DESIGN PORTFOLIO

Mobile Entities- Exactly AI

NOA GUY • Architect • Computational Design • 3D Artist • Noaguy8@gmail.com • noaguy@aaschool.ac.uk • https://www.noaguy8.com/

Table Of Contents

1. AADRL, Transcend, Thesis Project

- Ergonomics
- Minimal Space
- Shape Shifting Unit
- Mobility
- Collective

2. Computational Design

Mobile Entities- AI
Popoulous- Experience Studios- Generative Design
HOTF- UE05

3. Projects-

- Heatherwick Studio- XIAN
- YGAA - Balady, Mixed-use Tower
- YGAA - Hareches, Hotel, Commercial and Residential
- YGAA- SIASUN

6. Digital Fabrication

- Collection of 3d modeling and prototiping techniques

NOA GUY • Architect • Computational Design • 3D Artist • Noaguy8@gmail.com • noaguy@aaschool.ac.uk • https://www.noaguy8.com/

Mobile Entities- #49C | Mobile Detroit 2050

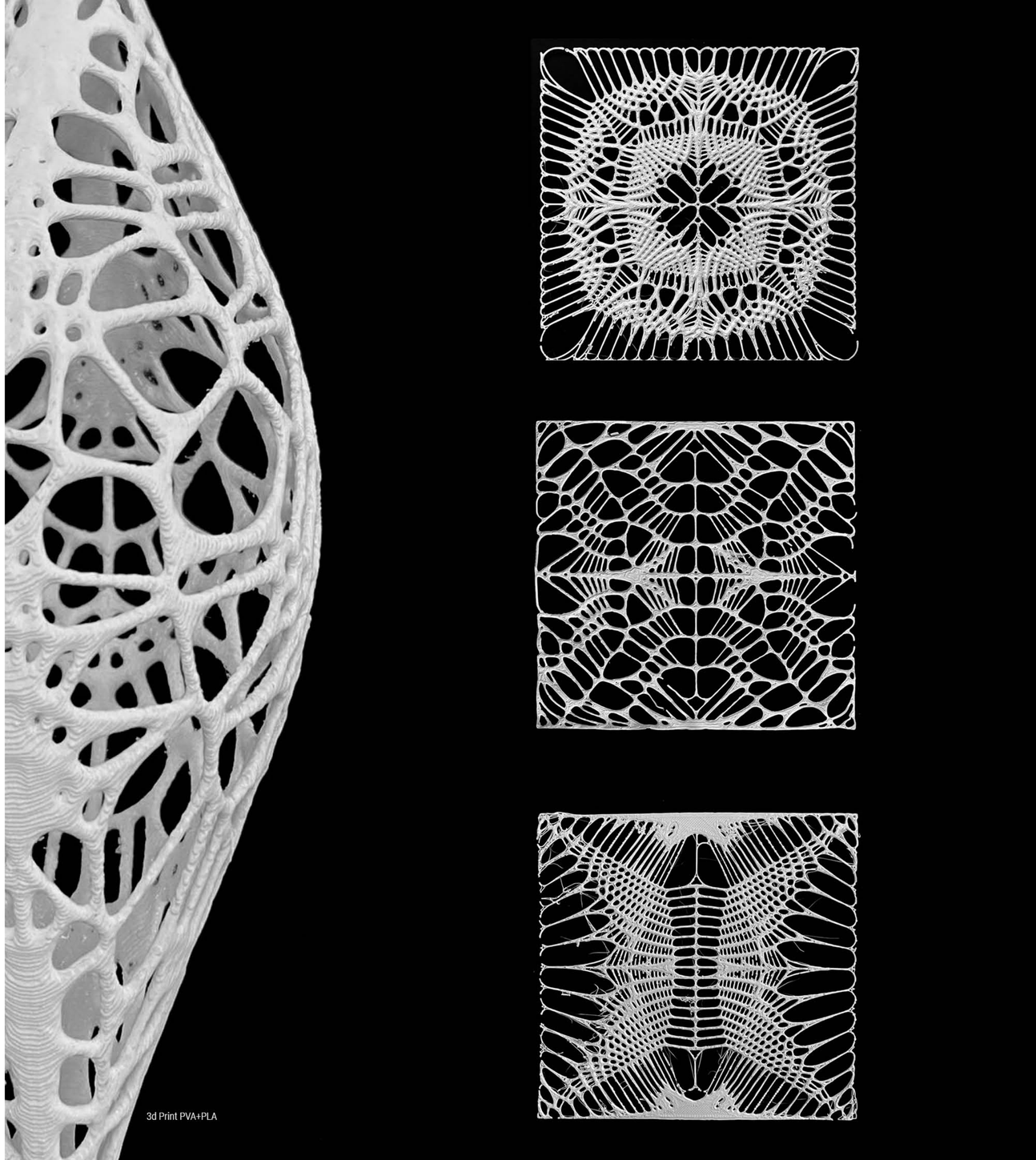
AADRL | TRANSCEND

Thesis Project- AADRL

The proposal revolves around the exploration of a hybrid design space at the intersection of mobility and liveability, favouring a multidisciplinary approach across the fields of architecture, automotive, and aerospace.
It is contextualized on a projection of a near-future of emergent concerns around humanity's ecological footprint, where population is rapidly expanding and cities are becoming over-saturated, raising the need for new strategies towards provision of space and resources.
We tackle those concerns by looking at mobile liveability as a means of detachment from the traditional rigid urban infrastructure. With that, the goal is to achieve an adaptive architecture as a self-sufficient system of a soft-infrastructure.
Our explorations start from the notion of minimal spatiality with a particular attention to proxemics and ergonomics, and the dialogue between the human body and its immediate surroundings. Those ideas translate spatially by looking at programmatic overlays, reactive surfaces, and transformable functionalities within the minimal space.
This minimal space is encompassed at the scale of a "macro-suit" or a "micro-architecture" as an apparatus that extends from the human body, able to shape-shift in response to different environmental and functional conditions, enabled by the actuation of deployable structural systems and flexible materiality.
The goal of this transformational capability is the adaptation to hybrid environments within which the system is contextualized. The units engage in on-ground and in-air mobility as an emphasis on the notion of a resilient, off-grid, and migratory form of living. With that said, we look at gliding as an energy-efficient medium of a passive mobility, through which energy harvesting is enabled as the system is directed by the dynamic rhythms and flows of nature.
The aim of mobility, in this context, is not limited only to achieving resilient living, but also, to open new horizons of opportunities in transportation that allows temporary settlements in desirable inhabited locations, augmenting the relationship between humanity and nature. Architecture, in that sense, becomes ephemeral, engaging in an interplay between human presence and the intact natural environment.

Transcend Team Members-

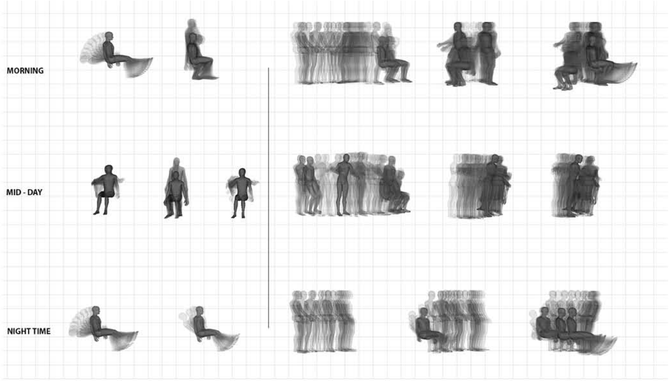
Noa Guy, Karim Hallak , India Baz, Behice Ozer, Yujie Wang

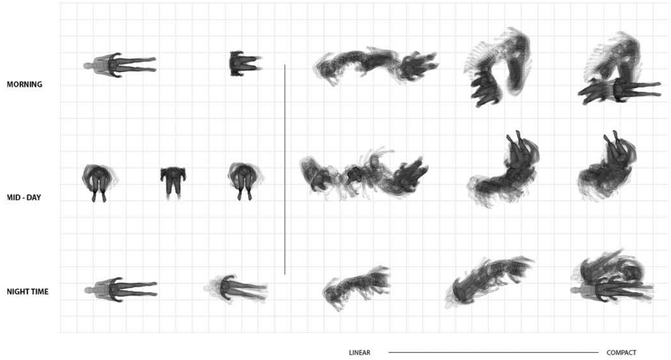


On Ground, Unit Moibile Mode
Visualization- Rhino & Vray

On Ground, Cliff Take-Off Location

Visualization- Unreal Engine 5, Modeling- Rhino & Maya





Linear to compact space usage

Linear to compact space usage

On Air | On Ground | Extended Living

Chair | Single Bed | Double Bed

Bed | Lounge | Sitting

Soft Areas: Chair to Bed

Transformation Sequence

Main Rotating Element

Table / Storage

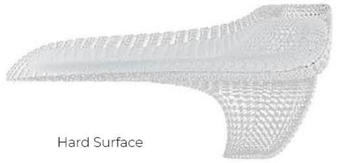
Living Mode

The subdivided areas provide interplays of soft and hard surfaces according to their function. To change between different functions the pieces are sliding through the slits from the floor and the adjacent surfaces. Enabling multi-use scenarios in different modes.

