel with a dark environment with shallow lights of reflection from water, made out of bricks similar to MIT chapel, in style of Eero Saarinen. - Variations (Strong)*

The prompt for all the generated images for NO2.1, NO2.3, and NO2.4 are all the same, the only difference is that they do have different base images. Even though they share the same properties in terms of atmosphere, style, and dimension, the buildings' shapes are rooted in their base image thus they are different from one another.



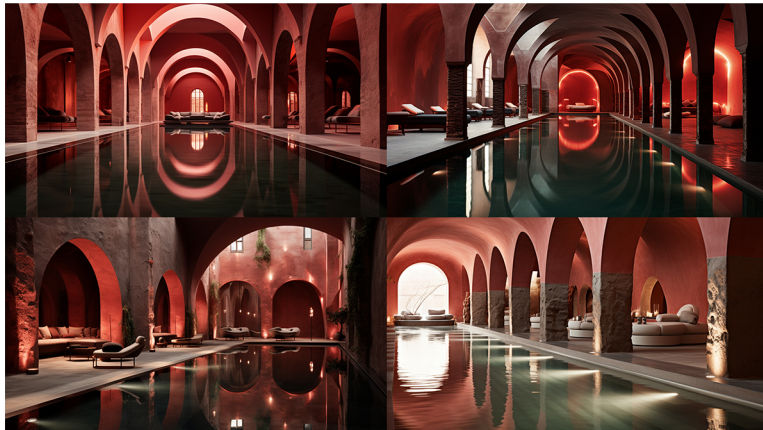
2.4



3

Since the style and controlling details are sometimes crucial for controlling the atmosphere, finding a way to control them is key to determining the abstraction level of the image. Fortunately, there is a great way that we can play with the details. Even though it is in the category of style, in my opinion, it determines the abstraction level from minimalism to realism. The way we can apply our control is by writing "--s" ("s stands for style) and after s and space write a value between 1-1000 where 1 is most minimalism and 1000 is the maximum for realism. There is also another control comment that can determine the size of the image. By writing "--ar" which ar stands for aspect ratio, we can adjust the size of our output image.

Prompt NO3: *an indoor pool with arch bridge by hotel, in the style of medieval inspiration, light red and dark aquamarine, contemporary archaeological, naturalistic lighting, piles/stacks, romaneseque, urban minimalism --ar 16:9 --s 50*



4

Prompt NO4: *an indoor pool with arch bridge by hotel, in the style of medieval inspiration, light red and dark aquamarine, contemporary archaeological, naturalistic lighting, piles/stacks, romaneseque, urban minimalism --ar 16:9 --s 250*

Prompt NO5: *an indoor pool with arch bridge by hotel, in the style of medieval inspiration, light red and dark aquamarine, contemporary archaeological, naturalistic lighting, piles/stacks, romanesque, urban minimalism --ar 16:9 --s 1000*



5

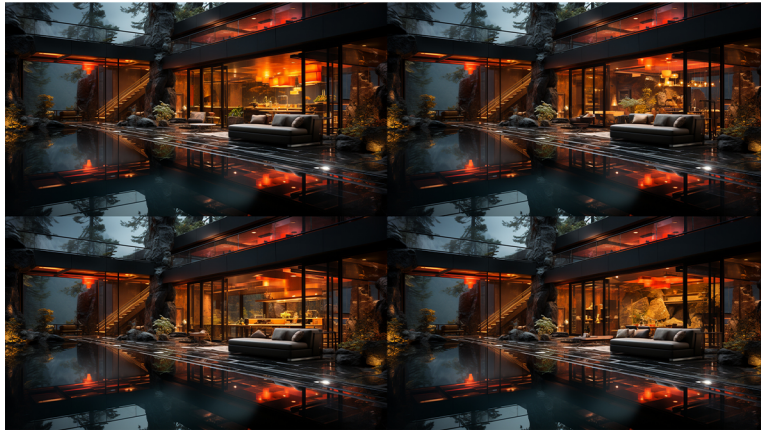


6

By activating the remix mode at setting, you would have the possibility to change your prompt every time you want to generate variations or vary the image. This change should not be too significant otherwise it will not generate the desired image. If an image generation is needed in a more controlled manner, along with the remix mode, there are options Vray with subtle, strong, and regional after upscaling one of the four images. Vray subtle generates images based on the upscaled image with different changes, and Vray strong generates images with more creativity and far like the base image but still holds the essence and atmosphere of it, and Vray regional will enable you to change a selected region of the image and reprompt it.

Prompt NO6: *a dark modern interior with red lights and a pool, in the style of grid work, terragen, 32k uhd, light orange and light gray, playfully intricate, havencore, cabincore --ar 16:9 --s 1000*

Prompts NO6 is an upscaled of an image and prompts NO6.1 and NO6.2 are Vray regional changes



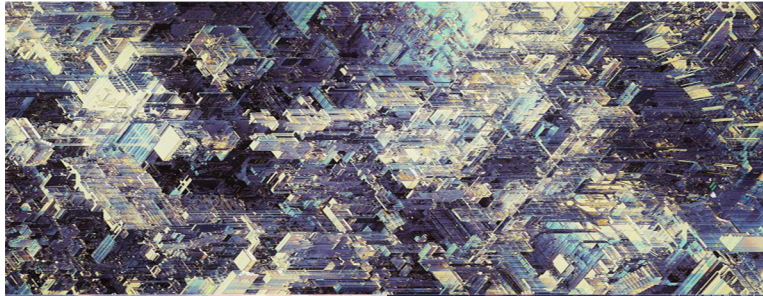
6.1

Prompt NO6.1: *a super luxury and contemporary kitchen in the glass box with the same atmosphere --s 1000 --ar 16:9 --v 5.2 - Variations (Region)*

Prompt NO6.2: *turn this part to a architectural drawing --s 1000 --v 5.2 --ar 16:9 - Variations (Region)*



6.2



REF

One of the greatest features of Midjourney is that you can upload a foreign photo and let the Midjourney translate it for you. In this way, we can have a better understanding of how Midjourney analyzes our images and how it interprets them for regeneration. By writing “/describe” you can either upload a photo or send a write a link. The link must be uploaded to Discord first otherwise it will not recognize the photo, so any foreign link is unreadable.

Reference Image (REF)



7

Prompt NO7: *abstract digital illustration of a city with some buildings, in the style of atelier olschinsky, dark purple and light azure, mahiro maeda, goerz hypergon 6.5mm f/8, aerial photography, mind-bending patterns, enigmatic automatism --ar 16:9*



8

Prompt NO8: *sonic project art gallery, in the style of intricate cityscapes, dark teal and light violet, aerial abstractions, industrial inspiration, coded patterns, tiny-core, highly detailed figures --ar 16:9*



Prompt NO9: *unsemmetric abstract digital illustration of a city with some buildings, in the style of atelier olschinsky, dark purple and light azure, mahiro maeda, goerz hypergon 6.5mm f/8, aerial photography, mind-bending patterns, enigmatic automatism --ar 16:9*

Prompt NO10: *an artist's concept drawing of large buildings in the distance, in the style of atelier olschinsky, dark violet and light cyan, abstraction-cr ation, shohei otomo, petros afshar, high-angle, precisionist art --ar 16:9*



10



11

The aspect ratio is also changing the results of the generation. If landscape and wide space are desired the landscape aspect ratio must be selected otherwise it would generate images that focus on verticality.

Prompt NO11: *he conceived of the structure in his mind, but in reality, the church chapel is the result of his faith, in the style of peter zumthor, water drops, enchanting lighting, kōji morimoto, georg jensen, confessional, wet-on-wet blending*
--ar 35:52

Prompt NO12: *he conceived of the structure in his mind, but in reality, the church chapel is the result of his faith, in the style of peter zumthor, water drops, enchanting lighting, kōji morimoto, georg jensen, confessional, wet-on-wet blending*
--ar 16:9 --s 1000



12



11.2

Changing the aspect ratio along the Vary subtle is possible and it will not affect the focus of the image. But re writing that exact prompt without the base image will generate a different image.

Prompt NO11.2: *he conceived of the structure in his mind, but in reality, the church chapel is the result of his faith, in the style of peter zumthor, water drops, enchanting lighting, kōji morimoto, georg jensen, confessional, wet-on-wet blending --ar 35:52*

Prompt NO11.21: *he conceived of the structure in his mind, but in reality, the church chapel is the result of his faith, in the style of peter zumthor, water drops, enchanting lighting, kōji morimoto, georg jensen, confessional, wet-on-wet blending --ar 16:9 - Remix (Subtle)*



11.21

Prompt NO13: *he conceived of the structure in his mind, but in reality, the church chapel is the result of his faith, in the style of peter zumthor, water drops, enchanting lighting, kōji morimoto, georg jensen, confessional, wet-on-wet blending*
--ar 16:9



The most common phrases

/imagine: writing a prompt to generate 4 photos

/describe: describe a photo via a link (link must be made from discord servers) or photo

/blend: allowing mixing 5 (at most) photos and deciding about the ratio (portrait, landscape, square)

/setting: allow us to access the settings of our Midjourney bot

V1, V2, V3, V4: each represents the variation of a photo based on their base initial image.

U1, U2, U3, U4: each represent the upscale of numbered photo

"--ar X:X": represents the aspect ratio of a photo at the end of a prompt.

"--s X" where $1 < X < 1000$: represents the detail and style of the photo (maximum detail is 1000)

"--iw X" where $1 < X < 3$: represents the image weight of the base image (3 is almost no change and flexibility)

Camera angle controls

Wide, angle shot: far-up perspective

Satellite view: plan view

Eye-level shot: human eye perspective

low-angle shot: worm eye view

Full-body shot: shows the whole body

Glamour shot: use for the portrait

Cinematic-still shot: epic atmosphere

Aerial view: bird eye view

Over-the-shoulder shot: a perspective from behind (human)

Settings

Remix mode: allows the user to change the prompt in every new generation step.

Relax mode: Generating images took a longer time.

Fast mode: Generating images took less time.

High Variation mode: generates images with creativity and different from each other.

Low Variation mode: generates images with less creativity and similar to each other.

Midjourney model: used for every task for generating images.

Niji model: used for anime-style images.

--s 250: the highlighted part is the default preset of Midjourney and it can be changed up to 1000

Most common tips, words, and phrases for image generation with different atmospheres and styles

Realistic, photo-realistic, render, and their similar words describe a scene as being realistic without a certain style.

All the photos are saved in the user's Midjourney account. Certain generated images can be deleted from Discord, but they can be found in Midjourney's user accounts.

While writing a prompt if the user wants to refer to a certain artist, the rest of the prompt should follow the style of the artist.

