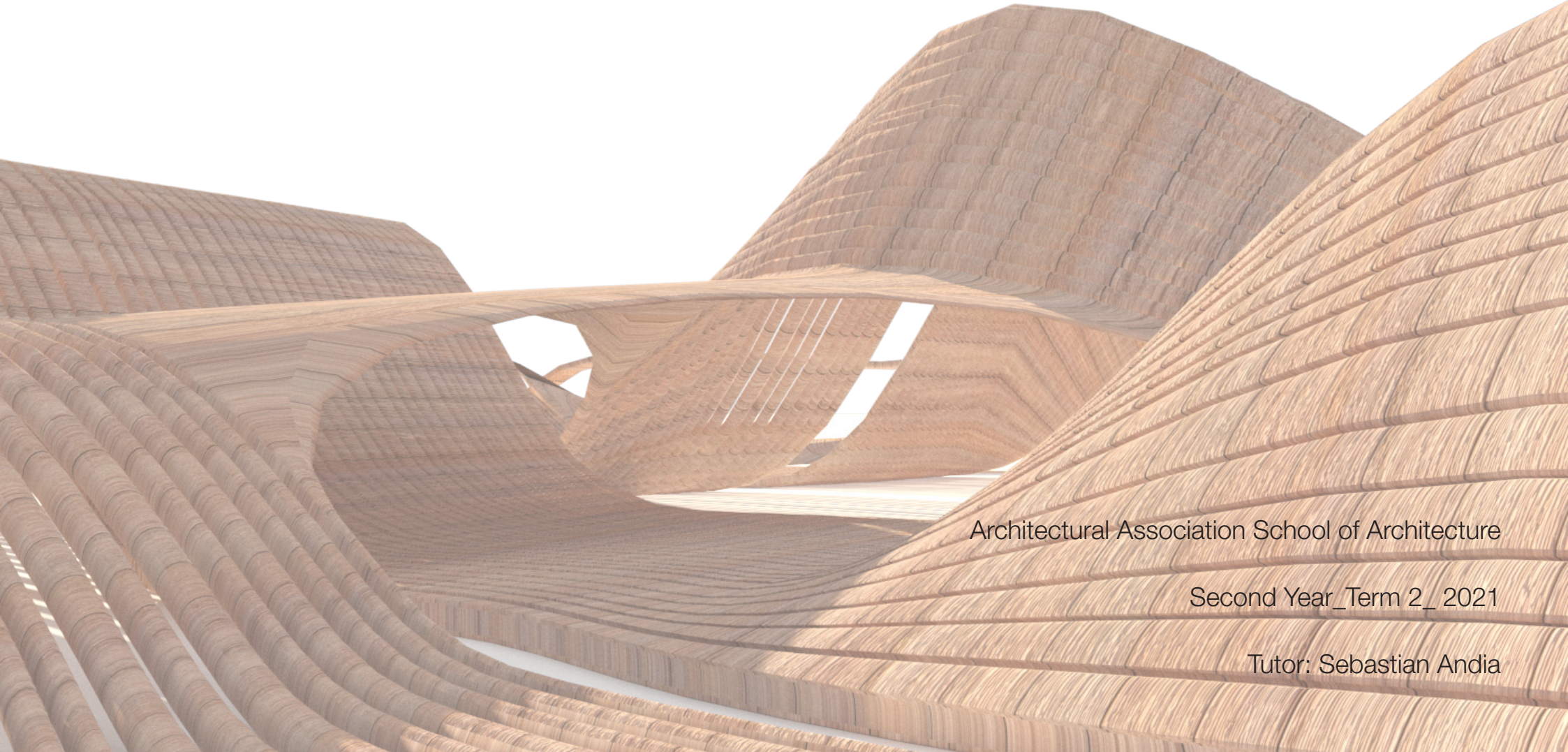
# Communication & Media Studies

## ABSTRACT NATURE

Daphné Esin

*Shading Waves*



Architectural Association School of Architecture

Second Year_Term 2_ 2021

Tutor: Sebastian Andia

# ABSTRACT

This project is about using the 3D modeling software Maya to work on a conceptual idea for a pavilion. The starting point of the design is the interpretation of an abstract nature image in terms of shape and materiality using polygonal modeling techniques. The name of the project is *Shading Waves* and the pavilion is trying to generate different moments of shading on the desert. The bumps creating shadows are somehow replicating the sand dunes and make the structure in complete harmony with its natural context.

# TABLE OF CONTENTS

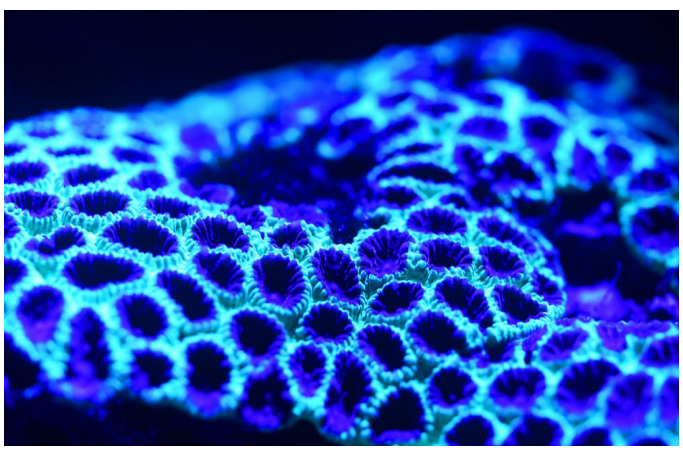
# ABSTRACT NATURE PICTURES

Intersecting fan-like shape with thin stripes on it

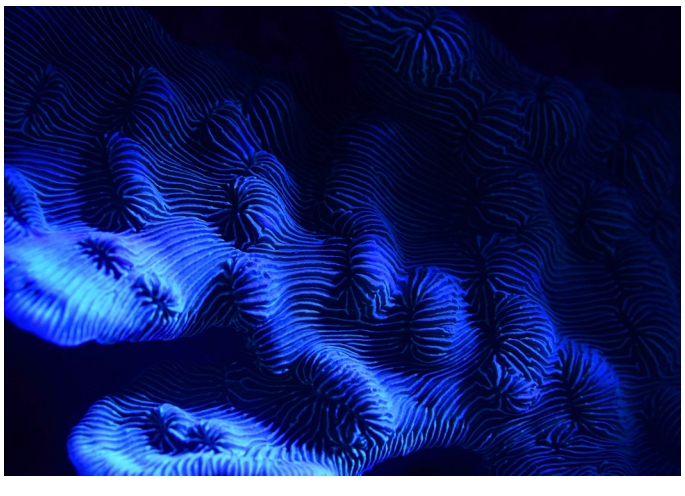
Soft surface with islands of pressed dough that form small holes in the middle.

Holed, bumpy textured and yellow curved elements unevenly scattered on a rounded surface.