Soft Surface

Hard Surface

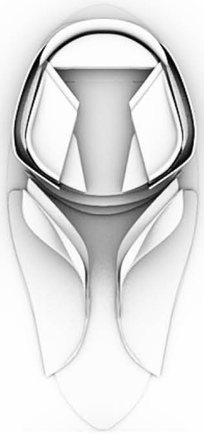
Soft Surface



Hard Surface

Shape Shiftting- Abstract Studies

Expanded



On Ground

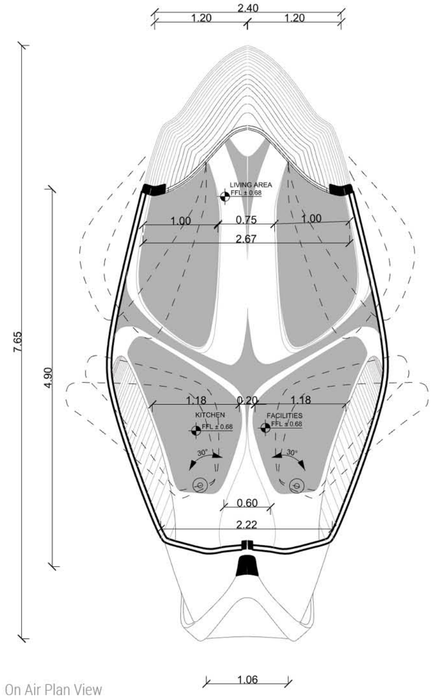
On Air

Expanded

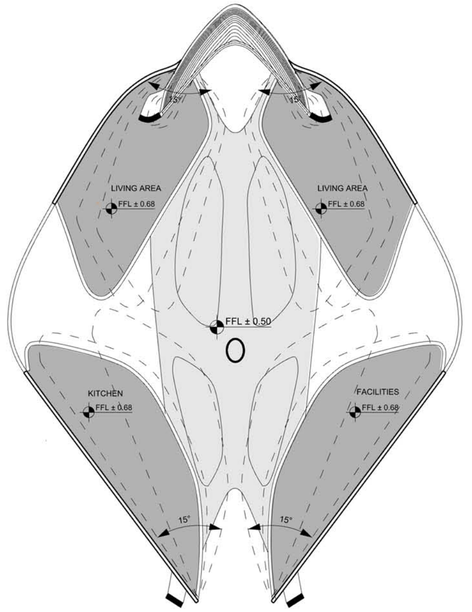
On Ground

On Air

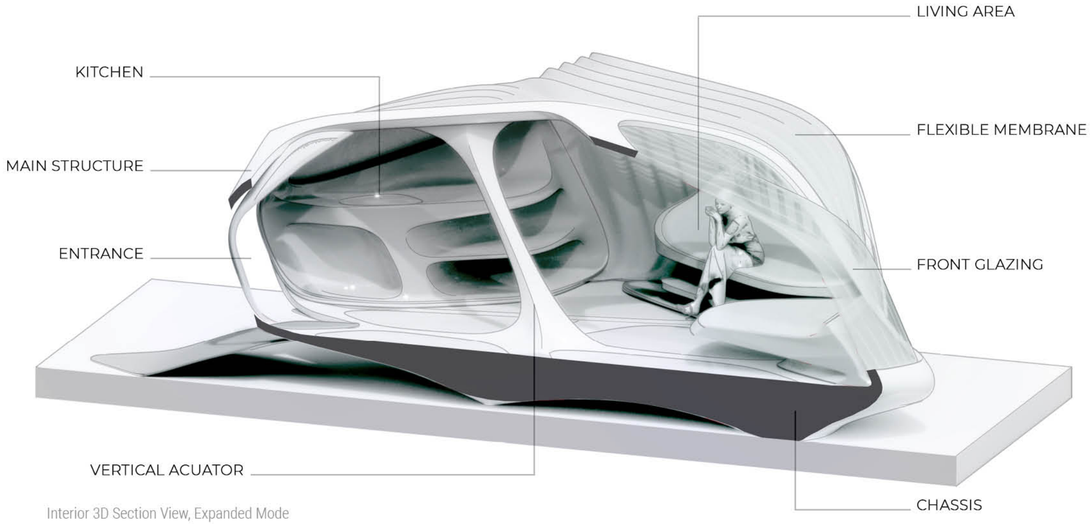
Interior Design Configurations- Rotational Mechanism