Example: a picture of a villa with pool and greenery near it in an artistic manner, hand drawing, artistic, minimal color, in the style of hiroshi nagai, Japanese minimal style --ar 16:9 --s 150

Design Process

In this chapter, the process of design consists of the background of a building, using of AI along with the rest of the tools and their end product is going to be demonstrated. It is important to know that The aim of this thesis in short is to experiment with AI and see its collaboration with other tools of architecture. To run the experiment, a building is required to be designed and through its design process, the experiment is going to be demonstrated. Like any project, it has to have a unique story and philosophy as its background to make the architect perceive what space is required. The philosophy of this specific building is unique to itself thus all the future prompts are connected to it since it is the reason why they were written in the first place, it works as its pre-request for prompting.

Curiosity is the reason for most of our discoveries. From the beginning till now, humanity is always after the discovery of their surroundings. These are the reasons why we get deep into our oceans, find new living creatures, study them, and even go to space. In the past and at the beginning we were only after survival of our race, but even then we had this curiosity with ourselves. Perhaps in the beginning, this curiosity was part of our survival mechanism. We were not aware of most of the natural phenomena and their causes, try to imagine how a person would perceive thunder and lighting in the sky! A frightening sound coming from the deep sky, maybe from those soft things from the sky! But they don't have mouths so how do they do that? Maybe the lord who wheels the sky roars us! These thoughts might come childish to us but to the kids, they do make sense because they

do not know what causes lighting. The sound of thunder often scares children and sometimes even adults, and when it comes to primitive times it might have been understood as a sign of threat because they were also scared of it as they were scared of other animals' roars. The curiosity made people to find its source, but since they could not understand it, they started to make assumptions based on what was visible to them. Perhaps what I did earlier was a good assumption for a beginning. Personification and dedicating certain power to certain objects or persons is the first and most natural way to persuasion since this is a valid reason for most of our activities. Who is cooking? Who is hunting? Who brought this? These types of questions can be normally answered easily because we can see who is doing what. Of course, cause and effect is valid for all matters, the issue here is they are not always as primitive as if they can be personified. Now when it comes to the old times people have evolved and along with them, these beliefs have evolved in such a way that they become inseparable. According to their assumptions, their environment, evolving traditions, and many other factors, they tried to explain how our world is shaped, who wheels "the Powers", etc. As we know, our universe is way much more complex than we could find such answers with just theoretical assumptions based on the visible variables. Even with our advanced technology and our knowledge about our universe, we have not yet come up with precise answers, but we are aware that this issue is complex and certain laws wheel the universe. For the first civilizations, when they accepted their assumptions and evolved with them, the worshipping and faith of all powers

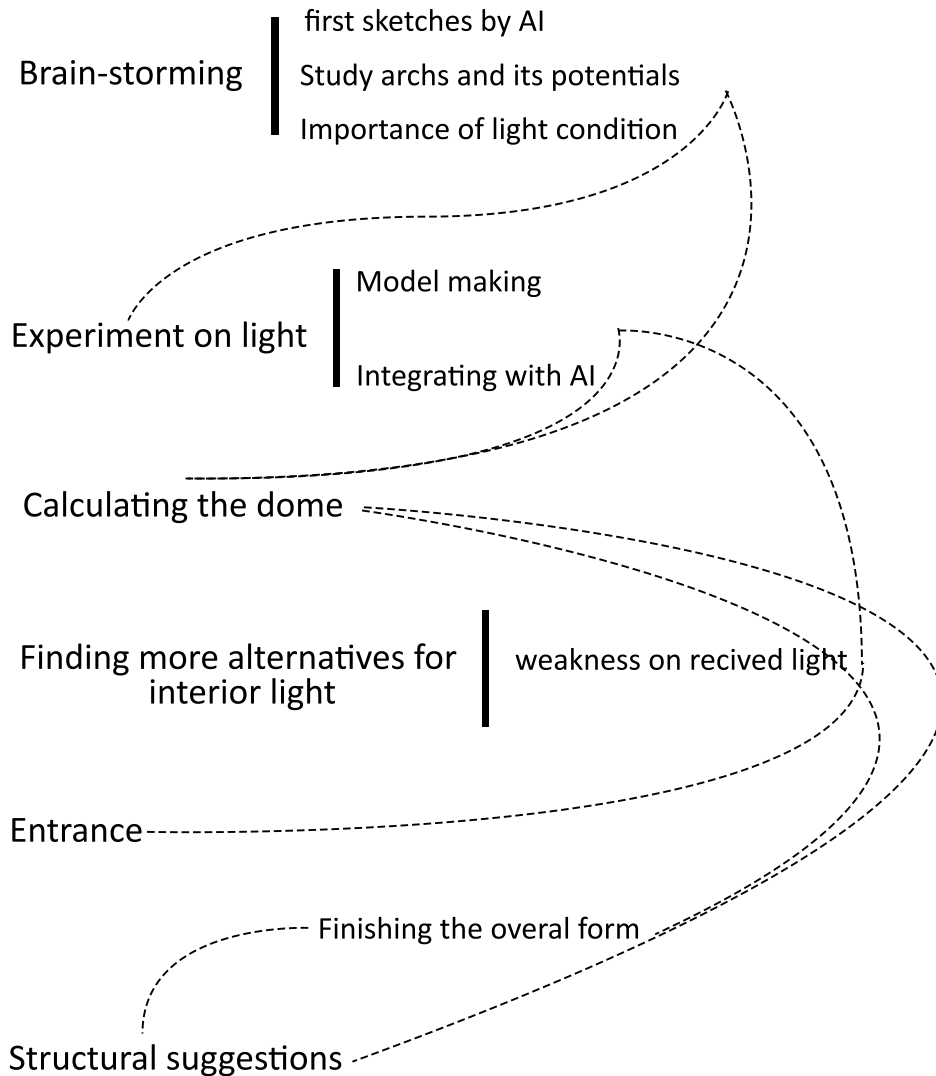
appeared. The fear of insubordination from all powers kept them safe from public criticism since the society had accepted these facts even if the wrath of powers did not strike on certain individuals, the society would certainly try to push them to the right path otherwise they would endanger themselves in front of the powers, families would teach their beliefs to their generations so that they could keep them safe. Perhaps one of the biggest mysteries of humanity is death and the world beyond that. With the theoretical assumptions people even found answers to the beyond worlds and even offer solutions to them. To demonstrate their beliefs, powers, and superiority, they built magnificent social systems, monuments, spaces, statues, etc. During all these processes, people continued learning and exploring their surroundings even though they believed they had the answers to such questions. The result of these explorations and research granted them the knowledge and facts that created the foundation of our science. Even now we are evolving and learning about our surroundings because such a process is unstable, and we need to have in our mind that we should learn from our past because the way that even our civilization has been shaped is rooted in the past. Major wars and conflicts that were caused and are being caused due to beliefs shaped and are shaping our history, such systems can not be denied and they should not be forgotten otherwise, they may get repeated; instead, they should be a lesson for the later generations.

Now there a question appears! Is there any way to unify these beliefs into a more consistent one that can answer our question more accurately? Since our old

beliefs do have a great history and they are merged with all aspects of our lives, we can not fully change them in a short period regardless of the accuracy of the answers. The psychological effects that these beliefs have in our societies can not be underestimated and an attempt to radical change will not be accepted by every society; Even though, beliefs are not as strong as once they were in society. Perhaps this changing phase has already started but its speed is not much significant. Since the importance of education is monitored to societies, people regardless of their status, try to be educated; As a result, they can accept the facts that science and knowledge provide for them, and they can read and study individually at a certain level. If people get unified by such knowledge and science there will be no place for misunderstanding, or superiority; because science operates despite traditions, social assumptions, locations, etc., and each individual can analyze, comment, decide, and behave. In such a society where people act rationally according to the facts, not contradiction, no misunderstanding would take place, and even in the case of theoretical nonagreement, they would approach it in a more reasonable and civilized way. As it has been said, old beliefs are no longer as popular as they once were in society, and due to a higher rate of education across the globe, people do have a better understanding of the science place in the world. As we move toward the future, these ratings are getting bolder and bolder. At some point, science and knowledge should be praised and taught as the singular belief. Every question can be

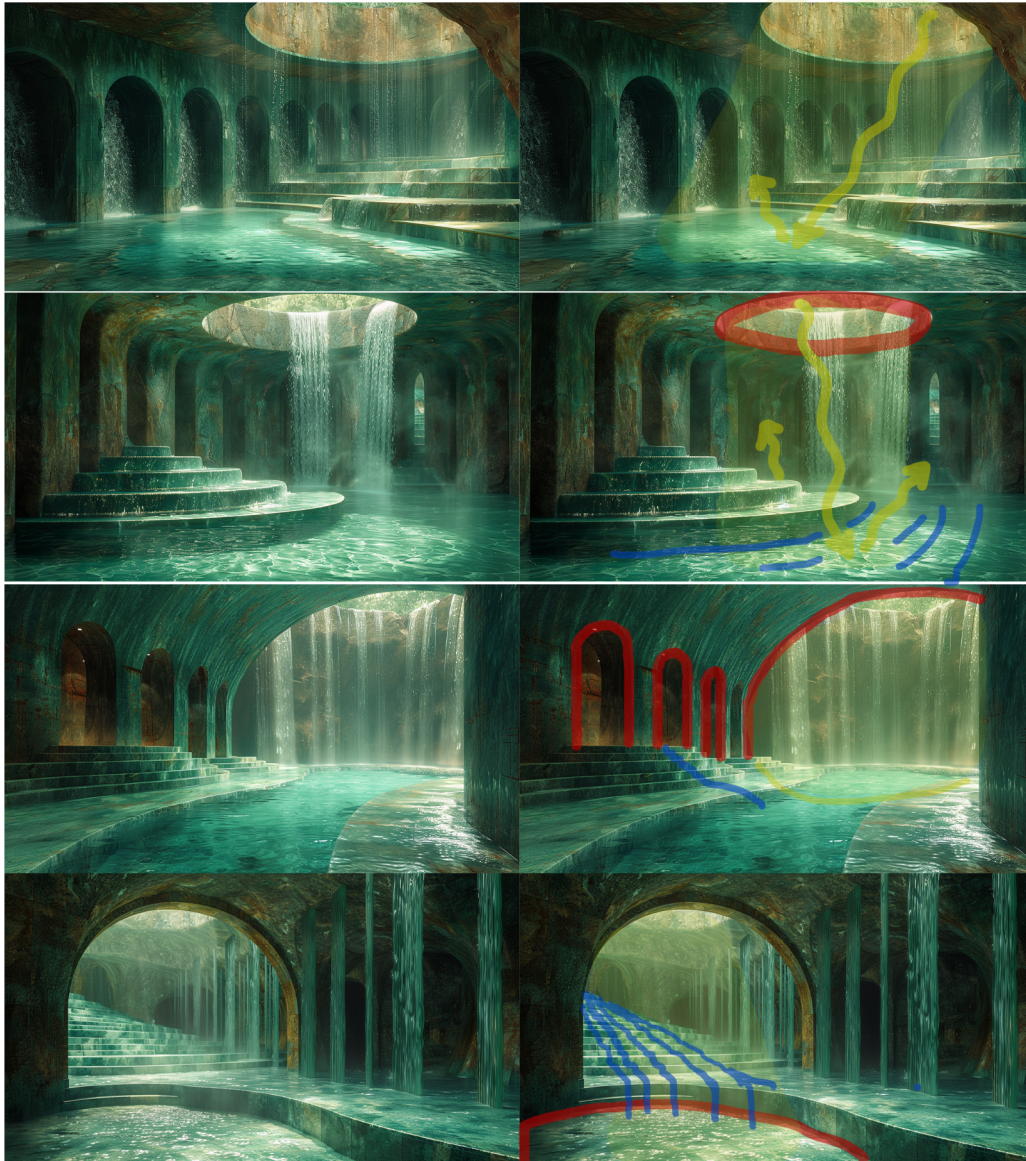
answered by science without any limit. Science even gives the possibility to explain the impossible and unreal world. Perhaps the only way that we can explain everything is by moving forward with unity to a singular belief.