Cone shaped elements that remind fractal art. In fact, the image is a repetition of the same conical shape in different scales, the big cone shapes gather infinite amount of small cones on their surface.

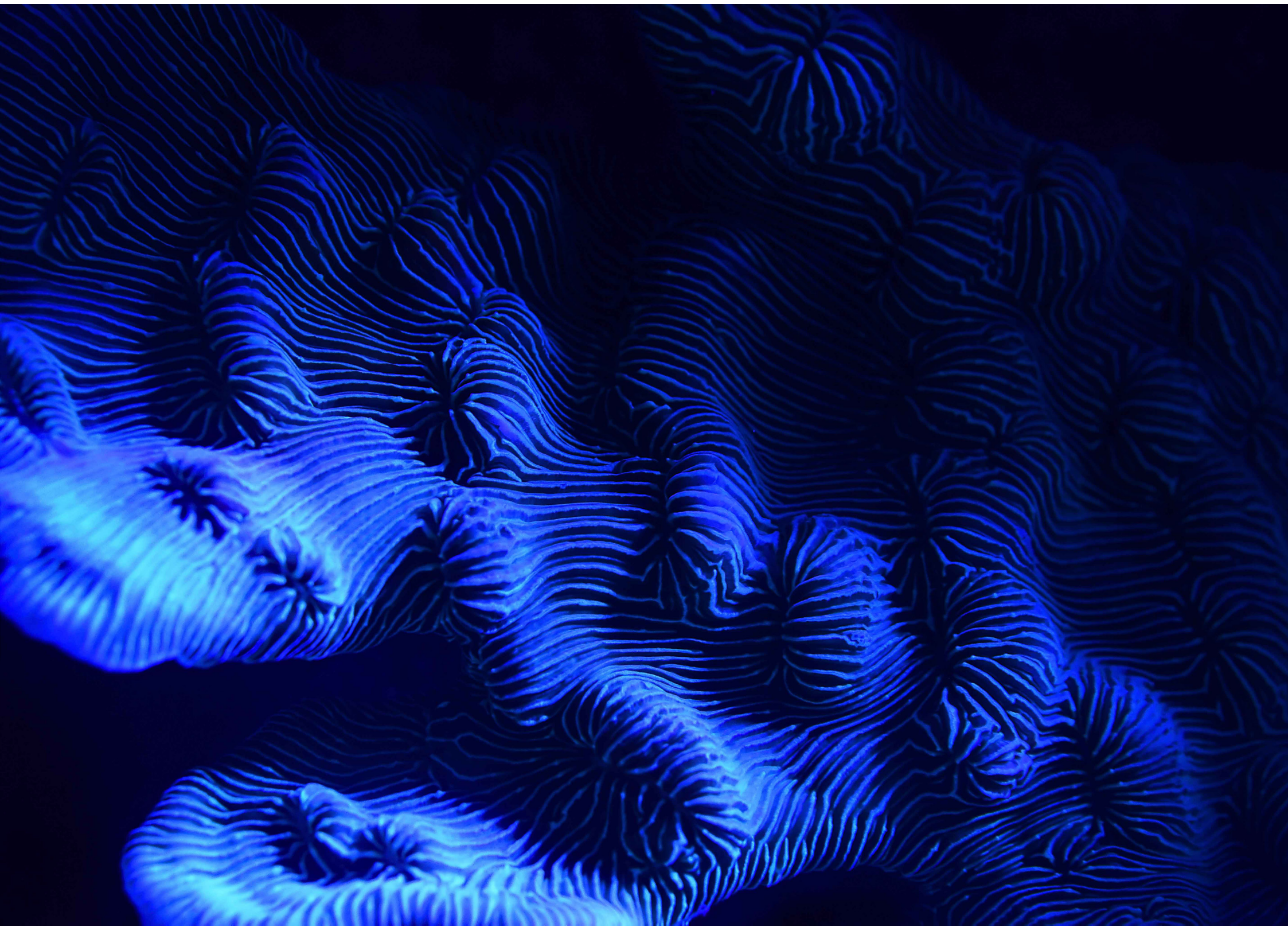


Irregular surface with negative bumps creating holes of varied dimensions.



Irregular volume that has bumpy elements and is covered by long stripes.

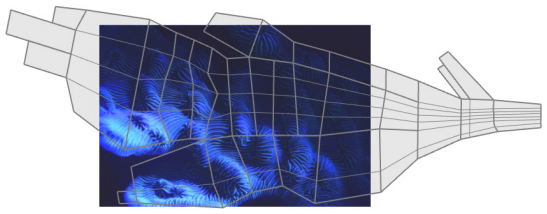
# CHOSEN IMAGE



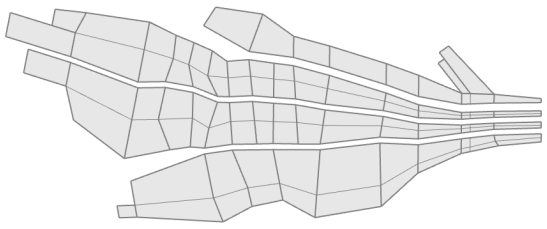
The most eminent feature of this image is the multiple bumps producing different instances of shadow. The thin stripes all over the natural element give a strong texture to it.

One of the ways to replicate these elements in Maya is to start from tracing the image with primitive planes. It is important to use the minimum of planes (to have a low polygonal surface) at this starting stage. Later on, if needed it is always possible to multiply the polygons with the cammand “multy-cut”.

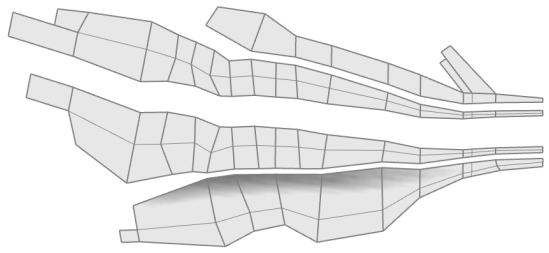
# ITERATION 01



1- Image tracing with primitive planes

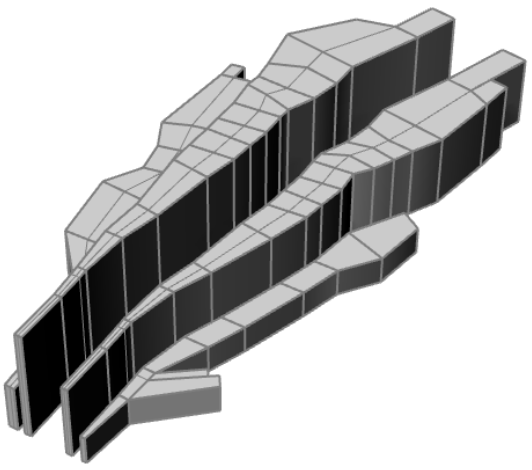


2- Separating the branches using the command “move” in order to create gaps between them.