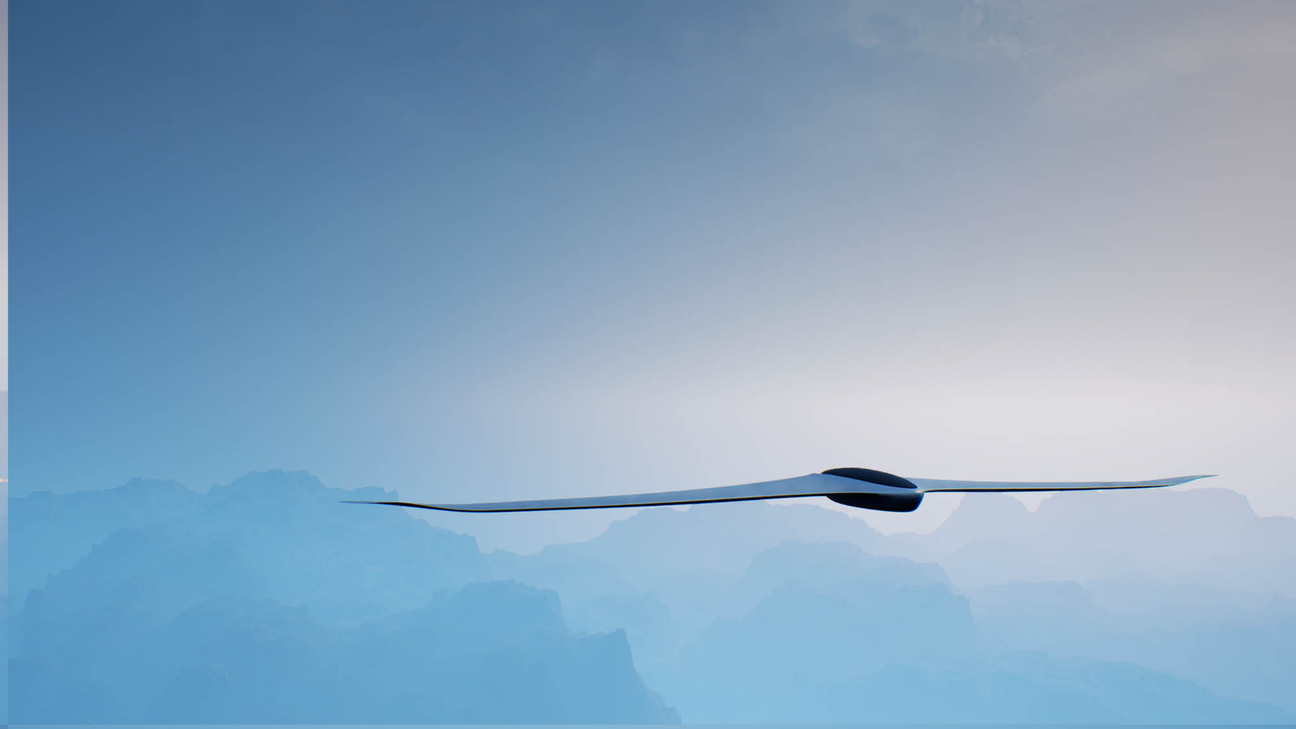
On Air Plan View



Expanded mode On Ground Plan View



Interior 3D Section View, Expanded Mode



Air to Ground Transformation- Animation Sequence

Visualization- Unreal Engine 5, Modeling- Rhino & Maya

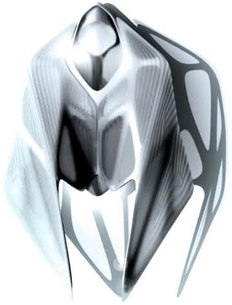
Unit Transformation

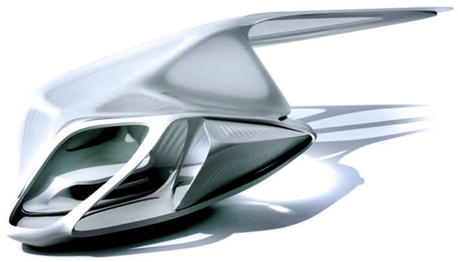
Compressed - Mobile

Expanded - Stationary

Vertical Expansion

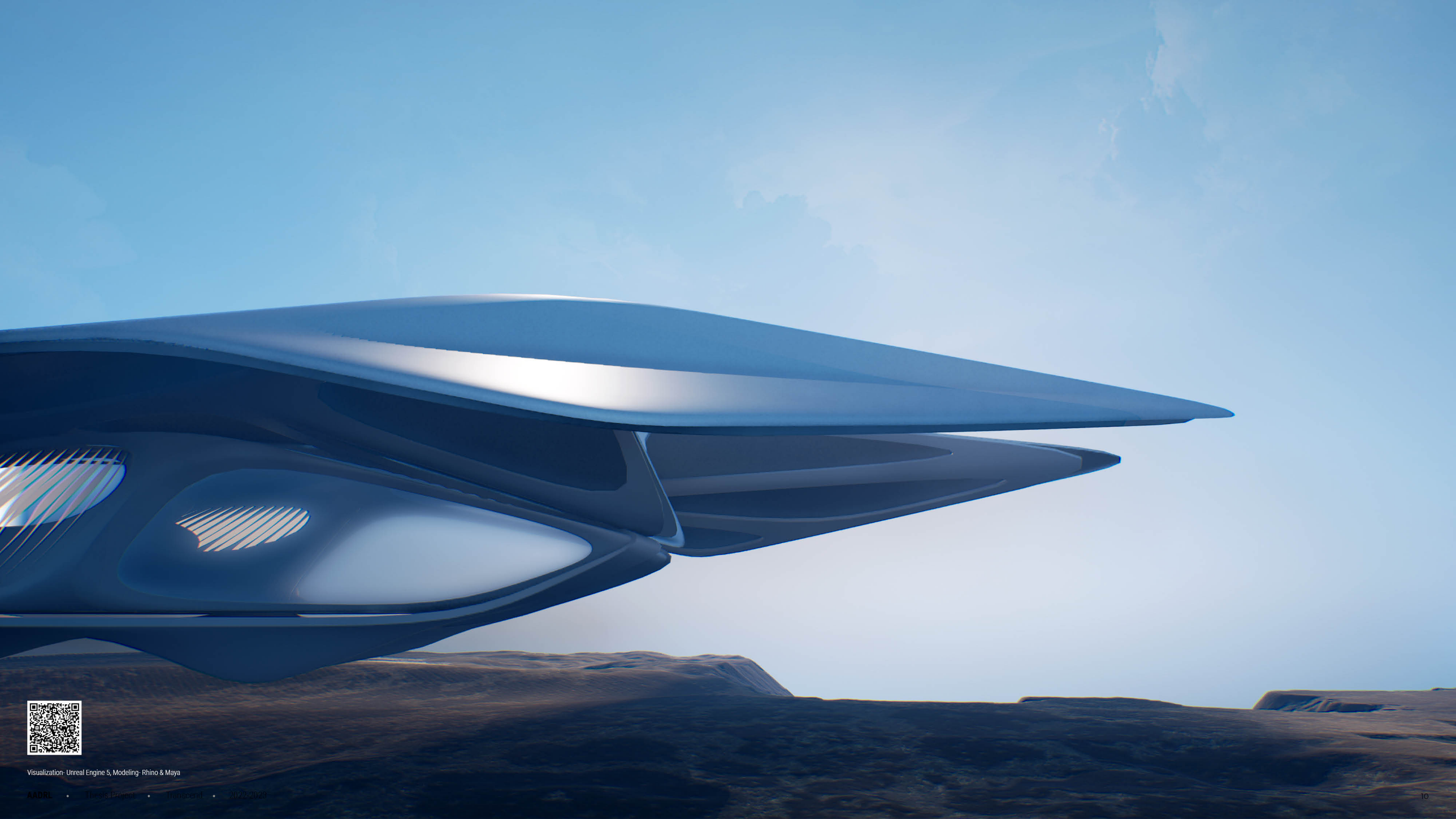
Lateral Rotation





In Air Mobility

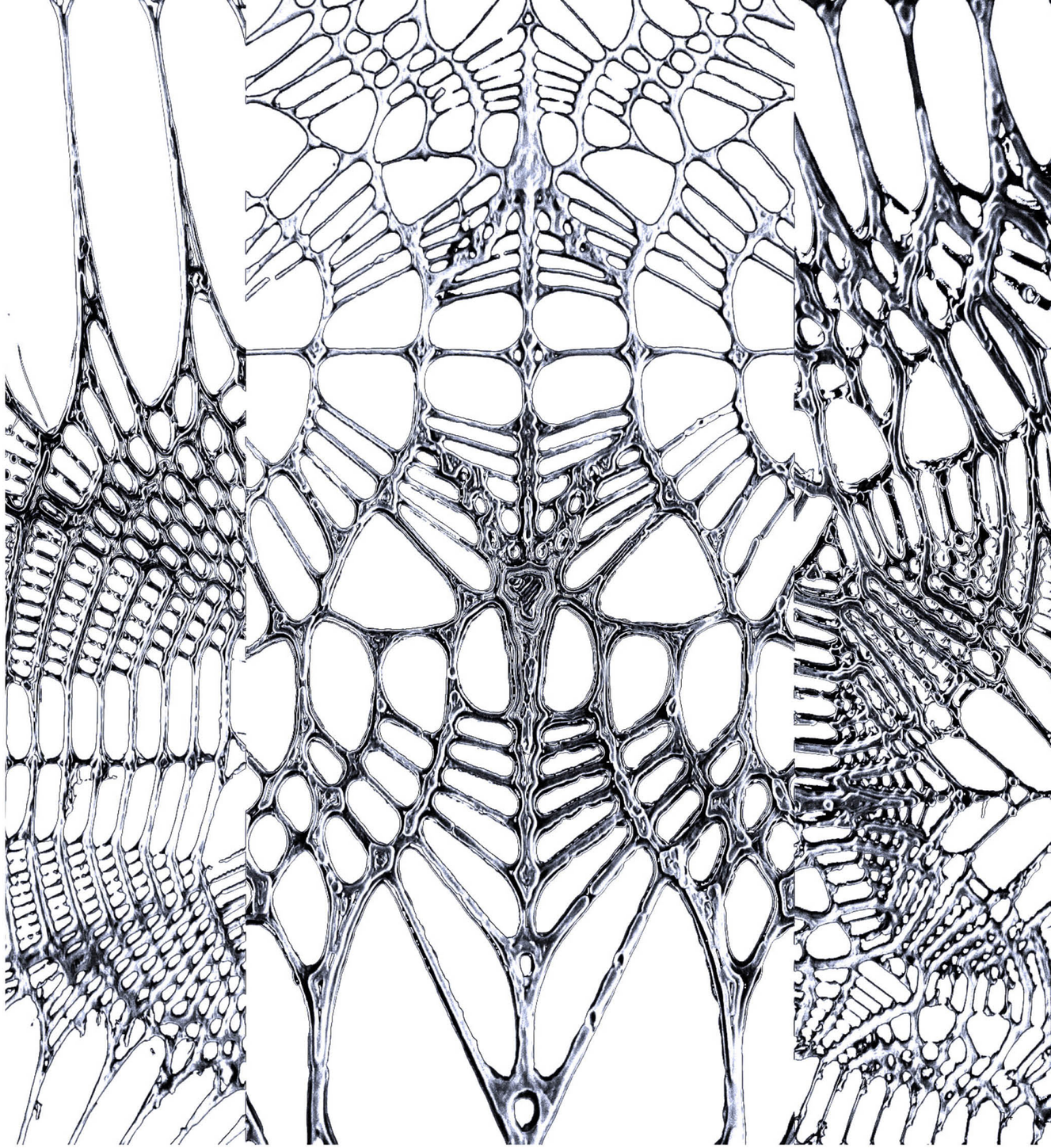
On Ground Mobility



Visualization- Unreal Engine 5, Modeling- Rhino & Maya

Computational Design

Design Development using adavanced computational design tools such as- Unreal engine 5, GH rhino and Maya and AI multiple interfaces. Creating parametric workflows for varied projects according to diverse design breifs. Nowadays, I'm exploring generative tools and real time visualizations algorithms in cross disciplines as a multidisciplinary designer and a 3d artist.



AI | Mobile Entities

Mobile Detroit 2050

The proposal discusses an innovative approach to our mobile patterns in a significant shift in how the automotive and aviation industries transform into a more ingenious system emphasizing Energy efficient and holistic way of living. Various innovations in the industry have given rise to endless possibilities at the intersection of mobility and lifestyle using various technological opportunities.

My proposition is an ecology of mobile entities, emphasizing optimization using adaptable skins and transformable functions that create a taxonomy of objects designed to air, ground, and water according to the user's needs.

Today people walk around with a family of devices that serve their uses in different realms. For example, Apple mastered this concept of a well-designed kit of instruments that shares the same aesthetics, information, and interface. Imagine we can control a small drone that we release from our car while standing in traffic to do the rest of our daily tasks, and it will know from our navigation system when You will arrive home and unpack. This harmonious and simultaneous method can revolutionize how the automotive and aviation industries should adapt to different lifestyles and daily patterns.

The design methodology of the entities focuses on their lightness, self-sufficiency, and Energy efficient logic. This transformational capability's goal is adapting to hybrid environments with different climatic conditions. The unique skin can embed cells of solar panels while folded and not in use or open to enable airflow and reduce energy consumption.

The proposal revolves around an exciting future for the mobility industry, looking for technological innovations on the one hand and, on the other hand, learning from natural phenomena such as lightweight elements for flight, defining complex membranes to preserve Energy and compact ability and adaptivity for various environments.

Mobile Entities- A series of experiments designing lightweight structural mobile entities such as drones and small rovers inspired by nature and the human body.

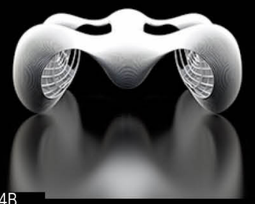
Generative Design • Computation • AI • UE05 • 2023

#01A

#05A

#09A

#15A


#04B

#14B

#25B

#34B

#09C

#17C

#45C

#49C

#02D

#05D

#12D

#19D

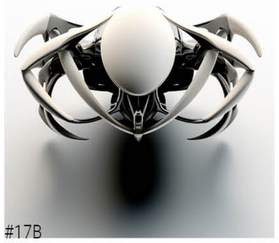
#03A

#06A

#12A

#14A

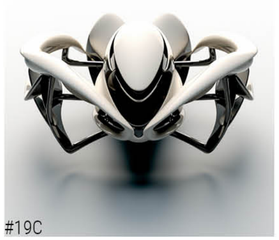
#01B


#17B

#28B

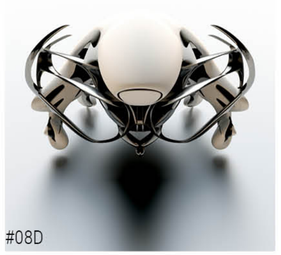
#37B

#15C


#19C

#33C

#42C


#08D

#09D

#15D

#19D

A series of experiments designing lightweight structural mobile entities such as drones and small rovers inspired by nature and the human body. This series is documented in order to challenge and learn from an input-output workflow using AI generative tools. The main inspiration is the pelvic bone, a solid yet flexible main structure of the human body, it holds the center of gravity, a key element in mobile entities on ground and in air.