Now I have enough of a certain background and reason to start prompting for certain thoughts that can transfer to space. This part of the design can be understood differently from architect to architect thus these are my personal design decisions for the building. As it is highly dependent on the history of beliefs and as they are embedded in our culture, the classical elements that reference to the past are needed. As in many classical buildings and architecture like ancient Egyptian architecture, East Asian temples, Greek temples, Churches, and Mosques, being over-scale is a sign of the mighty and can be a good reference to both the greatness of the monument and a reference to this project building's evolution of beliefs. Mightiness and strength should be a unity in the project, as a result, any soft material would not fit the strength and mightiness of such a monument. A hard material like stone, concrete, etc. would be perfect to demonstrate the strength. Although this place is referenced from the past, it should carry contemporary feelings as acoustical/light illusions that are not just tools but are felt and sensed. By grasping these atmospheres now we can start writing our prompts to see what spaces can we get. Keywords like Monumental, water, contrast of light and dark, and interior, are used to initiate prompting.



From the previous step, keywords that can describe the space have been obtained. Since the elements of the first prompt are ready, communication with Midjourney can be started as the brainstorming/sketching step of the project. Before starting this step, this should be mentioned that some stages of design at certain points (studying arches, simulating light in the model, and 3d modeling(digital)) were done together, and distinguishing them from one another might cause confusion, but with slight timeframe, I tried to make them more separable. As the graph shows, the design starts with brainstorming and continues with experimenting with the light, the dome's calculation, more light conditions, the entrance, and structural suggestions for this project.



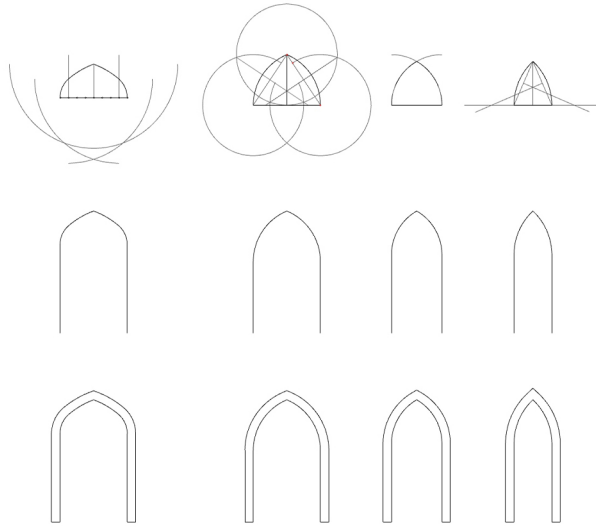


Prompt: interior of a semi monumental curvilinear chapel with series of waterfalls inside, atmospheric, contrast of dark and light, ambient light, artistic, contemporary architecture, in the style of dark turquoise and light magenta, in style of louis kahn and lebbeus woods --ar 16:9 --s 1000

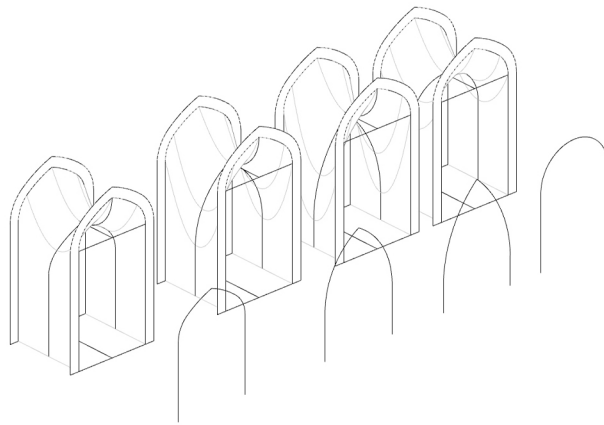
With the results obtained from this prompt, The materiality, sense of scale, atmosphere, and elements was very viable, and it aided me even in adding arches to my prompt to see how it reacts.

Prompt: interior of a semi monumental curvilinear meditation chapel with series of waterfalls inside, atmospheric, contrast of dark and light, ambient light, artistic, contemporary architecture, in the style of dark turquoise and light magenta, in style of louis kahn and lebbeus woods --ar 16:9 --s 1000

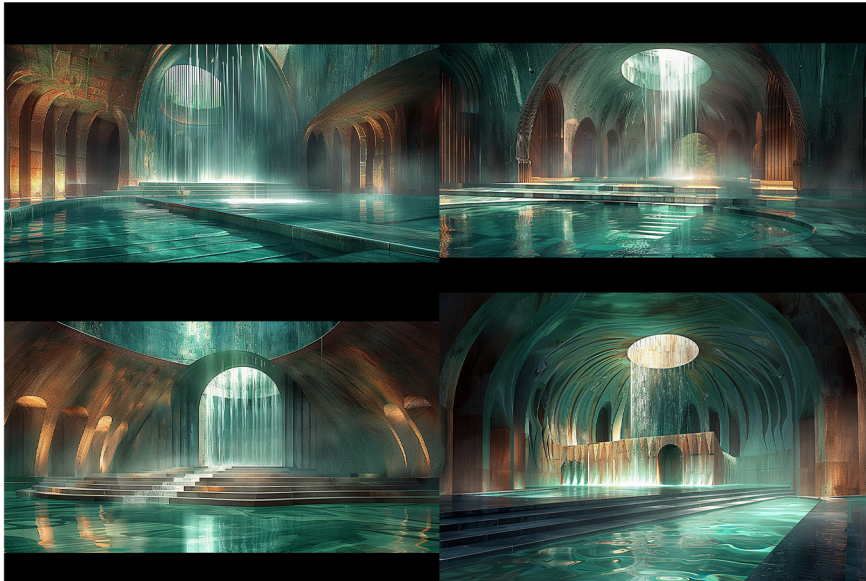
At this stage using arches and their relation to the space became more vivid, in addition to its relation to the space, due to their esthetic and



their capability to load distribution they were vastly used in old times, and they could be great elements to be used for both reference and memory call. Of course, arches themselves have variety and as a result, a short study on how they are drawn and used should be made. Among all these arches, the four-centered arch does have the potential to give a large span without exceeding the height too much. Since the building is going to be monumental, the ratio of the height and its span could be controlled with such an arch.



Of course, this was not a throwback for not exploiting the others' potential. Arches due to their strength in load distribution were used in older architectural buildings and the idea of resemblance from the past could trigger memories of the past is a great solution for the integration of old architecture and philosophy of this specific project.

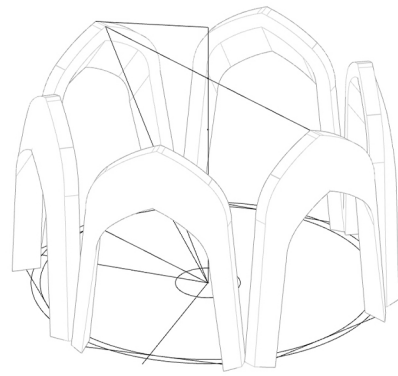


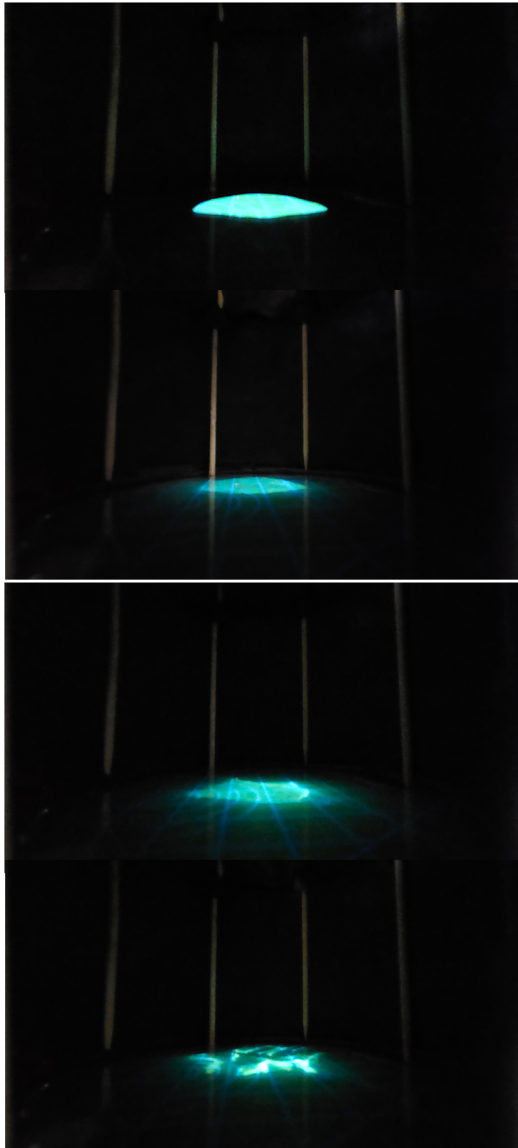
After having the portals and before the modeling stage started, another aspect that was shown as very viable in the generated images for such space was its light condition and reflection in the space. To test the light and its effects on space, first, we have to know its nature. In literal, "light is a form of energy that is part of the electromagnetic spectrum. Light exists in tiny energy packets called photons." This is its scientific definition, for people with no optic disability, the first impression of space comes through their eyes and light is the element that makes this phenomenon possible; as a result, light is the key element that can control the atmosphere.

To continue with further brainstorming, I combined multiple images into one to see the results of the atmosphere, a real monumental (Azadi square) project that has been inspired from old Iranian architecture, light conditions, and the overall relation of their combination.