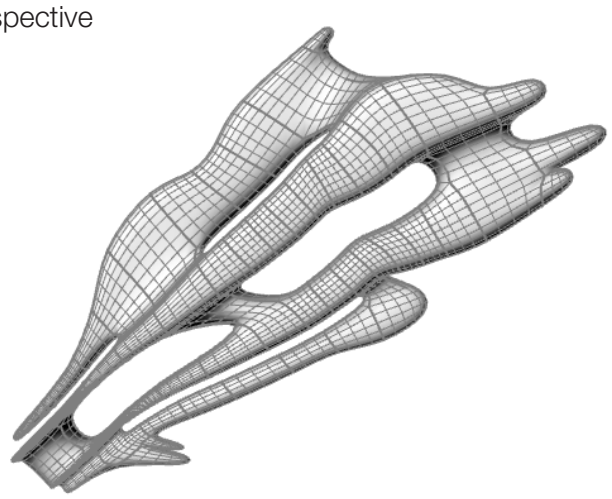
3- Emphasizing the gaps and extruding the branches in different heights.

Perspective



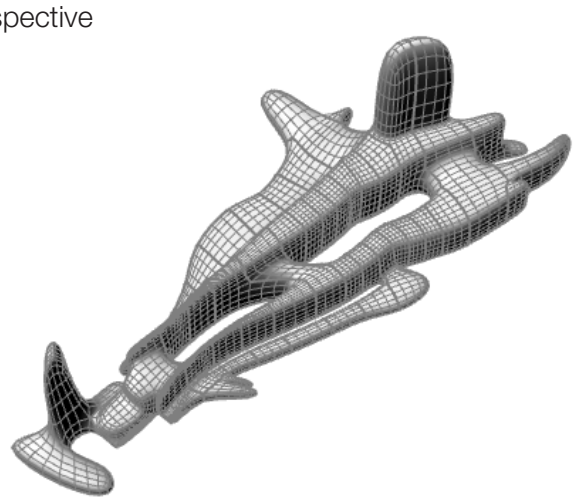
4- Perspective view of the extruded shape.

Perspective



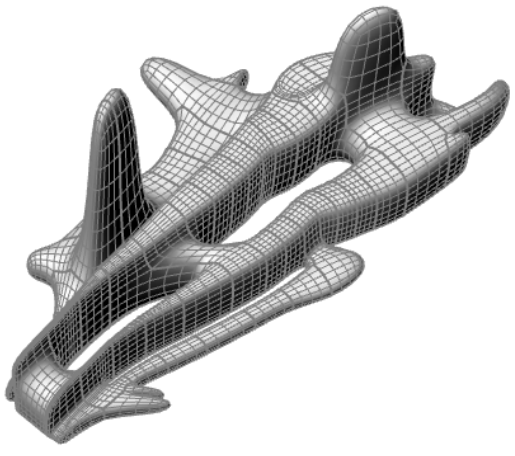
5- Creating connections between the separated branches by using the commands “combine” and “bridge”. These connections are intended to be walkways in the latest stage of the design. Maya is a software that generates soft and curvy designs. The image on the left is the same design with the upper one but in a softened and curved way.

Perspective



6- Creating vertical extrusions and designing the queue of the pavilion

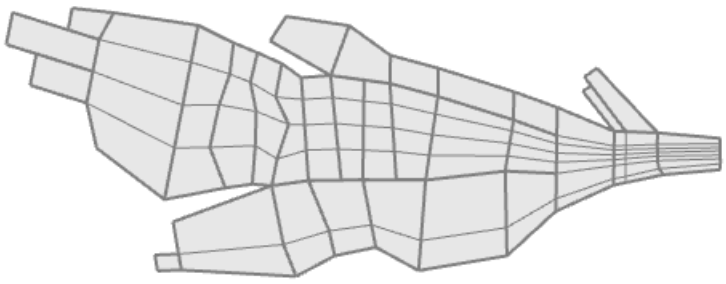
Perspective



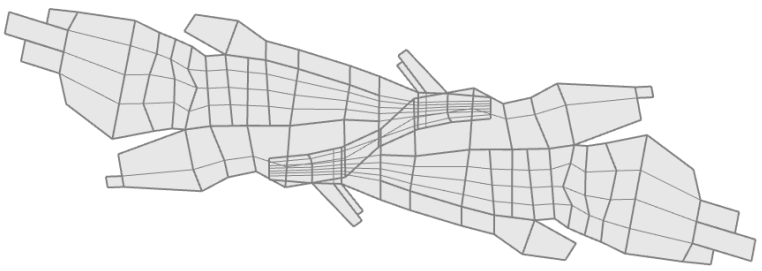
7- Going back to the previous design “5” because the queue part wasn’t matching the overall shape. Extruding other parts to get the final design of the iteration 01 series.

The second phase of the design is to take again the traced version of the image “1” and try to create a new shape by duplicating, scaling, moving, and rotating the initial shape and afterwords merging the 3D design of the previous page with the new shape.