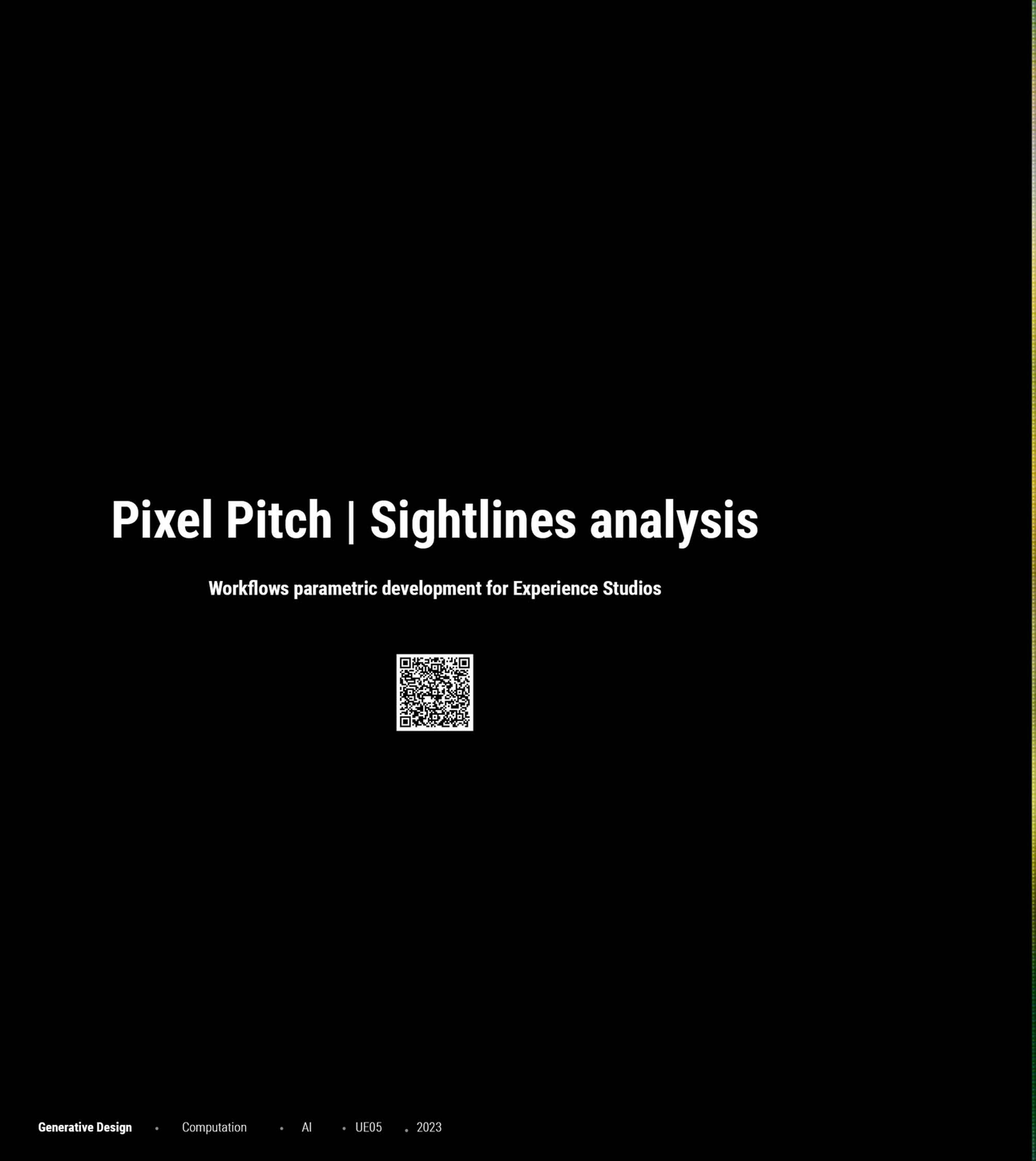
Mobile Entities- #25B

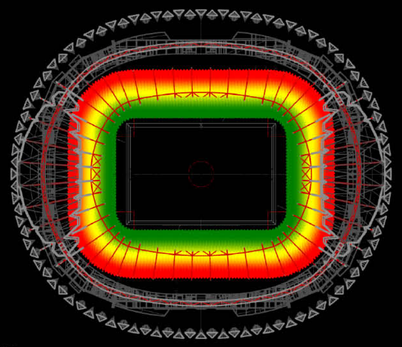
Generative Design • Computation • AI • UE05 • 2023

Mobile Entities- #15D

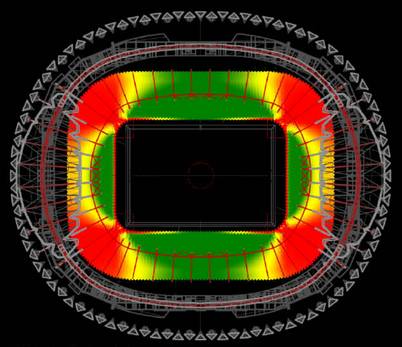
Pixel Pitch | Sightlines analysis

Workflows parametric development for Experience Studios

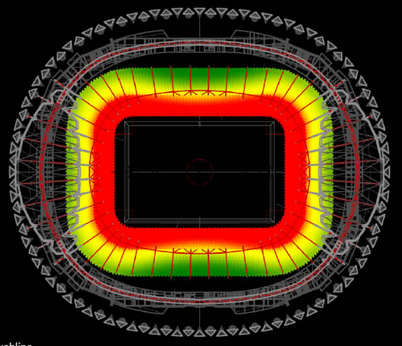




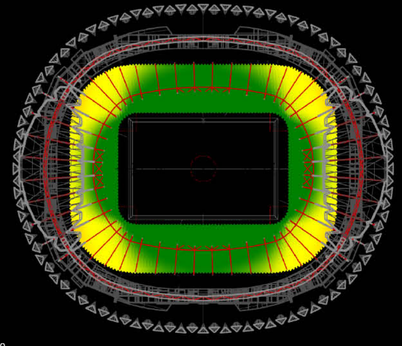
Vertical Angle 0-55



Optimization FOV and vertical angle view

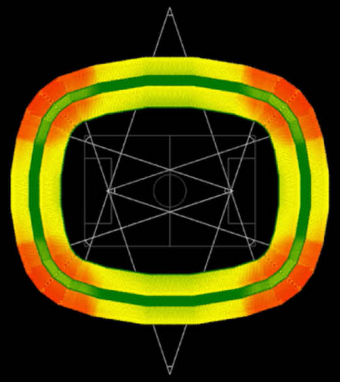


Proximity to touchline

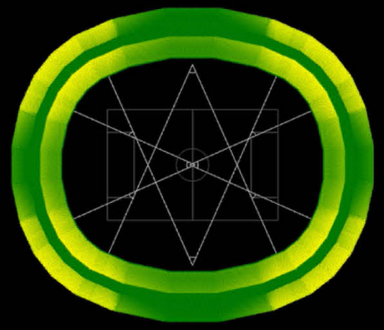


FOV- 30-120

Site Analysus Tests

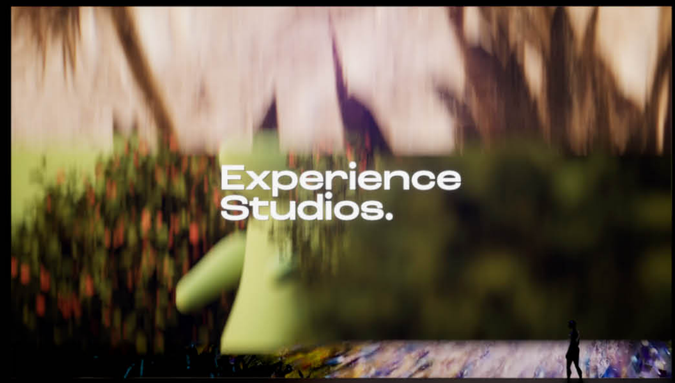


Touchline Angle



Touchline Distance

Analyzing sightlines and LED screens pixel pitchfor performance. sports and visuals



15m Viewing Distance

Led Panel Specifications

Panel W	600
Panel H	1,200
Panel D	79
Max Viewing Angle	140
Calculated Pixel Pitch	8.33

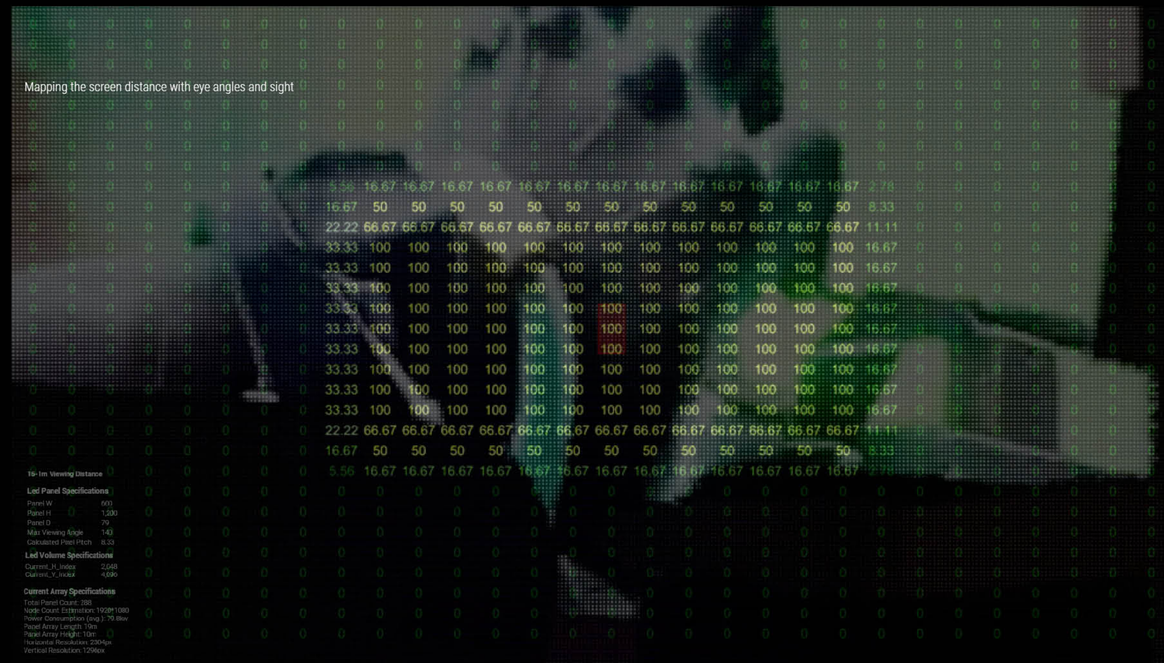
Led Volume Specifications

Current_H_Index	2,048
Current_V_Index	4,096

Current Array Specifications

Total Panel Count: 288
Node Count Estimation: 1920*1080
Power Consumption (avg.): 79.8kw
Panel Array Length: 19m