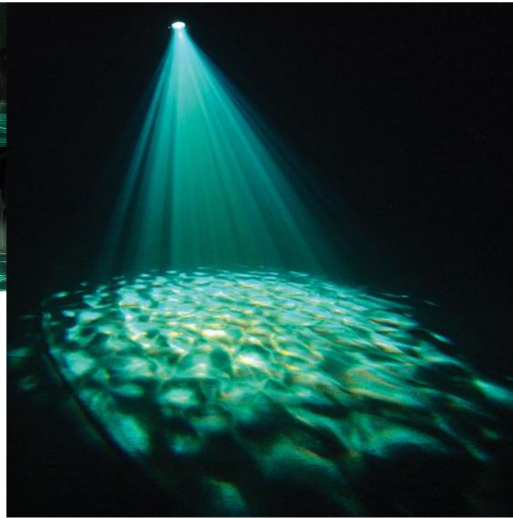
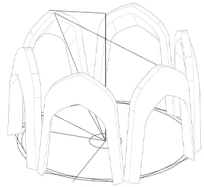


The results suggested a to have the main light source from above. Such techniques to control the interior light were used in Pantheon in the past and distributed the light along with the sunlight. Using sunlight does not just make the space more natural, but also, due to the earth's rotation, we can obtain a living light and living space (in case no artificial light is used), in this case at every time of the day and season we have a different atmosphere. My first prototype was shaped accordingly.

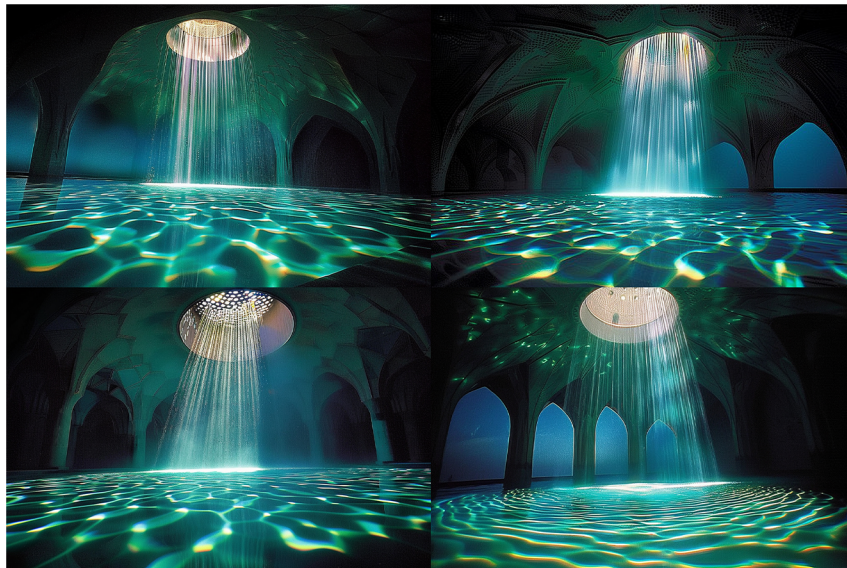




The light condition conducted by Midjourney could be unreal since Midjourney's aim is just to generate photos, not an architectural space and it generates according to pixel manipulation, not sunlight real positioning. As a result, a light model prototype was built with different light filters to examine the change in the interior's atmosphere. In this model, we have only one light source that comes from a circular cavity. The different filters are NO1 no filter, NO2 glass, NO3 shaped glass, and NO4 shaped glass with water on top. Each one of the filters manipulates the light in its way but the one that holds the light more ambient and livelier are NO3 and NO4 due to the earth's rotation.

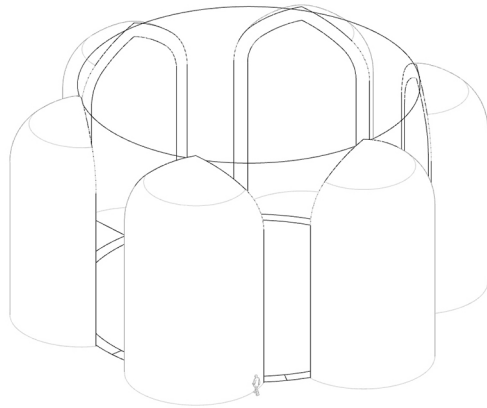


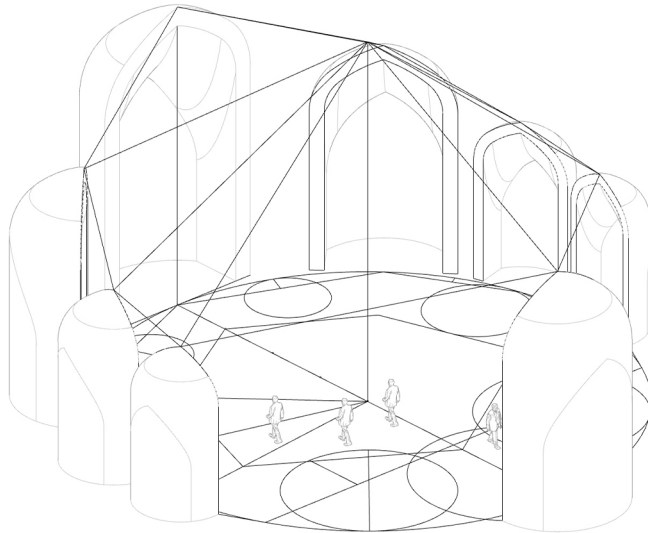
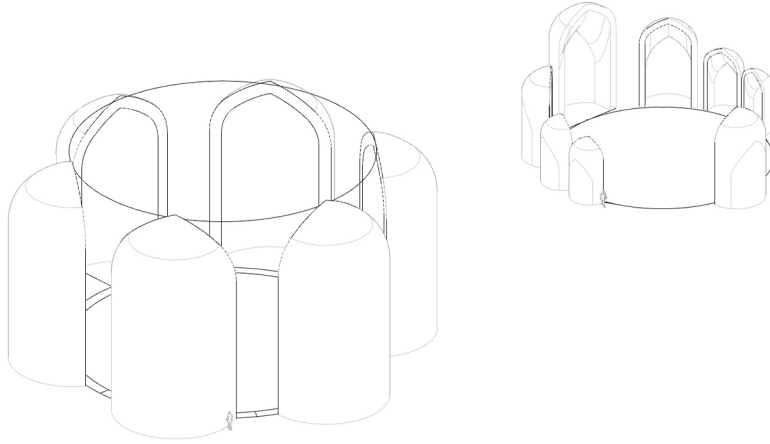
By adding the right light image to the interior, a better photo was generated and that was quite satisfying in terms of elements relation, required atmosphere, and shape. Moreover, the light rays and their effect on the space that I perceived became more vivid when we could find or make photos we wanted to integrate into the original photos. The possibility of adding my own model to Midjourney is also a great advantage that allows us to integrate our own sketches, models, 3d models to certain atmospheres.



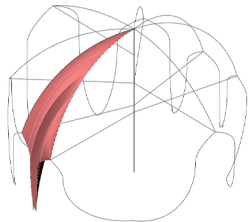
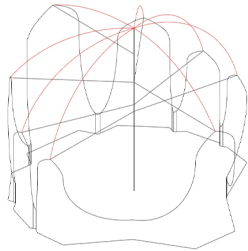
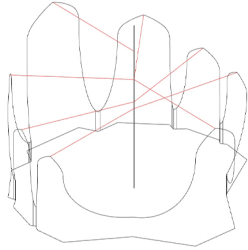
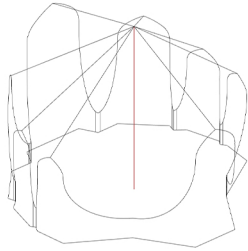


After more and more image generation, I obtained a satisfactory image that was enough for this stage. After this stage, the 3d modeling stage was empowered. It is clearer that more 3d dimensional arches would be more interesting than the original one. This would bring more complexity, yet a simple solution to give a more es-
thetical perspective to the view. Also, when the light comes from the top, there would be a more drastic shadow from human perspective to the top and a single light source would seem more powerful. (since it is surrounded by darker elements)

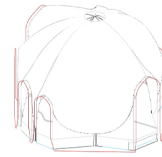
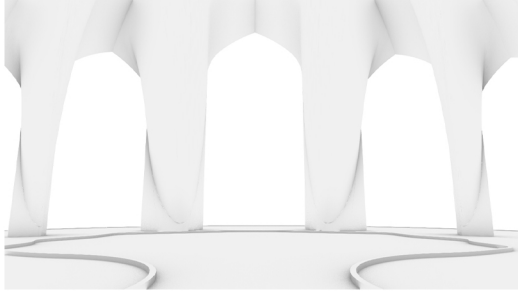




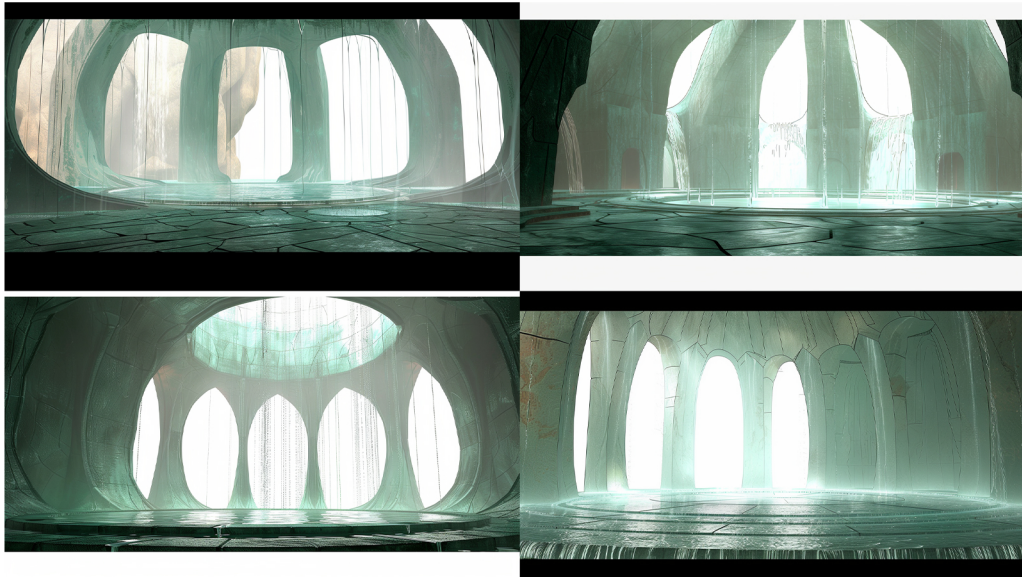
Now at this stage, the project started to shape from inside to outside. As a result, my first attempt was to turn a proportioned model into a human-scaled model so that it is possible to directly interact with the interior. The next step was the roof and a cavity that allowed light to get in. The roof is decided to be shaped in a soft but monumental dome. The reason behind its softness is it should not feel any harshness and it should feel more friendly and welcoming, also the other advantage of using a dome besides its history and rationale, is controlling light within. Due to its shape the distance between the cavity and each point of the dome changes, resulting in a diversity of light distribution on dome's interior. By applying a single living filter to the top, a living reflection with diverse light distribution and unreal. Such a place would result unnatural atmosphere in the space.