1- Image tracing with primitive planes



2- Duplicating and mirroring

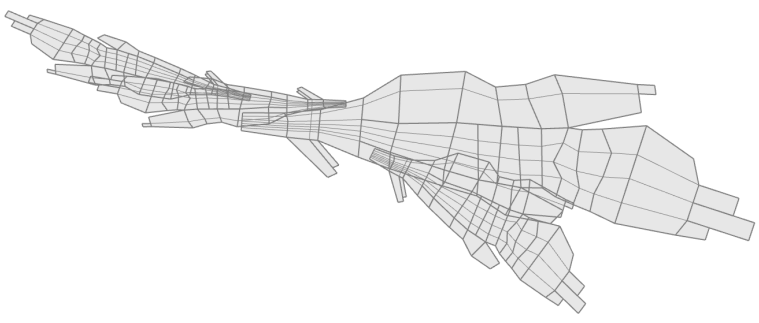


3- Duplicating and rotating

4- Scaling

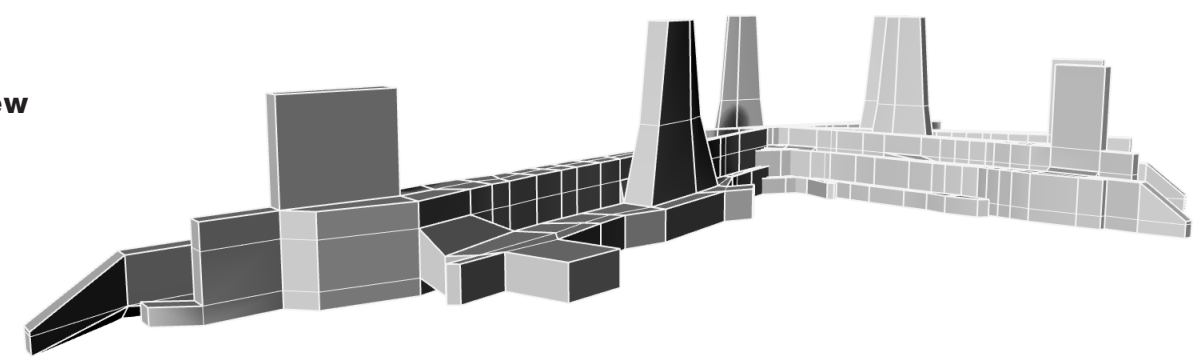



5- Scaling, rotating, and moving



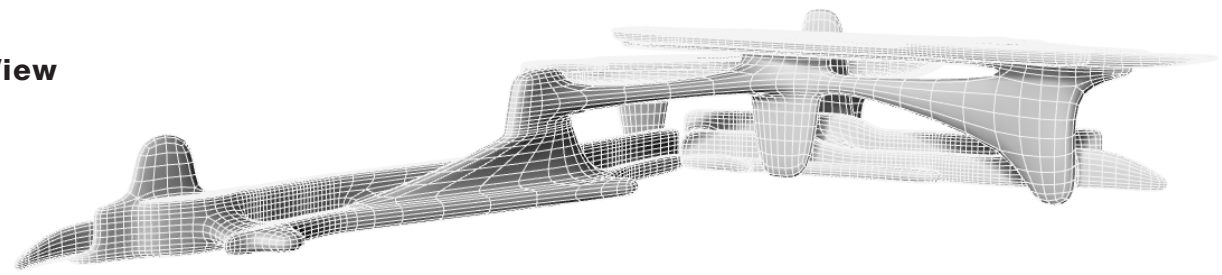
**Top View**

**Perspective View**



In this iteration, only the vertical elements are generating long but narrow shadows. This is why in the second step I introduced upper slabs in the design.

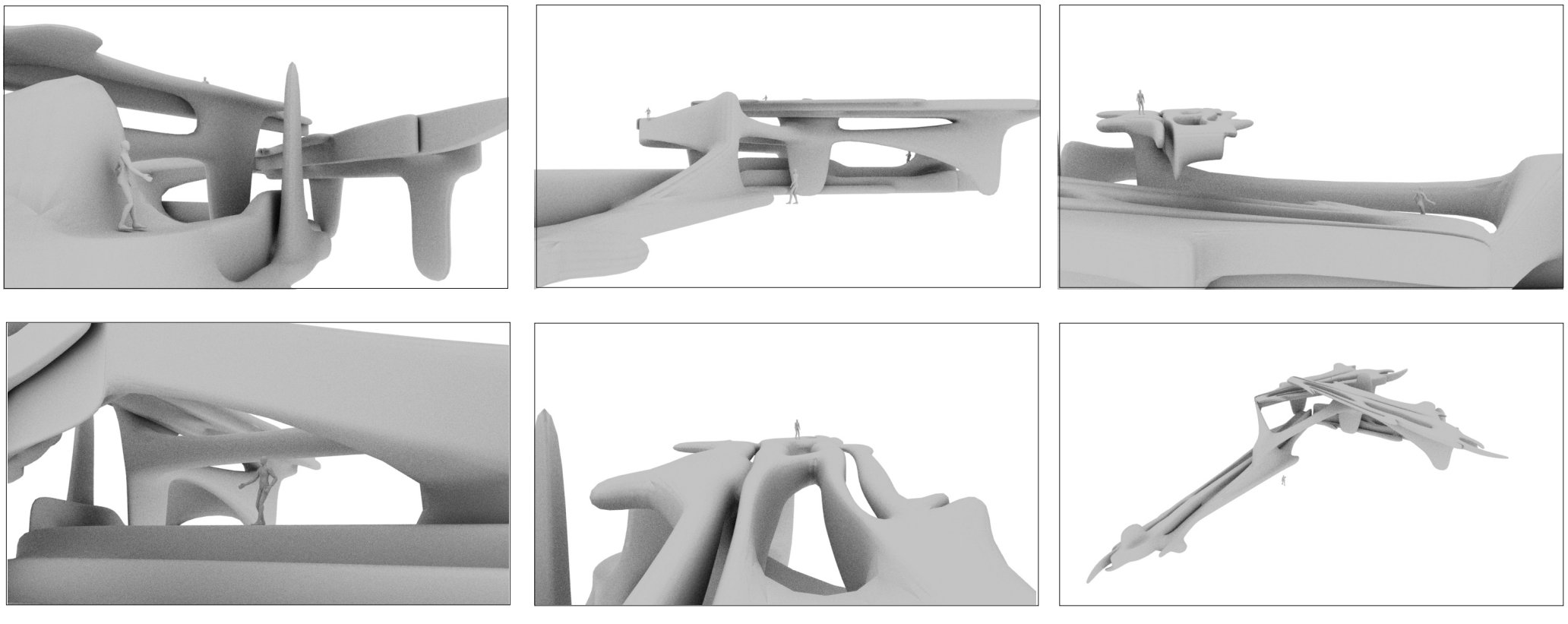
**Perspective View**



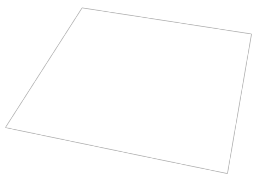
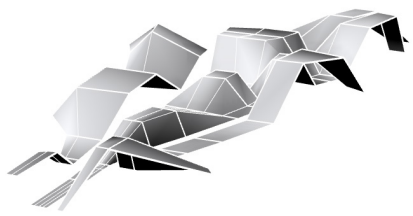
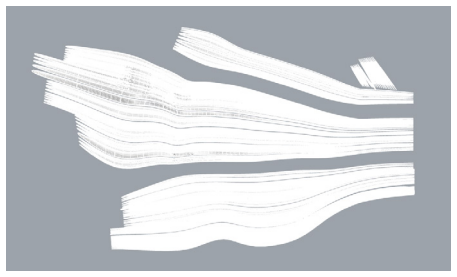
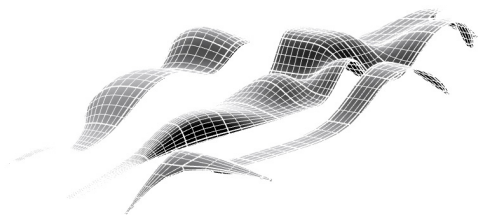
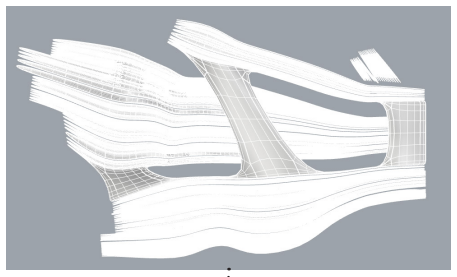
In this iteration, only the vertical elements are generating long but narrow shadows. This is why in the second step I introduced upper slabs in the design.

The outcome was missing some features of the initial image such as its materiality and the present bumps. So I decided to make another iteration series including these two elements.

