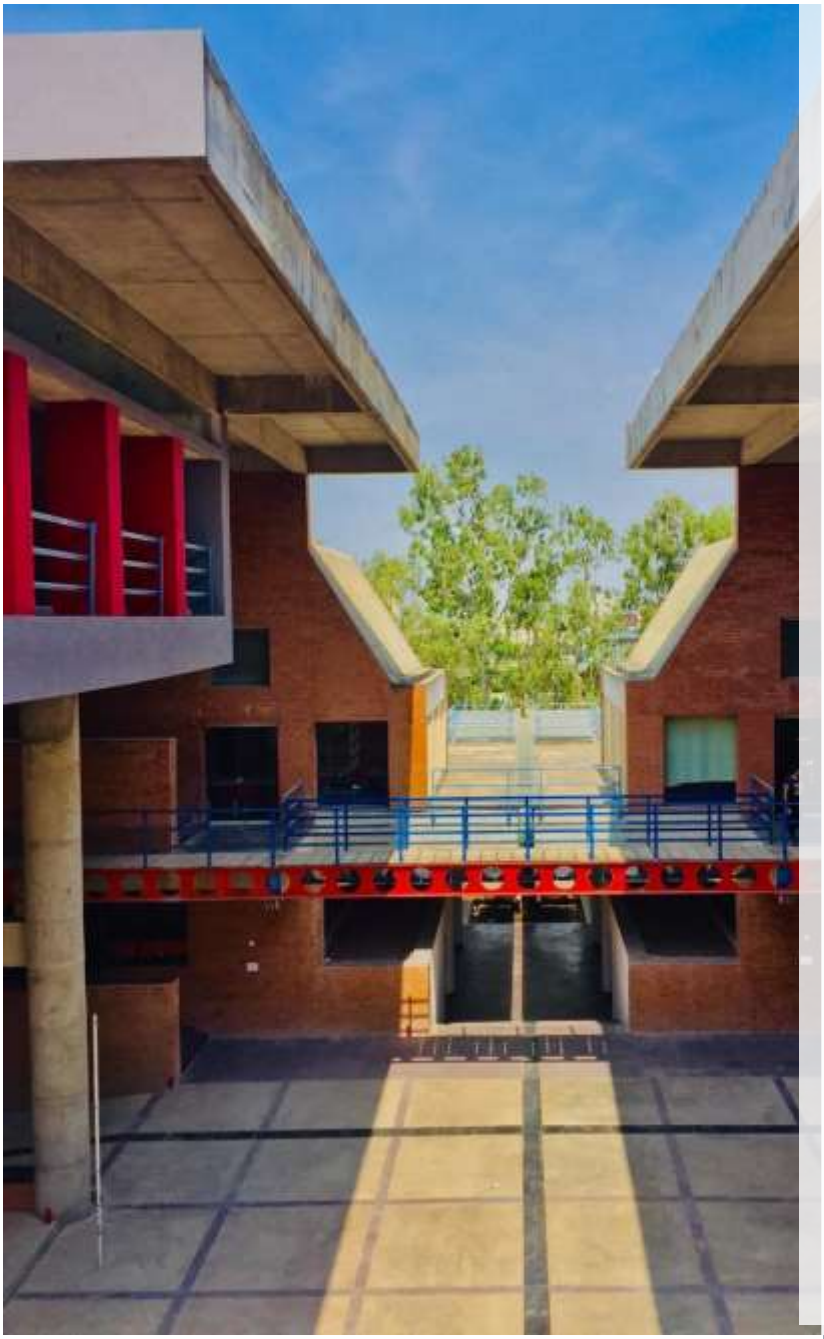


Collaborative Activity with CumiLab

Academic year 2022-23

Ar. Bhairumal Sutar of Cumi Lab

and

S.M.E.F'S Brick School of Architecture

3/05/2023

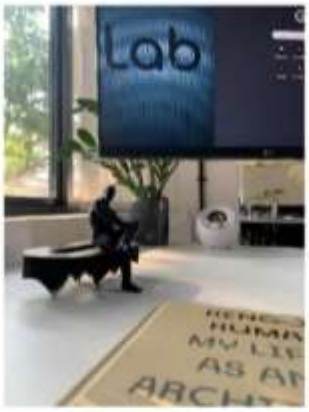
ELECTIVE - IV

Prototyping Studio - A Cumilab Elective

1. Product Design and architecture
2. Lighting design

Prototyping elective report

By Jissella Maria A12



Introduction

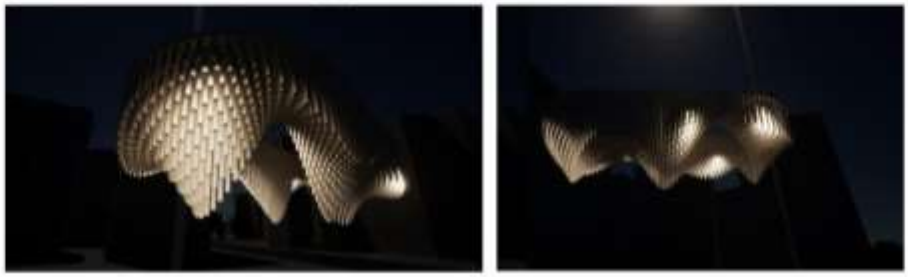
The aim of the elective was to get a hands-on experience in the process of designing and prototyping a simple functional project. By designing and building a lamp prototype, we learnt how to develop a concept, refine it through various iterations, create a working prototype and test and refine it. During this process we learnt about different materials and techniques involved to make a lamp prototype.