Mapping the screen distance with eye angles and sight



15- 1m Viewing Distance

Led Panel Specifications

Panel W	600
Panel H	1,200
Panel D	79
Max Viewing Angle	140
Calculated Pixel Pitch	8.33

Led Volume Specifications

Current_H_Index	2,048
Current_V_Index	4,096

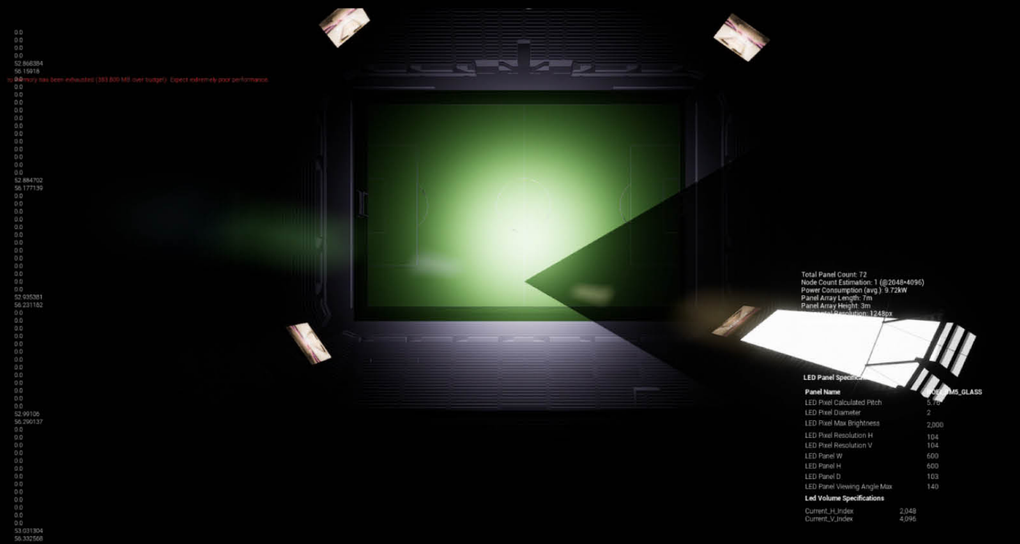
Current Array Specifications

Total Panel Count: 288
Node Count Estimation: 1920*1080
Power Consumption (avg.): 79.8kw
Panel Array Length: 19m
Panel Array Height: 10m
Horizontal Resolution: 2304px
Vertical Resolution: 1296px

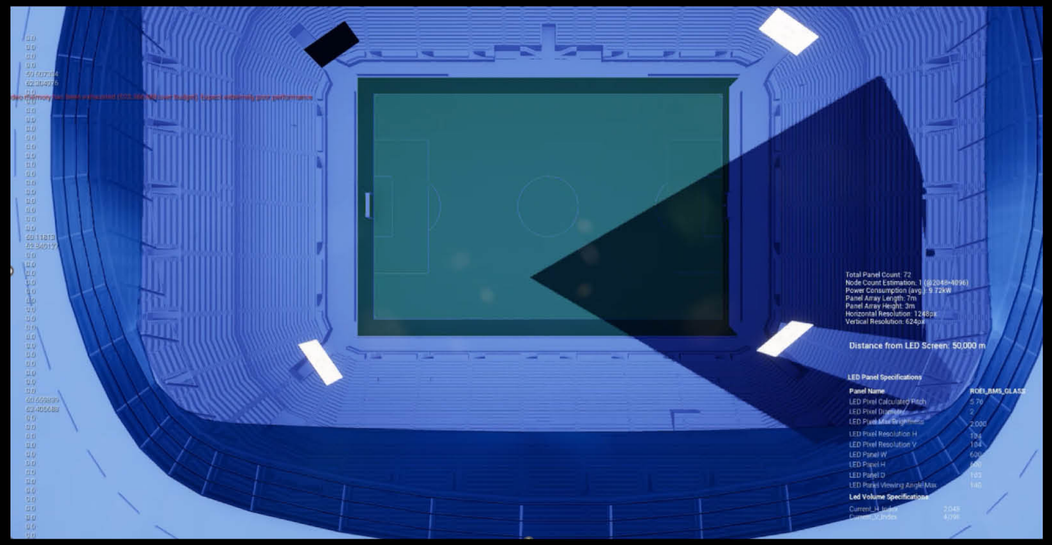
Generative Design • Computation • AI • UE05 • 2023

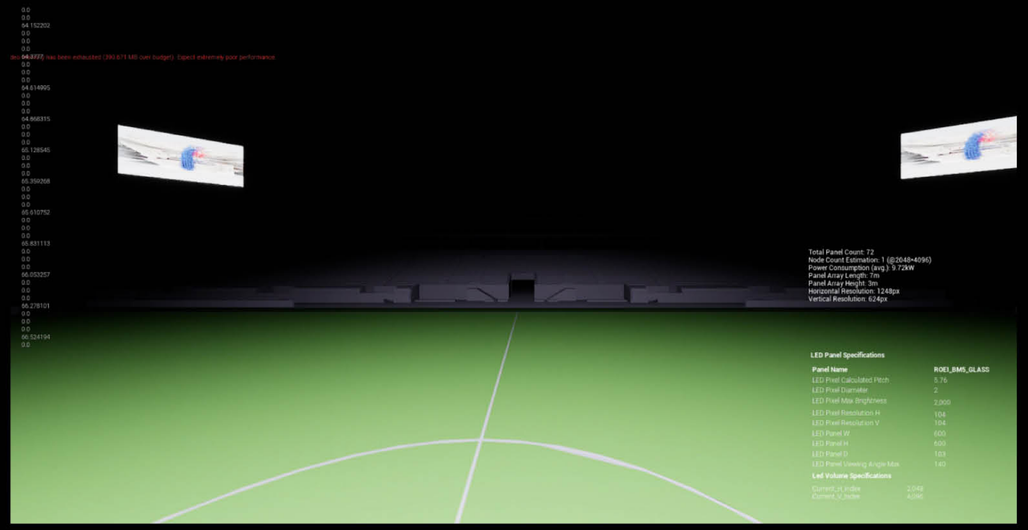
Parametrize dynamic FOV tool

Importing Stadium and creating a "Hit" algorithm adaptive to eyesight
measure viewing distance in order to dictate resolution and text size.