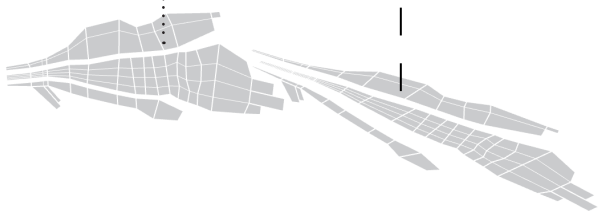
RENDERS



# ITERATION 02

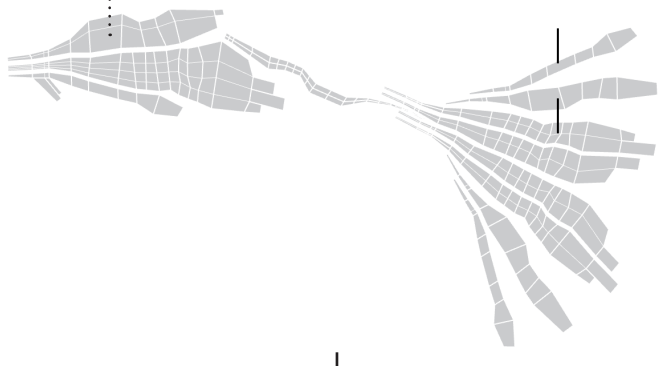
| 1- Primitive plane | 2- Including bump | 3- Including stripes |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

1



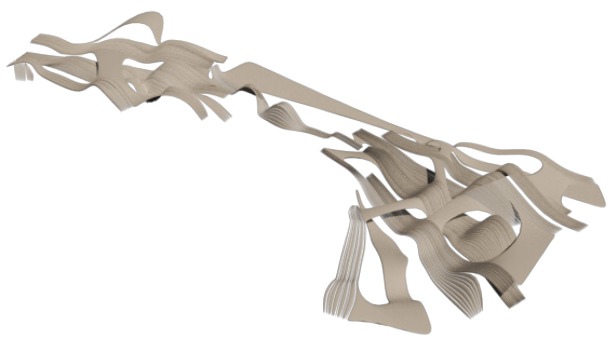
2

3

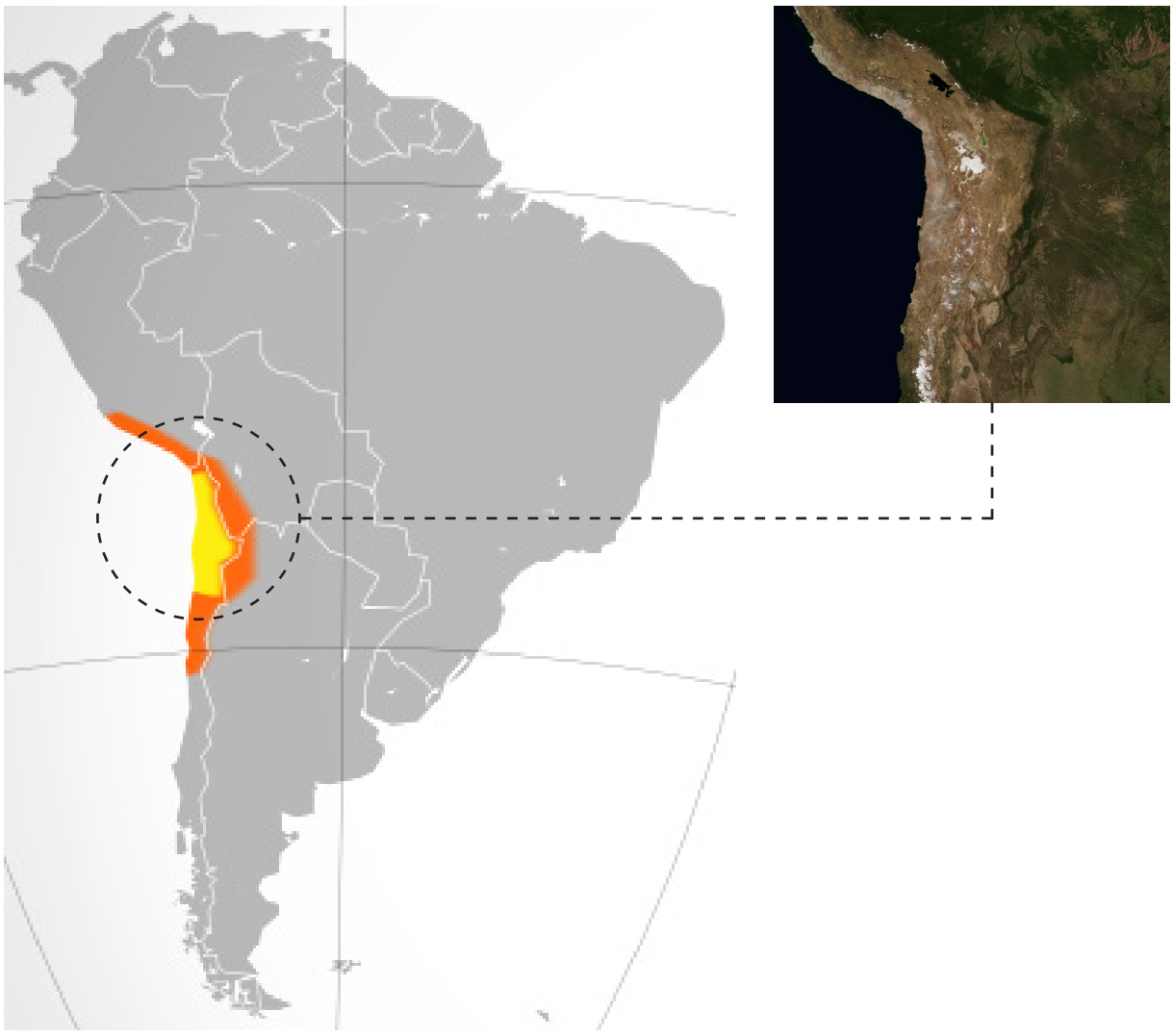


4

5



## The Atamaca Desert - Africa





https://en.wikipedia.org/wiki/Atacama_Desert

The Atacama Desert is a desert plateau in South America covering a 1,600 km strip of land on the Pacific coast, west of the Andes Mountains. The Atacama Desert is the driest nonpolar desert in the world,as well as the only true desert to receive less precipitation than the polar deserts and the largest fog desert in the world. Both regions have been used as experimentation sites on Earth for Mars expedition simulations.

**CLIMATE**

The almost total lack of precipitation is the most prominent characteristic of the Atacama Desert.

**HUMAN PRESENCE**

The Atacama is sparsely populated, with most towns located along the Pacific coast.In interior areas, oases and some valleys have been populated for millennia and were the location of the most advanced pre-Columbian societies found in Chile.

**FAUNA**

The climate of the Atacama Desert limits the number of animals living permanently in this extreme ecosystem. Some parts of the desert are so arid, no plant or animal life can survive. Outside of these extreme areas, sand-colored grasshoppers blend with pebbles on the desert floor, and beetles and their larvae provide a valuable food source in the lomas (hills). Desert wasps and butterflies can be found during the warm and humid season, especially on the lomas. Red scorpions also live in the desert.