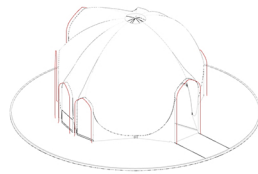
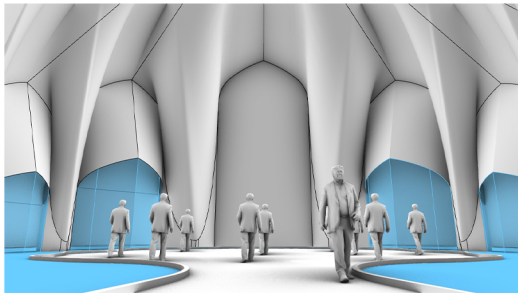


Its shaping was challenging and since each section should work separately but maintain the whole's unity. First, a perpendicular line passes through the ground and center of the dome, let's name this line the dome's center's normal vector, and then from each pointed arch's keypoint a perpendicular line to the dome's center's normal vector is drawn. If we apply this procedure to all the normal vector and each arch, we will gain the first two elliptic arches of the dome. For its connection to the lower parts, If we draw a circle within 0.05m distance respectively to each point, and then connect each arch's key points perpendicular to the circle, we will get the perpendicular projection of each arch to the offset circle. Then draw a line that connects the closest points to one another and name it the connector line. Now from the middle of each connector line draw an elliptic curve towards the z-axis where one point touches the middle of the connector and the other connects to the start of the arch. Now we have four lines of the dome, and the dome can be drawn as such.

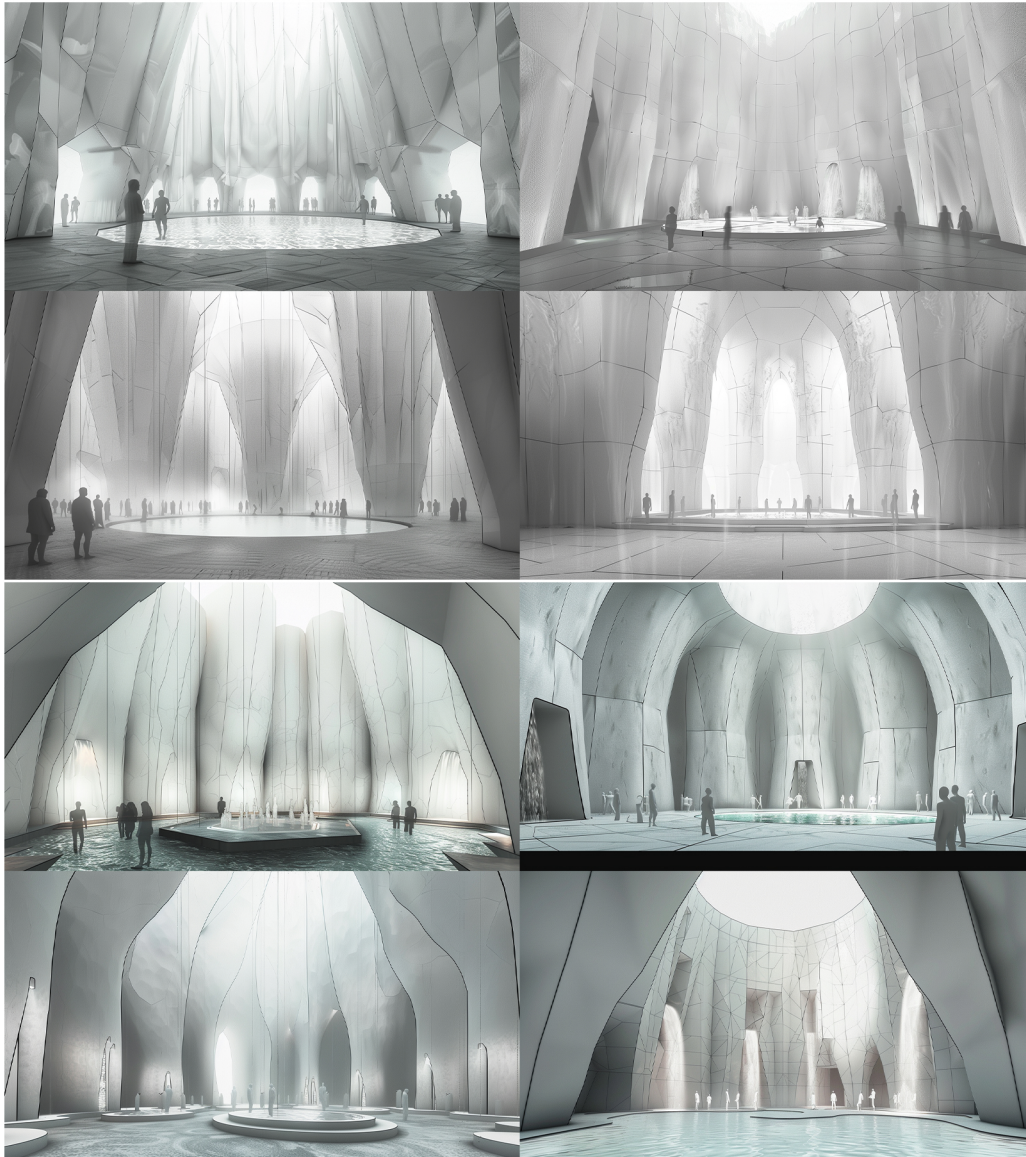


At this point, the dome has a pointed touch to the ground which makes it weak statically with no smooth transition in shape. As a result, the feet that connect and start from each two lower lines are considered. Since the place has been shaped and the interior is perceivable, I started to play with the interior conditions, and my first action was to describe and generate images for the next step. The result was not much of a process and the only suggestion that I could get from these images was, to use a waterfall or water curtain. This is a great idea since it does not only make the water move but also the sound of moving water and its reflection and acoustical effect with concrete in the interior could further enhance the relaxing feeling.