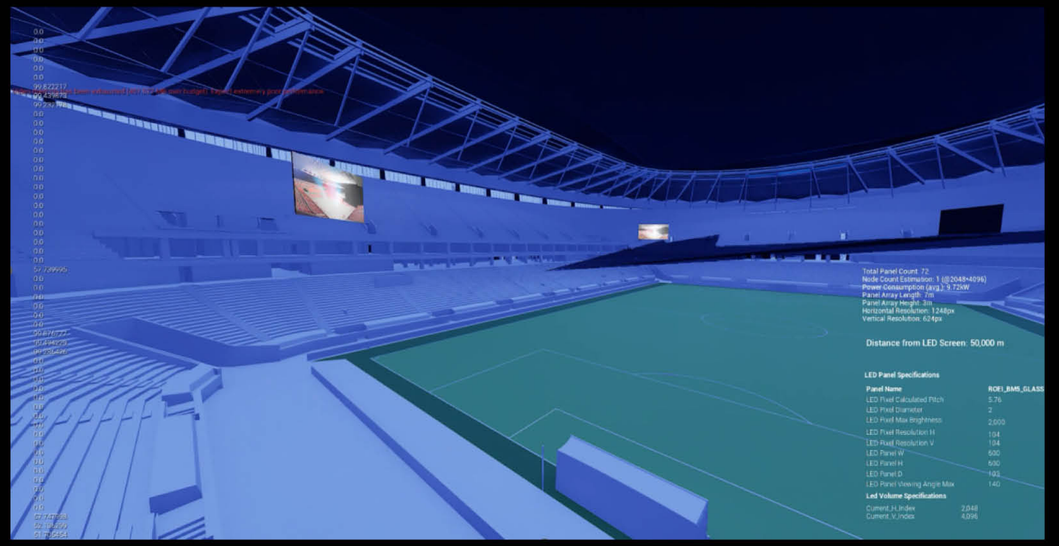


LED Specifications and view cone dynamic tool- Top view





LED Specifications and view cone dynamic tool- First Person



House of the future

International Competition

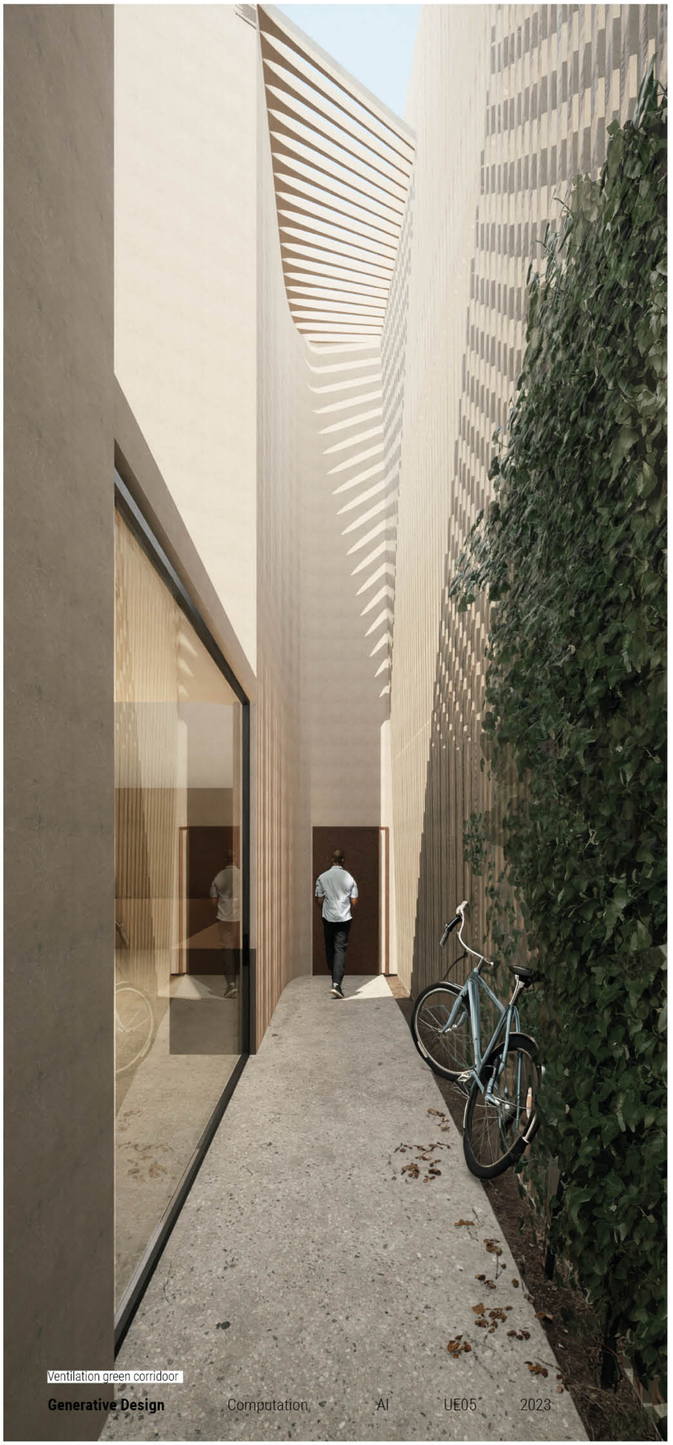
The house of the future is rooted in the past. It is a reinterpretation of the traditional courtyard house, combining low-tech traditional techniques with advanced computational and construction technologies to create a flexible and sustainable house. Looking back at historic Islamic cities around the Persian Gulf and North Africa, we learned that Islamic values of community humility were expressed by placing courtyard houses with immediate adjacency to each other, creating a sense of closeness and community, while greatly reducing the solar exposure of each house. We propose to bring back this spirit, and to develop new communities in Dubai in which each house is protecting its neighbor from the sun, and neighbors come together to create a community.

The central courtyard brings air and light to all the spaces of the house, while creating a microclimate that helps manage the climate of the interior spaces. On the perimeter of the house, a narrow exterior corridor creates another climatic buffer, which works in conjunction with the central courtyard to facilitate natural ventilation in the house, significantly reducing the need for active air conditioning. Around the exterior climactic buffer space, a parti wall is shared with the neighboring houses, drastically reducing solar exposure and heat gain.
The inner façade of the house, facing the courtyard, is a self-supporting structure, optimized using computational technologies to maximize structural efficiency while minimizing solar exposure. It is constructed using load bearing bricks, placed in a complex pattern using a robotic construction method. The façade densifies where privacy is needed and dematerializes where more light and connection to the courtyard are required.

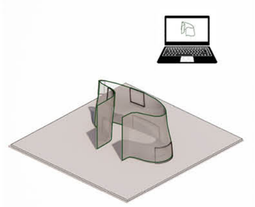
The initial construction of the house functions as a framework, in which different functions and expansions can take place. As the needs of the family grow and evolve, the house can grow and evolve, using a modular system of construction to allow for change over time. This modular approach to the construction also means that this house can serve as a benchmark for future houses, each expressing its own individual needs within the flexible framework that this concept proposes.

The traditional courtyard house is re-envisioned as an advanced bioclimatic system, with a parametric courtyard design and a low-tech external climate buffer. The design combines ideas from the past with the technologies of the future to create not only the house of the future, but the society of the future.

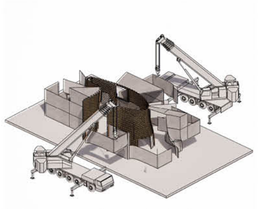
House of the future competiotion- Majelis View
Visuals created from Unreal Engine 05



Ventilation green corridoor

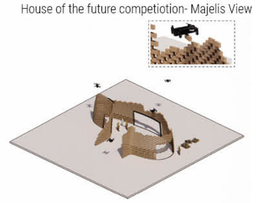


1. Formulating the desired and most efficient courtyard space.

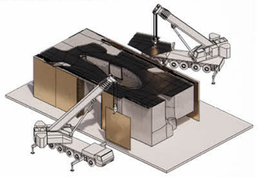


3. A crane elevates pre-fabricated, custom-made UHPC elements that interlock and shape the interior of the house.

House of the future competiotion- Majelis View

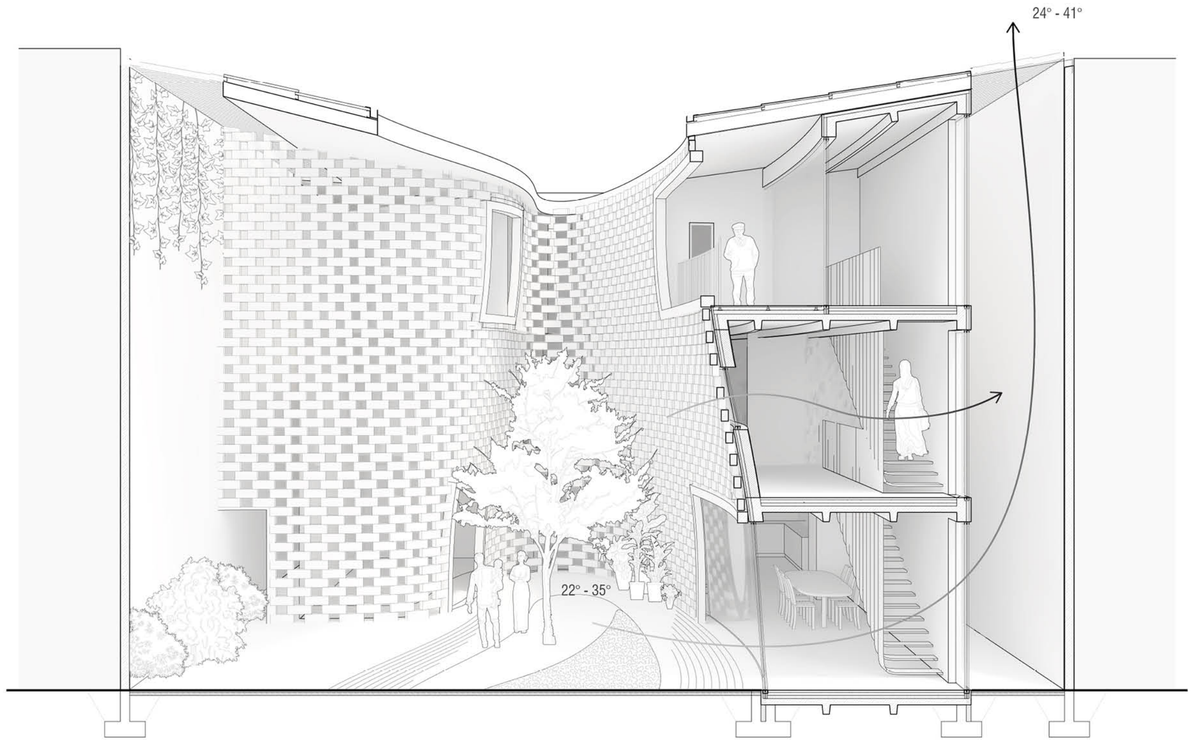


2. A swarm of drones rapidly completes the courtyard envelop utmost precision in a matter of hours.

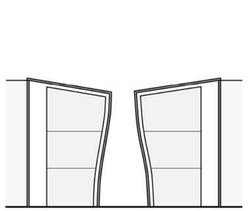


4. Photovoltaic solar panels are being fitted on the roof, partition walls are being installed between neighbouring properties, and the climatic corridors are being established.

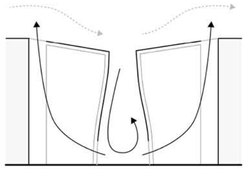
House main facade
Visuals created from Unreal Engine 05



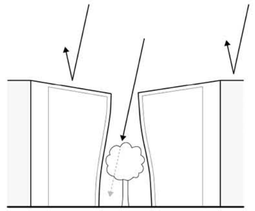
Section 1:50



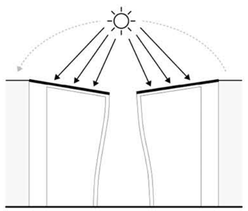
Inner / Outer structures



Natural Ventilation



Minimal Solar Gain



Photovoltaic Panels

The central courtyard brings air and light to all areas of the house while creating a microclimate that helps regulate the interior climate. Along the perimeter of the house, a narrow exterior corridor serves as an additional climatic buffer, working in tandem with the central courtyard to facilitate natural ventilation within the house. This significantly reduces the need for active air conditioning. The exterior climatic buffer space, shared by neighboring houses, effectively minimizes solar exposure and heat gain. Both climatic spaces—the courtyard and the perimeter corridor—also serve as circulation areas. The main circulation of the house follows the perimeter of the courtyard, while access to the service spaces is through the external corridor.