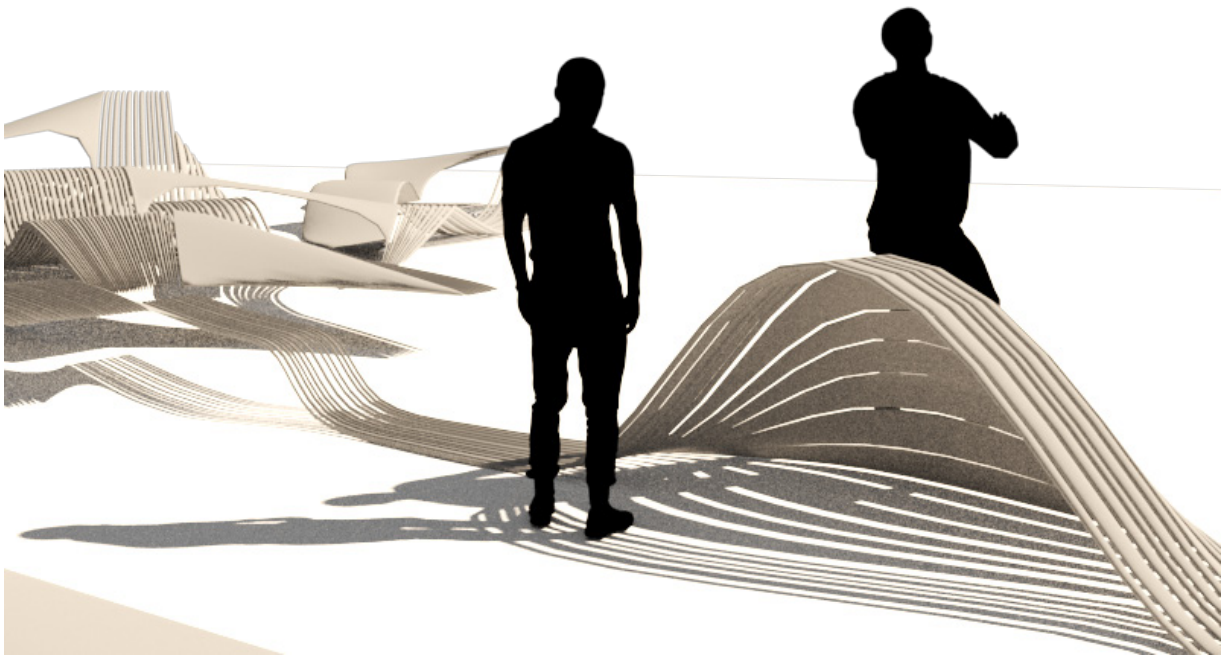
**FLORA**

In spite of the geographic and climatic conditions of the desert, a rich variety of flora has evolved there. Over 500 species have been gathered within the border of this desert. These species are characterized by their extraordinary ability to adapt to this extreme environment. Most common species are the herbs and flowers such as thyme, llareta, and saltgrass, and where humidity is sufficient, trees such as the chañar, the pimiento tree, and the leafy algarrobo.

# SCALE

In order to decide on the scale of the pavilion I tested the shadows generated by the shape of the structure at 4pm in the Atamaca Desert; the time when the shadows are the most elongated.

**Scale 1**

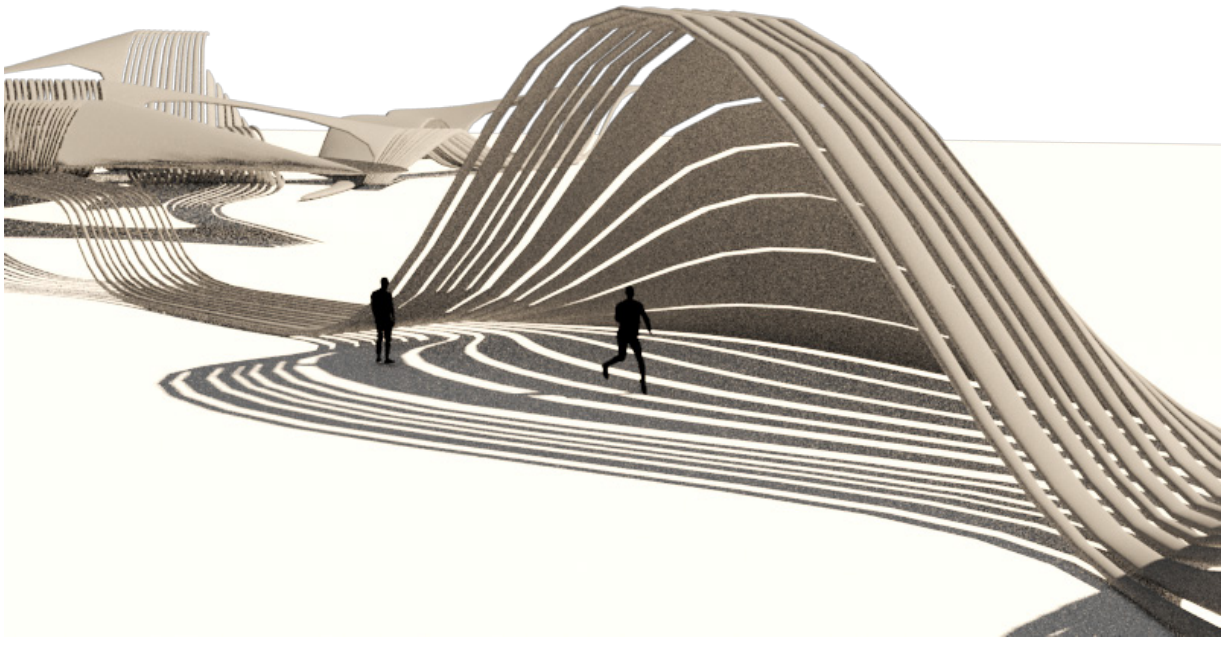


If the pavilion scale is smaller then the height of the people, it could be used as sitting spaces. However, the structure won't respond to the aim which is to generate shadows. This proposal could be adequate for a Mediterranean city where the weather permits these kind of spaces to be used. Nonetheless, sitting under the desert sun for hours without having shading can't be expected.

**Scale 2**

In the middle scale pavilion, shadows are generated and people can take advantage of them but only if they are too close to the structure. As seen in the image on the left, the person is too far from the structure and is not under shadow.