Day 1

We discussed the design of the lamp of the lamp with sir. During our discussion, we reviewed the evolution of the lamp prototype and its specification such as size, material and form. The chosen design of the lamp allowed us to explore a variety of materials and techniques simultaneously.

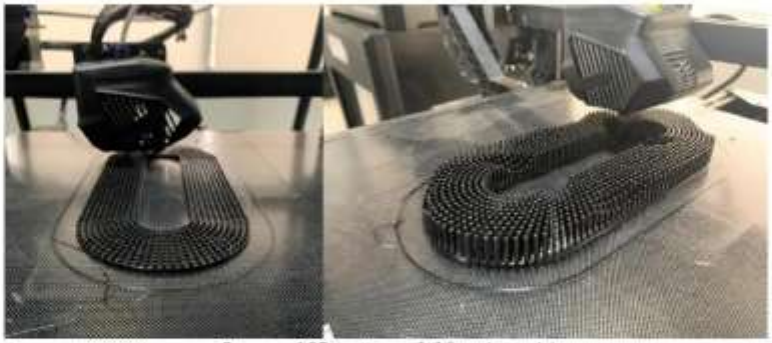
Design of the prototype

Additionally, we were asked to propose different lighting options for the lamp, specifying the light specification and the hardware materials required for the lighting. The final lighting option chosen was to position the lights at the top end of the pipe, with light becoming more diffuse as the pipe lengthens, and more intense as the pipe shortens.



Lighting option proposed by our group (emphasizing the layers of the lamp)

Following this, a 1:10 scale model of the lamp was 3D printed in the studio. We were given an explanation of the 3D printing process, including the initial steps required, the softwares used, the materials involved, and how a 3D printer works.



Process of 3D printing a 1:10 scale model

After that, the lamp prototype's MDF board base was sent to a nearby workshop for CNC cutting, while the pipes required for the prototype were sent for powder coating. We visited the CNC cutting workshop, where we documented the CNC cutting process and were given an explanation about the process.

CNC cutting process for the MDF board base

Day 2

We received the necessary materials for the lamp, including 16mm diameter aluminium pipes that had been powder-coated in black colour, as well as the MDF base with CNC cuts to accommodate the pipes. When we tried to insert the pipes into the MDF board, we found that it was a tight fit, so we were asked to sand the holes to better accommodate the pipes.

Testing the holes of the MDF base

Sanding the holes of the MDF base

A plan of the design was printed mentioning the heights of the pipe for reference while cutting the pipes. We were first given spare aluminium pipes to test cut, so that we don't damage the powder coating of the actual pipes. In this step, it was important to calculate the number of parts we could get from one pipe so as to reduce the amount of wastage.

MDF board placed on the plan to check if the cutting has been executed accurately

The students were divided into 5 groups. One group was tasked with preparing the base, while another was responsible for executing the lighting of the lamp. The remaining three groups were responsible for cutting the pipes for assembly. The base preparation group, after sanding the board, was required to paint the base in grey water-based paint to match the ceiling colour of the studio.

Measuring of the pipe

Cutting of the pipe

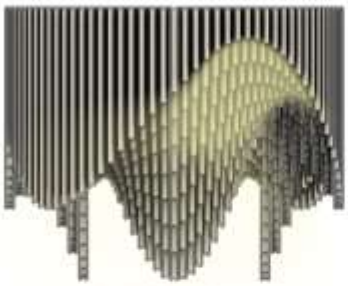
Day 3

Despite working on the prototype for three days, we were unable to complete it, but we were now aware about the challenges that may arise during the design and prototyping process, such as material selection, hardware requirement, fabrication techniques, etc. Approximately a week later, we revisited the studio to document the lamp's progress, which was then 50% complete.