Brickwall courtyatd
Visuals created from Unreal Engine 05

PROJECTS

In construction 2023 - SD,DD,CD

Xian CCBD | Heatherwick Studio

YGAA • DD,CD Mixed use • Revit, BIM 360 • 2019-2022

YGAA- Gutman Assif Architects

YGAA is an architecture practice based in Tel Aviv, Israel. An energetic architecture and urban design firm, practicing a wide range of domains and scales. Combining creative impulse, with public sensibility, we think of space and urban solutions, by collection and processing environmental, economic and social data. In each project we challenge and redefine building typologies, urban infrastructure and programs to suit the client, user and city needs. By constant change and innovation we create living, working, learning and leisure environments – fresh and great to use.

Projects I lead in the practice-

Balady- Mixed Use Tower (42 stories) Plot 127 - Residential, Commercial & Offices Tower- Gutman Assif Architects
Location: Bat-Yam, 22,000 sqm
Under construstion
Residential, office, Hotel and commercial tower.

'Hareches Hotel', Jerusalem- Hotel & Residential Complex - Gutman Assif Architects
Location: Jerusalem, 12,000 sqm
Under construstion
Residential, Hotel and commercial Floor.

SISUAN | Industry Distribution and Functional Division,Guangdong - Gutman Assif Architects, 2017

Location: Guangdong, 90,000 sqm

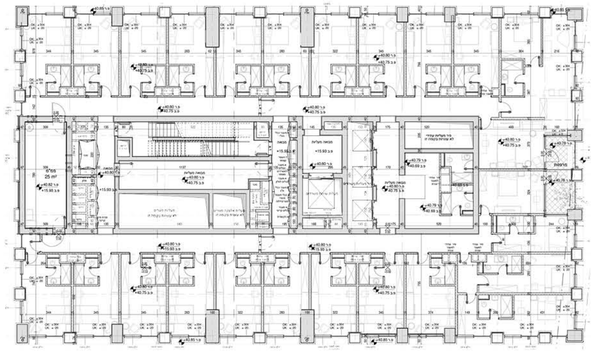
Research, Parametric design for industrial and laboratory compound.
The main idea is a "Sponge Town" that will provide a solution for flooding and rising Water levels in the area.

YGAA • DD,CD Mixed use • Revit, BIM 360 • 2019-2022

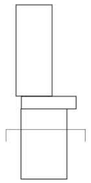
Balady 2019

Plot 127 - Residential, Commercial & Offices Tower- Gutman Assif Architects
Location: Bat-Yam
Under construstion
Residential, office, Hotel and commercial tower.

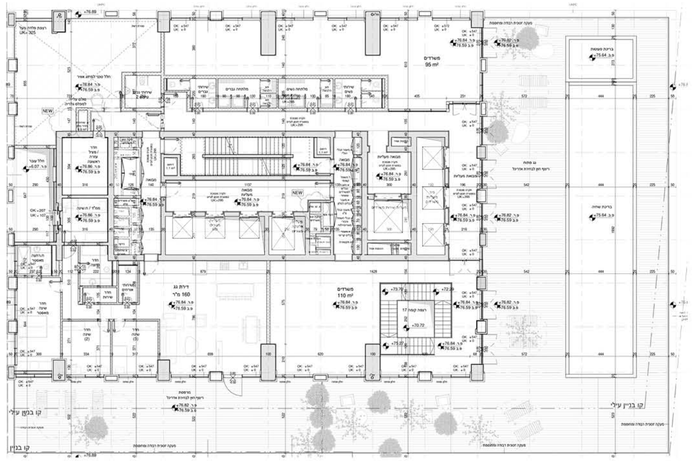
The design of the tower poses challenges of integrating a complex program designed for different uses using a continuous vertical scheme. For the past two years I have been leading a team of architects for detailed design.
The tower is now under construction and the works are expected to be completed in 2025



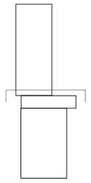
9th Floor- Hotel typical floor plan



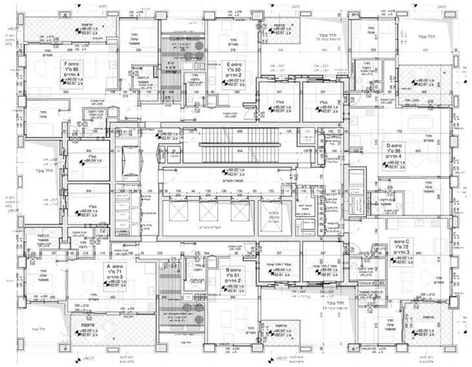
Hotel Typical Floor



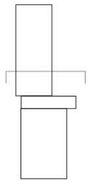
18th Floor- Hotel Outdoor pool and Lobby



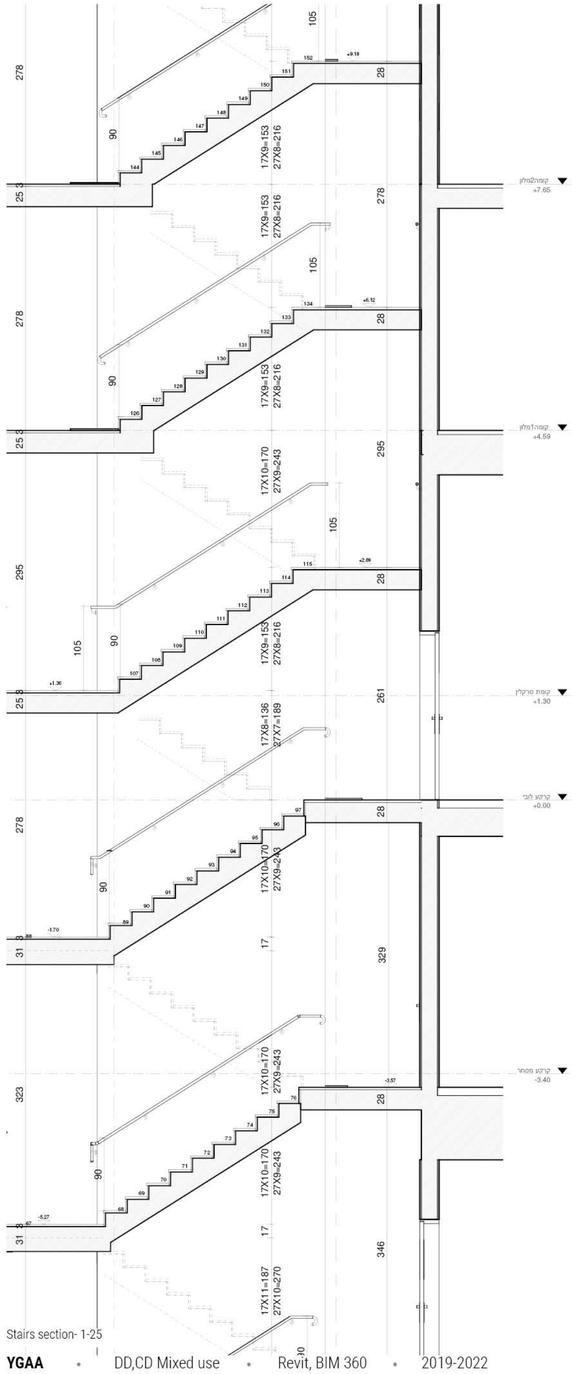
Pool Outdoor Floor



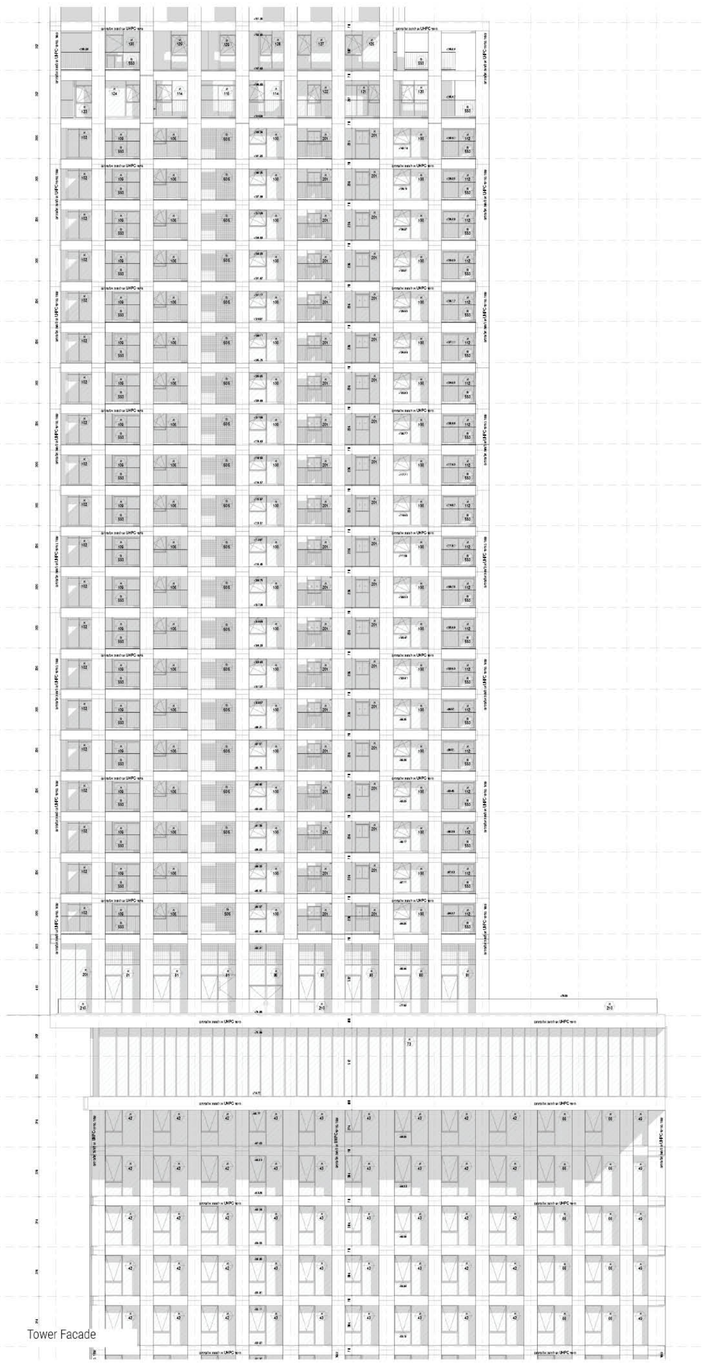
20th Floor- Residential typical floor plan