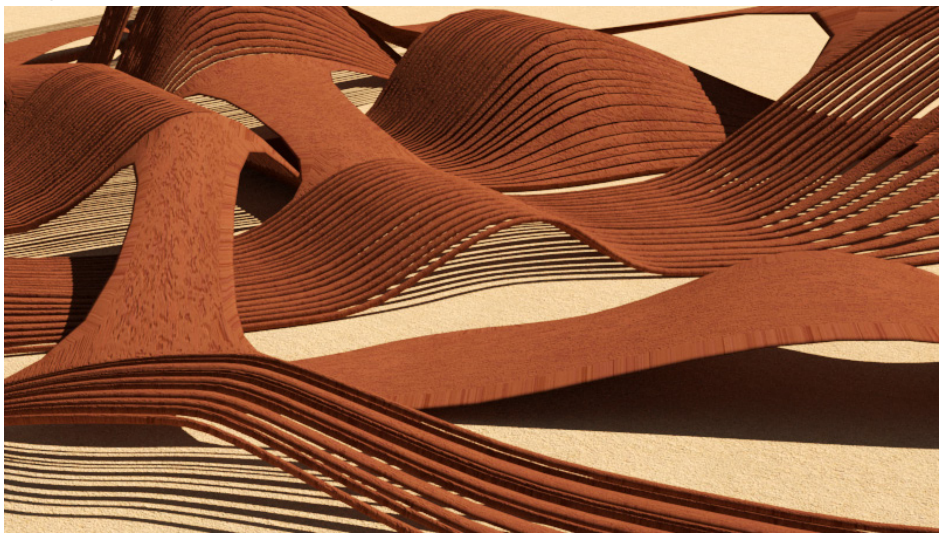
**Scale 3**



When the pavilion is big enough, the shadows begin to be wider. Thus people have more space to use that is shaded. This is the reason why, the big scale is th most appropriate one.

# MATERIAL TESTING

Clay



Clay is a material that would match the surrounding context. Nevertheless, it is a really fragile material. Thus, clay is not adequate for the making of the thin curved stripes.

Chrome metal

Using metal would be an easy way to make the pavilion since molding metal in any shape is a commonly used technique. However, metal wouldn’t match the surrounding natural environment. Furthermore, under the desert sun metal would heat extremely and the aim of the pavilion which is to keep the space under shadow and cool wouldn’t be achieve.

Glass

Glass is a very elegant material to use in the desert since it would allow a full harmonization of the pavilion with its surrounding as it is transparent and would visually merge with sand and create an optical illusion of showing small sand dunes. However, glass would create greenhouse effect and make the space even hotter.

Concrete

Even though white concrete would look nice in the middle of the desert, it would heat too much and the making process of the stripes would probably be very difficult.

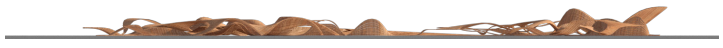
Wood

Finally, wood and bamboo are malleable materials when left in the water during a few days. Its texture and color would match the surrounding. Moreover, wood is a good material that doesn’t heat easily under sun and generates the necessary amount of shadow.