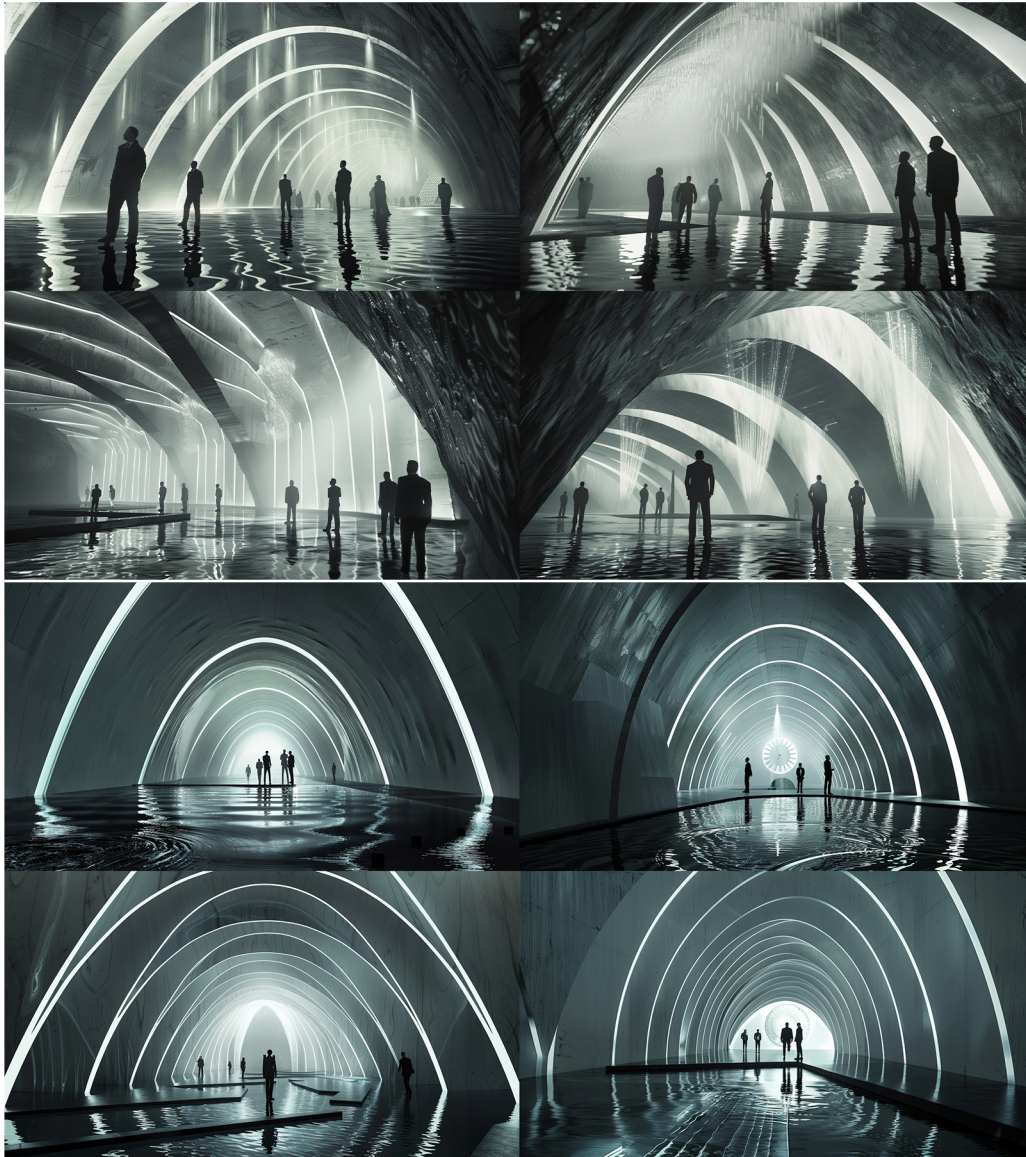




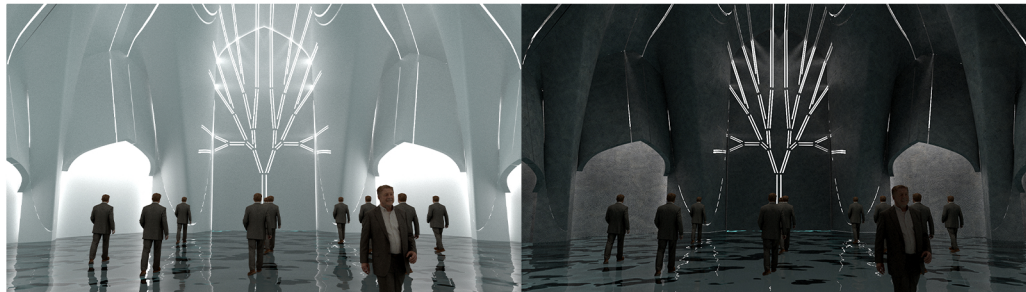
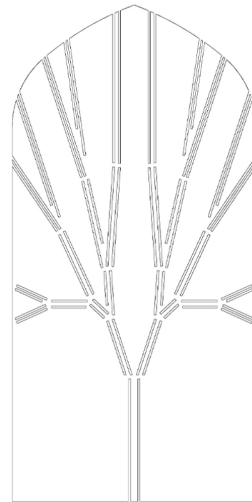
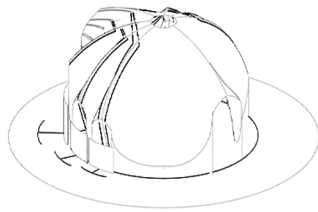
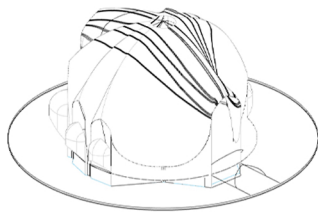
In order to decrease the entered light, I closed all the light entrances except the top and entrance openings. In the very first spot, it was obvious that the interior lacked light. The light coming from the dome's cavity was not sufficient and the darkness would likely bring fear instead of peace. As my first act for changing the present atmosphere, I played with the interior sunlight gain. These results were impressive and quite inspiring, and they gave me an idea of how to control the gain of light through the other arches combining this idea with the water curtain, the relation between inside and outside can be restrained. So I made a 0.2m gap between the water surface and the six side arches along with a curtain water. One of its through backs were the problem of acoustics and its possibility. If water does not come with enough pressure there will not be any curtain water and with pressure, the reflection sound can be quite disturbing, as a result, I describe the outputs to Midjourney to see what suggestions it would give me.



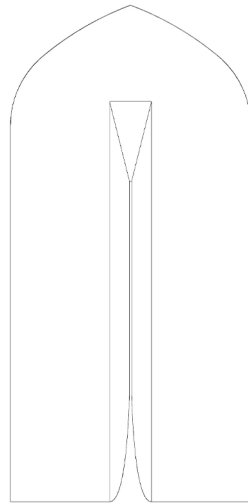
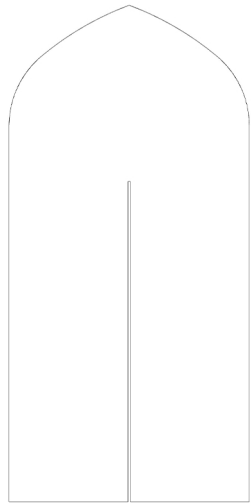
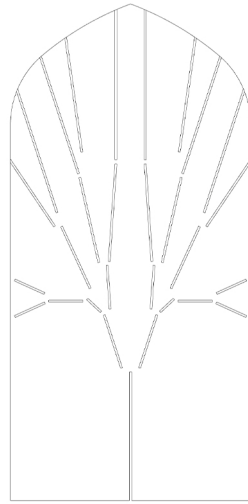
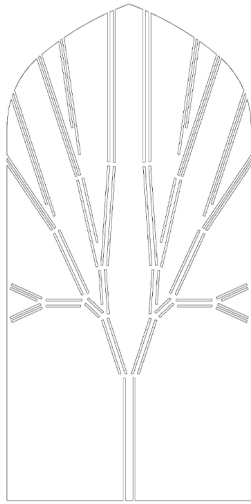
The results in terms of direct suggestion were not satisfactory, the idea to have a centralized light was quite an idea nonetheless. This could be rooted in the superiority as the sharpest light in the space. In this way, the center of attention could be directed more toward the symmetry of the space. The part that I am quite unsure about is that materiality is not considered. The color that Midjourney suggested is mainly white and regardless of the material, the place will be shiny due to color and this is a contradiction. On the other hand, it gave another perspective that, the shiny place can be an option for the place so I took this advice to a test to see what results it would give me.



Before doing the test, I asked Mijourney along with my model to suggest some options so that the arches would not be the only light source for the interior. The suggestions again can not be driven directly but they gave an option and idea to test it if it is suitable to get light straight from the dome itself. Even before the test, I knew that giving a cavity to the dome could have consequences on its static but to explore more to see what results it would give me I tried it. The reflected surface along with strips on top that connect the ground to the top would give a sectioned design and with proper dimensions, they could be an option for to give a movement to the interior.



In order to test the lighting conditions that Midjourney suggested, I first gave a hollow tree shape to the central wall that could represent the rise and distribution of light that continues all the way to the dome and ends at the center of each half arches. Another factor that changed the interior condition was materiality, so I took this test with two different materials. The reason behind it was to see the differences in color/texture and reflectivity of the materials. Midjourney at some point suggested white while it illuminates the space more than anticipation, as a result, it can come to different conclusions and if the materiality is being decided, it gives unsafe and unsure suggestions. The interior with all these tests, even with the darker walls, was illuminated more than I wanted, and the bigger problem was the sectioning method of design that made the dome unstable and makes it impossible to apply. Perhaps if the space was anticipated to be bigger and longer, this method could be useful.

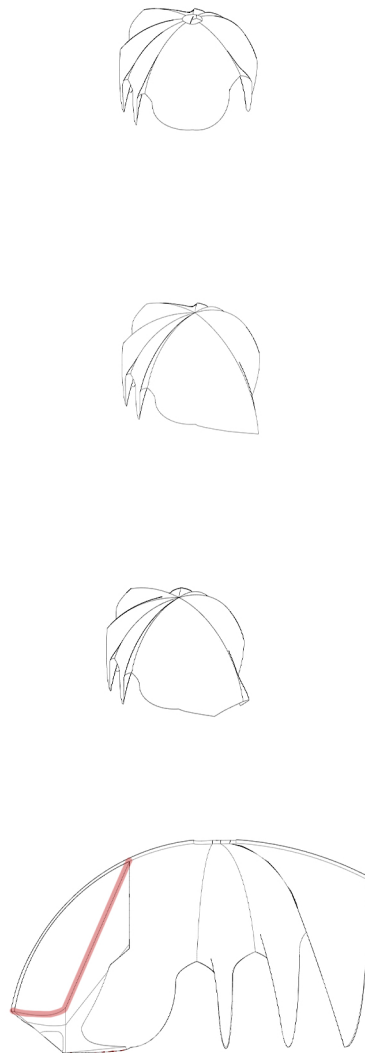


The previous test on illumination was not as I anticipated, but the central light that could fit into the theory was a good idea. Its positioning, theory that looked like a tree for symbolization, be the central attention and on the center of the cemetery all make a light source more visible and valuable in such a design, so I started to work and evolve it. The first prototype was unstable since a 5cm concrete gap is not a realistic approach. I changed the double system to one so that I still could have the form of the tree that illuminates the space. Even with such changes, both the stability and light conditions were still not satisfactory. Instead, I changed the form of the tree and tried to abstract its purpose to my design. The idea was to rise from the ground and show its singularity which could be both formal and philosophical, as knowledge is the only asset that can illuminate us from the darkness. With further design, I gave some minimal changes like giving that curves form that shows this rise, and lesser the thickness of the light source to have less concentrated light.

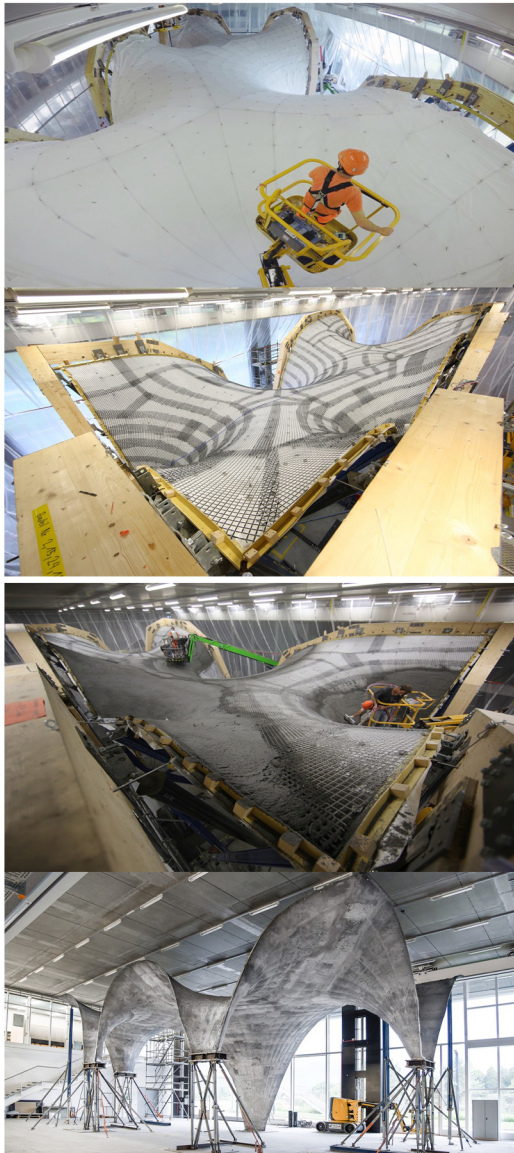


Since the design was started from the interior, the outside of the gate for, the entrance, was still too raw. For suggestions, I described the exterior to Midjourney with materials. The reason behind it was to give suggestions based on concrete and water rather than a soft material, so the results would be more legitimate. Even with the highest image weight, Midjourney was unable to make a gate and a transition for the space. And even at some examples, it was unable to perceive the scale of the complex.





indoor and is more human-scale friendly. So a part of a dome, the front view, had to be changed, and instead of finishing till the arch, it had to continue all the way down. The part that touches the ground can be cut with a 45-degree angled plan. In this way a doorless gate with less light is obtained. Now a smooth transition can be made by the portals all the way up to the dome. This will make the transition not only smoother but shows the exit in more effective way for people inside.



Photos by: Block Research Group, ETH Zurich

Even though the aim of this project is to explore and experiment with Midjourney, the tectonics, and structure can not be denied if the project is proposed to be buildable. One of the challenges of this experiment was that I worked mostly with the interior and Midjourney is an image-generating AI, not a direct architectural tool that perceives space, dimensions, and structure. In fact, Midjourney can not, currently, give a different perspective of the same space and it is one of its through-backs. What Midjourney provides us is a single scene of a frozen time that itself does not have adynamic, thus it is the architect's responsibility to give life dynamics. The structure of any kind is a complex process that binds materials, their futures, and mathematics together and this can not be anticipated from an image-generating AI like Midjourney. During my process, I tried to make the dome and arches in a way that could transfer the loads to certain rules of physics and the rest was to look at projects that have solutions for such a monumental concrete.