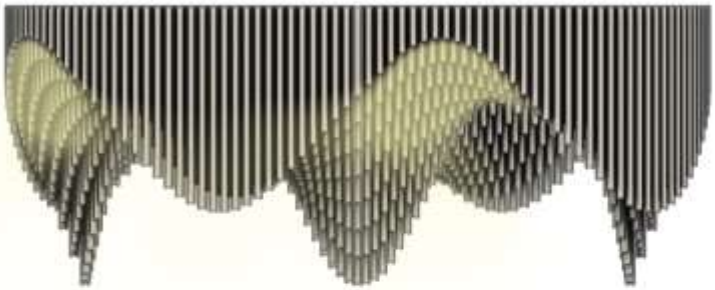
1:10 scale model of the prototype

Lamp prototype at 50% completion

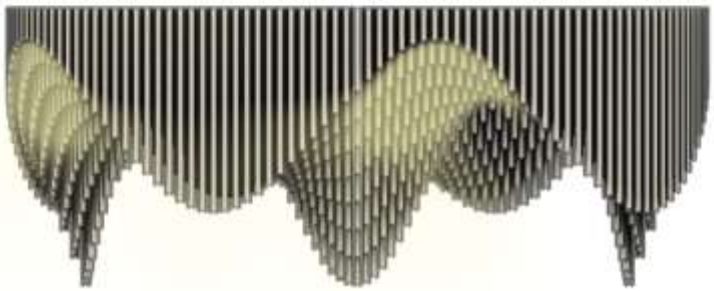
CumiLamp



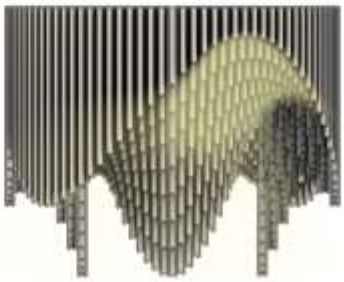
Front Elevation



Left Elevation



Right Elevation



Back Elevation

Views of the Model

Hardware specification

Small flashlight light bulb

Brand- Tehaux
Type: LED
Voltage: 905 volts
Bulb base: E10
Dimension: 1cm x 1cm x 2cm
Finish type: Chrome glass
Number of bulbs: 4

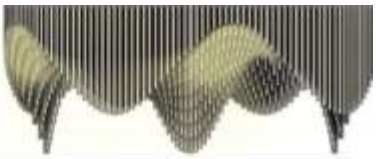
Light fixture consideration

The main ojective of this design of light fixture was to emphasize the open layers of the cumilamp. To achieve that effect, a single small LED bulb is fitted inside the topmost pipe of the outermost layer.
We minimised the use of light as the space is already well lit. We have focused more on attrcating the eyes of the visitors towards the CumiLamp.

Jissella Maria Karishma Rawool Sanjana Kotacha Vishal Bindhu Akash Walke

PROTOTYPE ELECTIVE

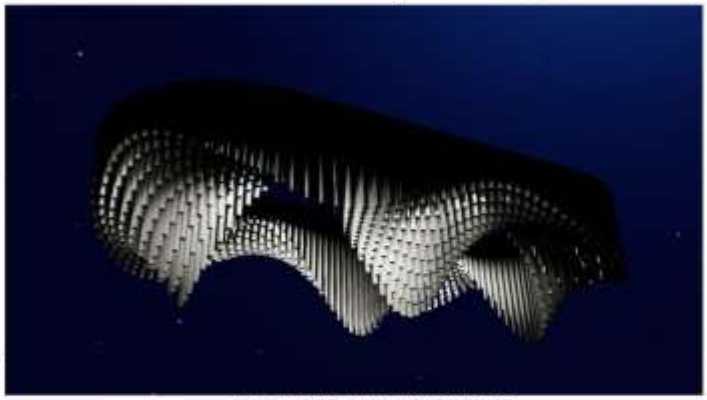
CUMI-LAMP :
A PROTOTYPE



The lamp that was designed for CumiLab studio's entrance was created using advanced parametric design techniques, which involved using Rhino and Grasshopper software. The designers were able to precisely determine the lamp's size, shape, and material using this software, which resulted in an efficient production process and an accurately executed final product.

The lamp's design is sleek and modern, featuring powder-coated aluminum pipes and an MDF board base. The designers intentionally left the interior aluminum pipes uncoated to enhance the reflection of the light. Overall, the use of parametric design allowed for a highly precise and aesthetically pleasing final product.

Overall, the lamp's use of parametric design highlights the benefits of using computational tools in the design process. By leveraging these advanced techniques, designers created highly precise and aesthetically pleasing products that would have been difficult to achieve using traditional design methods.



FINAL MODEL WITH LIGHT FIXTURE

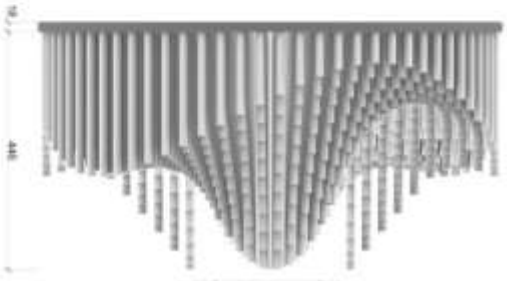
HUMAN SCALE WITH THE PROTOTYPE

FINAL MODEL WITH LIGHT FIXTURE

PLAN

ON-SITE MODEL

LEFT ELEVATION



RIGHT ELEVATION

Material used :

Powder coated Aluminum Pipes

Material: Aluminum
Diameter: 16mm
No. of pipes: 1250

MDF Board

Material: Wood fiber
Dimensions: 865mm X 1860mm
Finish type: Matte
No. of MDF Boards: 1

Small flashlight light bulb

Brand: Tehaux
Type: LED
Voltage: 905 volts
Bulb base: E10
Dimension: 1cm x 1cm x 2cm
Finish type: Chrome glass
Number of bulbs: 4

Copper wire

Material: Copper
Length: 10m
Color: Black

Karishma Rawool Sanjana Kotecha Jissella Maria Vishal Bindhu

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