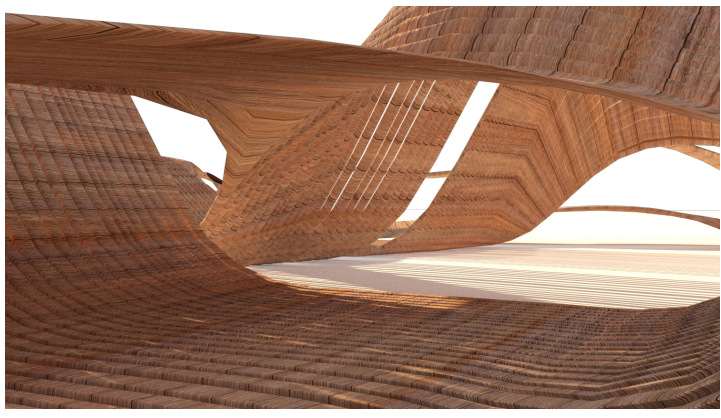
# VIEW TESTING FOR RENDERS

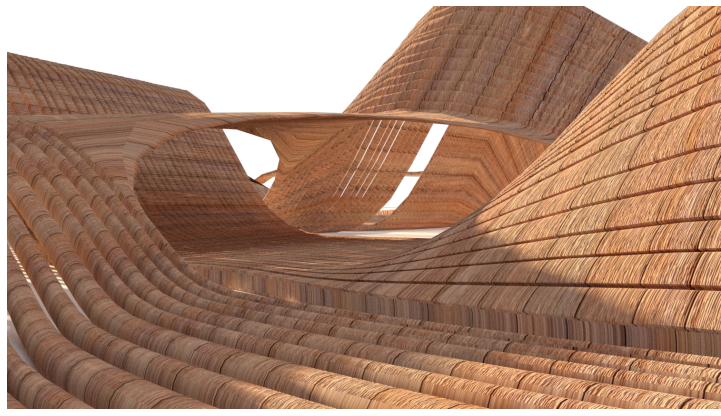
**Top view**

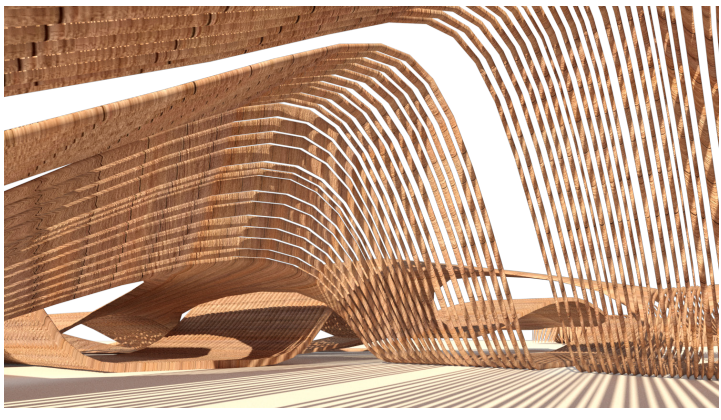
**Elevation**



**Interior view**



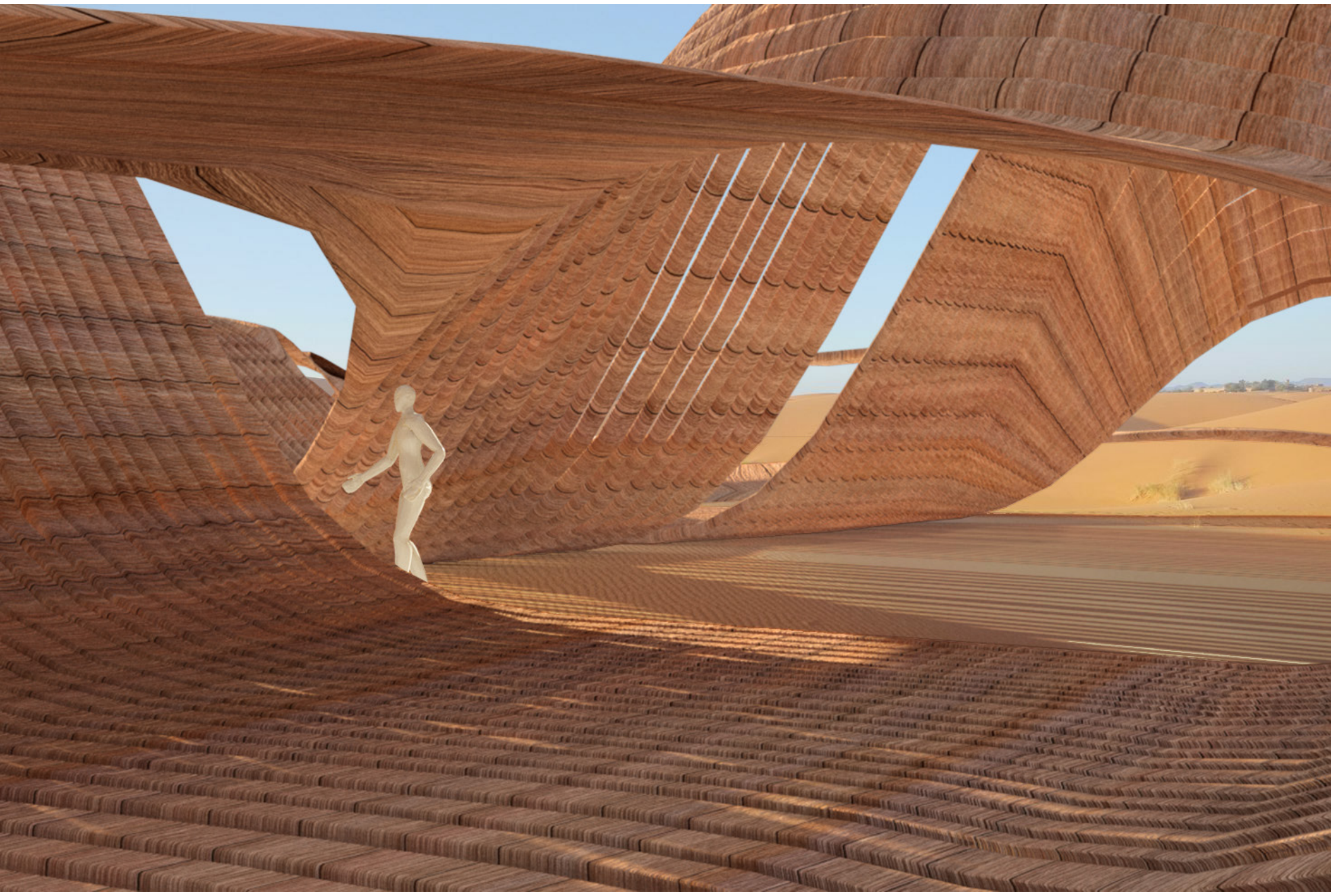




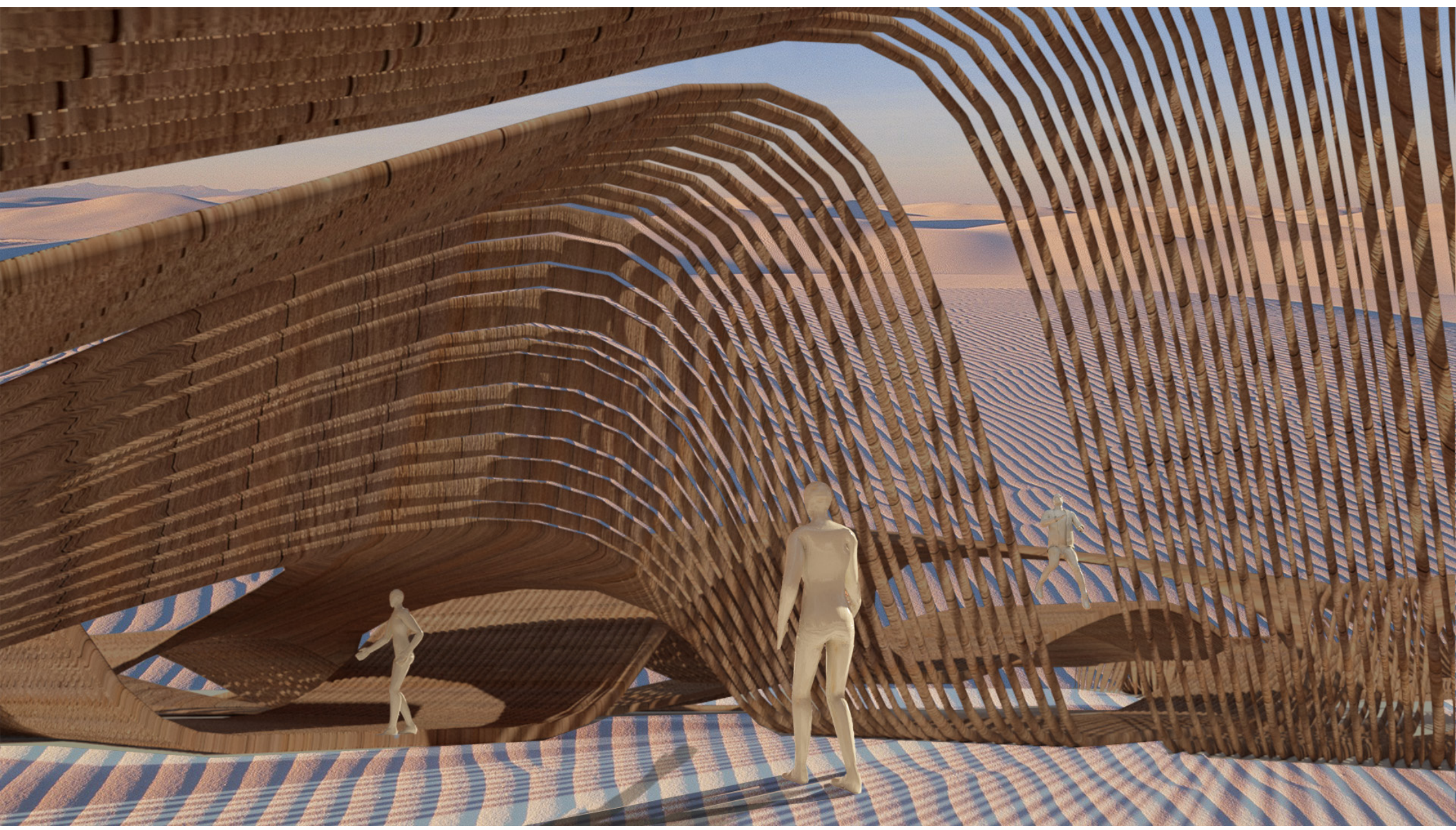
Top view render

Elevation render 02

Noon time interior render



Evening time interior render



The renders are showing the diverse atmospheres the pavilion is creating. On one hand, it is a relaxing space during the day and on the other hand, the space becomes a psychedelic environment, produced by the merging of shadows and the blue evening sky. The peaceful and quite place is an inviting structure for the people living in the Atamaca Desert. The pavilion can host different events such as big gatherings. The top view conveys the idea that the pavilion is a spider-like structure that thrives to dominate the immense and extensive desert.