Project "NEST Hilo roof" is truly an

engineering masterpiece. This project was conducted by Block Research Group, ETH Zurich which is capable of carrying a structure similar to mine with less concrete and thickness. The self-resiliency of the structure comes from the cable-net used inside. In this way, we can give certain freedom to our shapes while obtaining light structure. The self-resiliency of the structure comes from the cable-net used inside. In this way, we can give certain freedom to our shapes while obtaining light structure. For its process, first, the cable net should be designed according to the geometry of the shape and it should be stabled by a foreign structure, then the fabric would lay on it, and afterward, a textile reinforcement layer would come that would work as a reinforcement for the concrete layer. At the end, a thin concrete layer is sprayed on the surface. There are extensive similarities and differences between my project, both of them carry a similar way of force distribution in which arches are responsible for carrying the load, the differences are first at the scale of the project. Even though the NEST



Reference Image

Hilo roof project is gigantic, its scale is far less than my project, but overall it does not change the force distribution since it is more dependent on shape. One of the advantages of NEST Hilo roof's is its thickness which becomes a disadvantage in my case since the dome thickness and wall thicknesses do change the incoming light, as a result, this has to be changed when it is converted to my project.

In order to see what Midjourney would give I defined one of the project photos to it and it described it as follows:



(1) high quality photo of two large concrete steel sculptures in the process of being assembled inside an industrial building, suspended from the ceiling and standing on stands with forklifts nearby, in the style of Zaha Hadid, archdaily photography award winning photograph --ar 120:67 --s 250

(2) Three large gray concrete sculptures in the shape of half arches stand on stands inside an industrial building with high ceilings and windows. Construction equipment is visible around them in the shot from behind the objects. --ar 120:67 --s 250

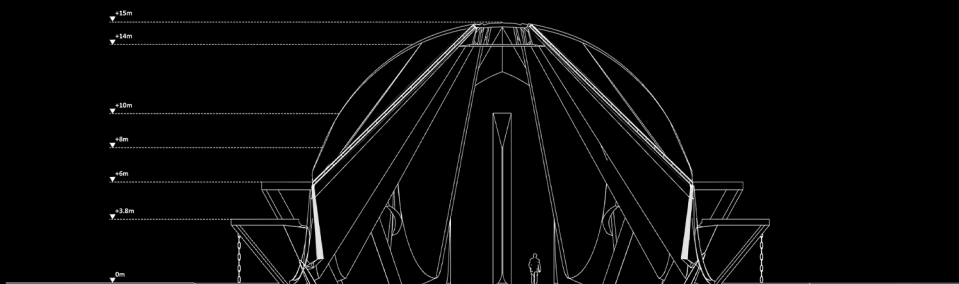
(3) A photo of an interior space with two large gray concrete sculptures being constructed on metallic forms, suspended from the ceiling in steel robotic stands inside a modern hangar facility. The sculptures appear to be in the style of industrial modernism. --ar 120:67 --s 250

(4) A large, gray concrete piece of art is being constructed inside an industrial building with high ceilings and windows on the side. The structure has three curved elements that resemble wings in shape. In front of it stands several cranes lifting steel beams to form them into their final position. A forklift flies by in motion blur. There is also construction equipment visible around the site, indicating work in the style of an island. --ar 120:67 --s 250

The outcomes of the prompt were some sculptures and Midjourney more focused on the whole environment rather than the NEST Hilo roof project and it makes sense. Midjourney's aim is to generate images, but those images are not necessarily real and follow the laws of physics as it does not calculate the generated forms to see if they are buildable or not. In this case, even though it did not help with the calculation of the dome, it grasped the scale of the project to a certain extent due to the presence of those elements in the reference image.

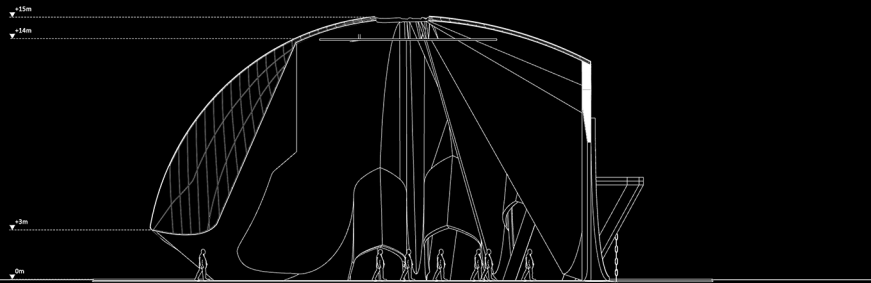


In this chapter, the end product will be shown and discussed. As discussed throughout the chapters, The project (proposed building) was initially about designing a spiritual space for future that carries the historical heritage by certain architectural elements. With the spread of knowledge and education around the globe the meaning of spirituality will change, and people consciously will select what to believe. As many of our questions about the universe are answered by science and knowledge, there will not be a need for other assumptions. The universe itself consists of certain rules, rules that can not be evaded, dodged, or denied. If one day all our knowledge is erased from our memories, we can explore them exactly as how they are today because they are the facts and foundation of our universe. The same thing is not valid for the assumption as they depend on our understanding of the universe not always its facts; Even so, the past should not be forgotten nor denied as they were part of this great exploration. During all these years that we have lived in our community, each obtained a different

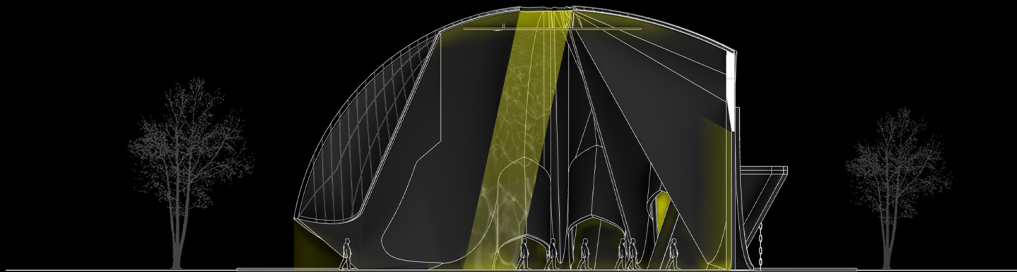


Section E-W

assumption and aspect of life, culture is a pattern that certain communities follow. All our experiences, from childhood till death, are all in certain space with certain culture. It is inevitable to confront our past because that is what makes us, us! But we should be aware that our past and our beliefs should never cloud our exploration of science and knowledge. At first, the project Avant-garde Temple was supposed to be a space for meditation, but now it is a space for exploration. One singular space that can host not just one activity but an unlimited activity. The future indeed is uncertain and long-living contemporary spaces require flexibility in accepting many programs. This place offers a dark and meditative space that resembles curiosity and the need for exploration. The six side arches with different heights and the opening, from lower to the highest in the middle, represent the prosperity of knowledge from the past till the future and in its maximum power (at the center) the global awareness, and global consensus, thus peace, will achieve. If and only if we move forward straight to it we will achieve such achievement, a



Section N-S

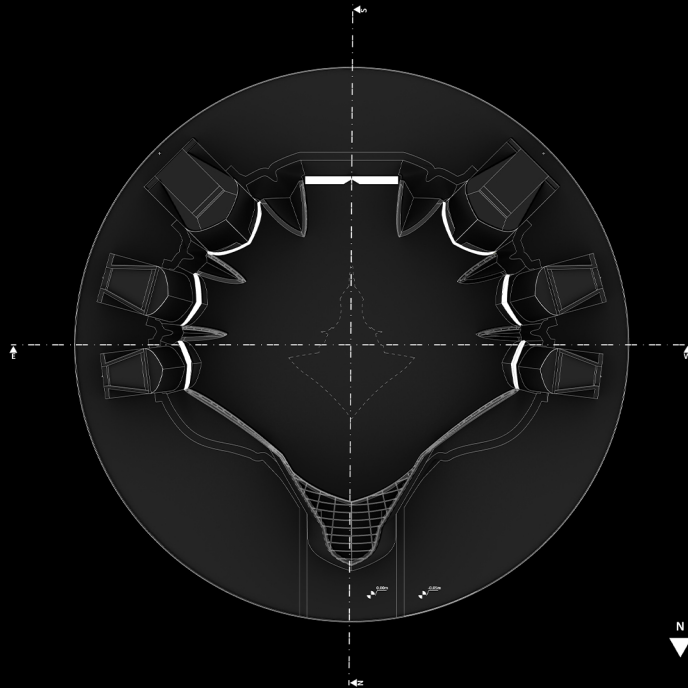


single assumption other than science would disrupt the process, cloud the judgment, and take us away from the light.

Its gigantic and monumental size shows the scientific glories we achieved and its overall shape was inspired by both Midjourney's suggestions and our old architectural buildings that were designed for religious activities.

The water curtains and water in the complex show the movement of life and the pool that holds the water in the complex exists both outside and inside, and while we walk into the complex we change and interpret with its movement the changed watercourse, change the light reflection and thus the whole space. Even a single action would have consequences. Even though the outcome (the project) is finished, there is still room for the exploration of AI. The first act is to define this building to see how Midjourney would define the space:

an architectural render of an interior space made from black stone, the ceiling is symmetrical and has



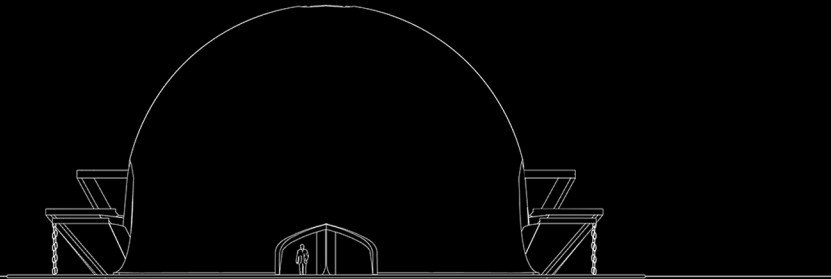
tall arches with light coming through them, there's people walking around in it, the floor looks like water --ar 16:9

An architectural render of an enormous dark cave with tall arches and people walking around, the walls have a parametric texture that resembles stone or concrete, there is one small light coming from above in front of them, the space has lots of negative spaces between all its elements, people can be seen exploring it, hyper realistic, cinematic --ar 16:9

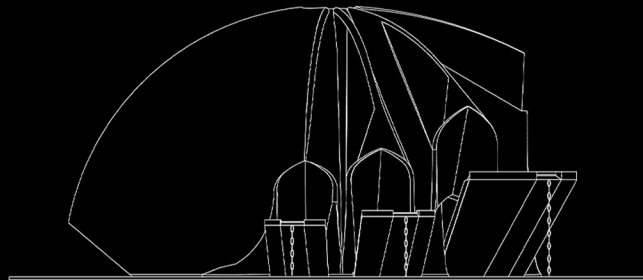
An architectural render of an underground dark cavelike structure with walls that form arches, with the entrance at one end and two doors on each side leading to small rooms. People stand in front of them looking up towards light coming from above, creating shadows. The scene is lit by soft white lights, giving it a mystical feel. There's no direct sunlight or other lighting inside, highlighting details like textures and materials used for construction. --ar 16:9

interior view of an architecture pavilion

with tall ceiling, with several arches and columns in the shape of abstract shapes, a light is shining from above, people walking around, modern style, dark grey stone walls, concrete floor, octane render, high resolution photography, hyper realistic --ar 16:9



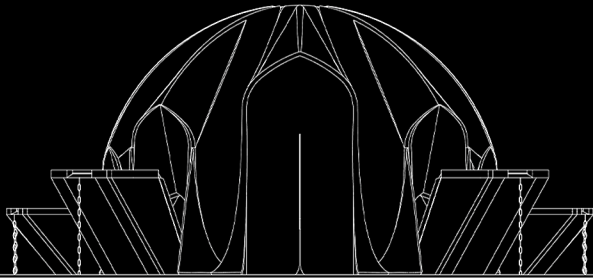
North facade



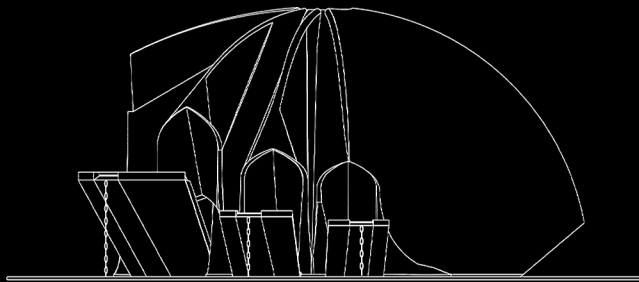
West facade

in most of its definitions, it describes the scene as an architectural render that carries certain architectural elements. It even understands the abstracted shape and the light condition where there is no extra light which is fantastic considering the water's reflection, mystical feel, and people inside but overall, it cannot describe the reasons why these elements are selected and why they are formed together. It describes the photo as a scene instead of a space where there are water movements that make sound, and the sound is reflected through concrete and echoes to the space. How the light is reflected to water from the ceiling and filter and how water movement affects this light condition. Of course, such a description requires a time frame and a photo cannot describe such an atmosphere,

perhaps one of Midjourney's greatest drawbacks for architects is its lack of movement in the space.



South facade

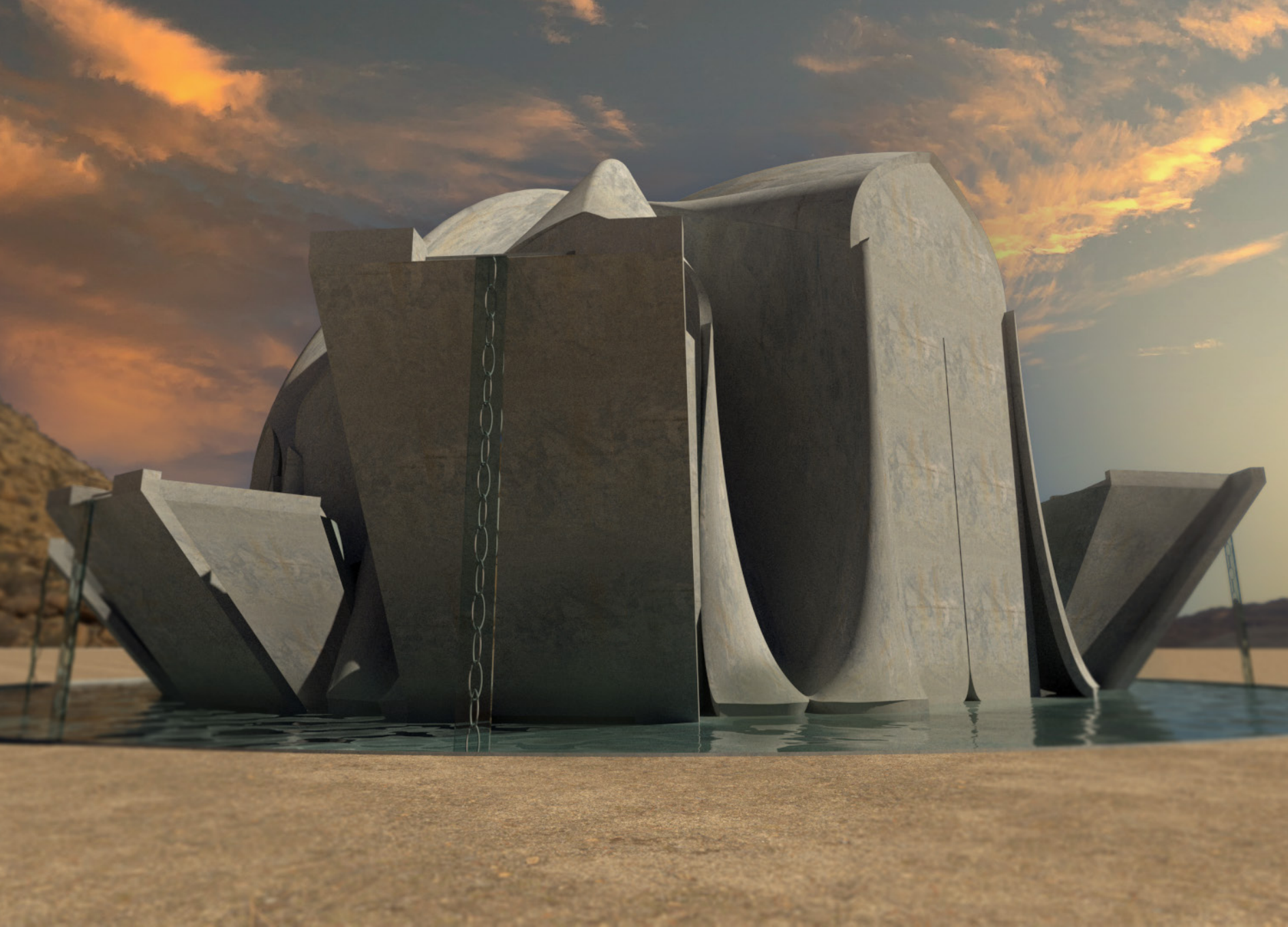


East facade



- Concrete
- Textile reinforcement and fabric shuttering
- Cable-net
- Columns (main structure)
- Cable-net
- Textile reinforcement and fabric shuttering
- Cladding
- Feet (main structure)

Very similar to the “Nest Hilo roof” project, I intend to suggest a similar structural system for the space. As it was demonstrated earlier, the Nest Hilo roof is a light roof structure that can be shaped in different forms, as long as the physical and mathematical principle accepts, and it is self-resilient and does not need any extra support to carry itself. Even though I can use the same structural system to shape the dome’s form, the light condition and possibility of extra weight for future events, make the dome’s sole structure insufficient. Since I need at least 25cm thickness to be able to have a semi-concentrated light, I need to make this thickness by applying the construction procedure two times. Since the structure of the first layer is going to be intertwined with the second layer, the stability of the dome is going to be enhanced (this might be necessary due to scale differences). For the extra events that may require extra support, and to carry the top glass, six bent columns are introduced that allow the Nest to lie on it. This will not only give extra support but also make the construction easier as the nest no longer needs to be one piece, and each part of the dome can be built independently.





Reflection

Humanity's knowledge is expanding at an incredible speed and catching it is and is going to be a challenge for people. One of the greatest and most fascinating technology has arrived and it has been integrated into people who know how to use it. AI is an incredible achievement that has access to all our databases, and it is training to understand, analyze, and function. Its growth and the way that it works, functions based on intelligence, make AI a futuristic tool for the future that will surely change many professions. This thesis was a great journey that started with the realization of AI and its potential and ended up with an experiment to use it as a tool and a process to realize a project. This thesis focused on image generation AI called "Midjourney" that can generate images based on written input called prompt. As an AI, it has similarities with humans. It can realize and understand what we want when we write a prompt at first glance but control it and generate the desired images based on a specific atmosphere, light condition, materiality, camera perspective, style, scale, etc. for architects required to master this communication. With enough tests and experiments on prompts, the way sentences have been written, word weight, spelling mistakes, word order, etc. change the outcome. In this thesis, I had the opportunity to go through an experimental design process using Midjourney. The beginning of prompting can be quite challenging especially if there are not enough assets to start. To find assets I tried to find a reasonable discussion and conclusion on a specific philosophy. Something that bounds traditions, architecture, our past, and the future. By coming to a certain conclusion about the future of beliefs through people's awareness, I obtained certain reasons and feelings along with some architectural means that bound the philosophy to words and words. That was the moment that assets for prompting were accomplished. To continue to turn the words to space, I start prompting Midjourney and get clues of what AI would perceive from my understanding of the philosophy. By getting results, I changed the prompts or regenerated more photos according to certain reference points at which I obtained scenes that have the potential to elaborate to become space. Now it is the architect's responsibility to raise/add, eliminate, and manipulate the scene. By understanding the lights ever importance and the usage of arches that have the taste of history, the path became clearer. During these processes, one of the key points is not to get drowned in Midjourney's beauty as it is just an image generator, not a tool specifically designed for architects. Some of its results can be unrealistic and we should be aware of this issue. It is our responsibility to test conditions such as light conditions and scale and if necessary, we should simulate them with separate software or real models as happened to me. Making precise decisions is key not to getting into a loop of image generation. I took such decisions as making the design absolutely symmetry like ancient buildings even though not all generated images supported such an idea. One of the other advantages of Midjourney compared to rendering a scene is that renders give what we model but Midjourney gives relevant suggestions according to need and opens the door of opportunities as if you are not solely designing. I took some of its ideas like the idea of the waterfalls and applied it in a different shape and manner. Midjourney is capable of design and esthetic suggestions but when it comes to calculations and precision, it loses its weight. While calculating and designing the dome and structure it required both designing and physic's laws, Midjourney was

not as helpful as the previous steps and for those aspects, I had to rely on my knowledge. All in all, this experiment showed that Midjourney is indeed a capable tool for architects, architects should be trained and experienced beforehand to be able to use it properly. The solutions it offers are indeed beautiful and sometimes too good to be real, but we should always have in mind that it is not yet perfect and it is not only for architects but it can be used for scene generation to initiate a potential for space and without architects and architectural solutions, it has a long way to make space as it can not draw a second perspective from one scene. Images are two dimensions, but space has more than two dimensions. Space carries time frames, time frames carry memories, and memories carry us. It is a long way for an image generator AI to design space.

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