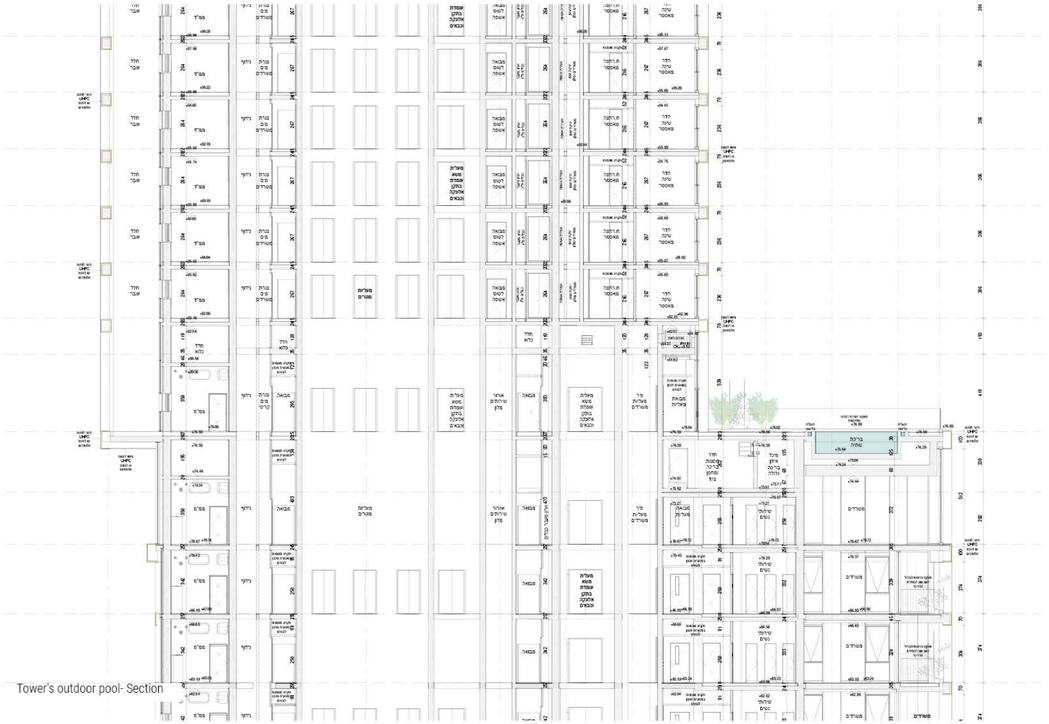
Residential Typical Floor



Stairs section- 1-25



Tower Facade



Tower's outdoor pool- Section

Tower's outdoor pool

Hareches Hotel 2021

'Hareches Hotel', Jerusalem- Hotel & Residential Complex - Gutman Assif Architects

The complex has two buildings - one is a Hotel contains 180 units and the other is a residential building contains 20 housing units, both share a commercial ground floor.

Hotel's outdoor pool- 3d

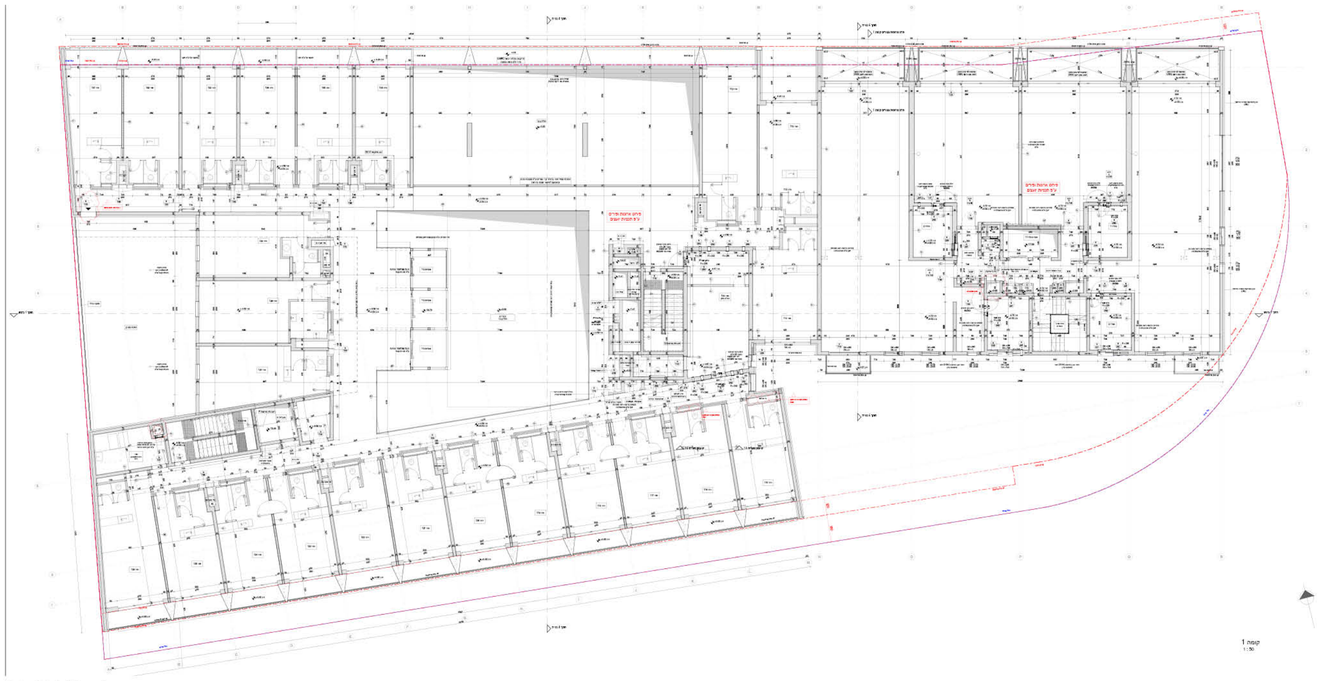
YGAA DD,CD Mixed use Revit, BIM 360 2019-2022

Northern Elevation- Commercial colonade

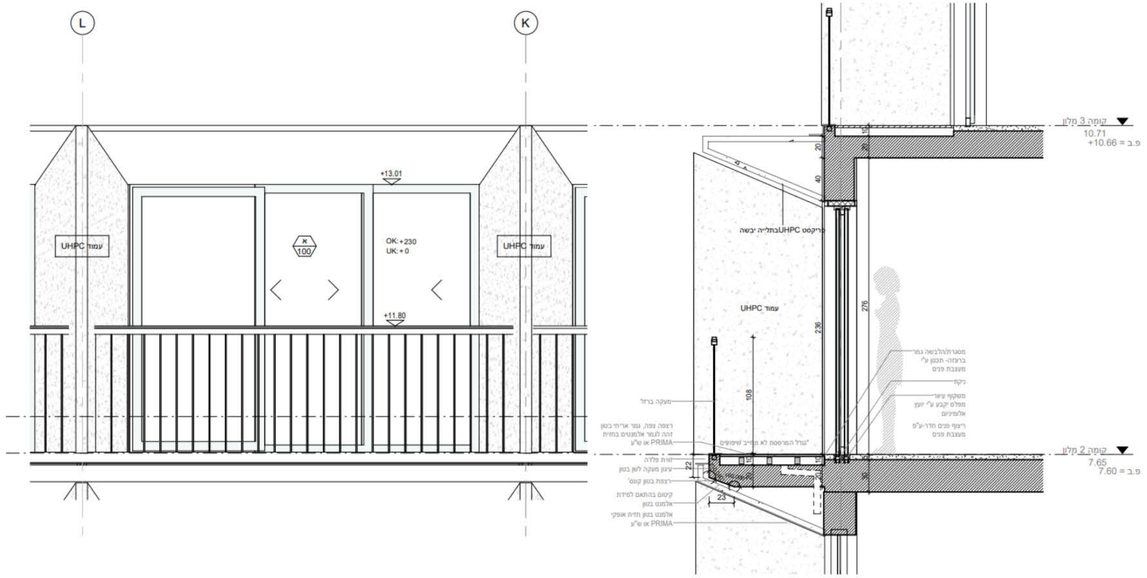
Main Dining Room view- Ruth Arad interior design

Typical hotel room- Ruth Arad interior design

YGAA • DD,CD Mixed use • Revit, BIM 360 • 2019-2022

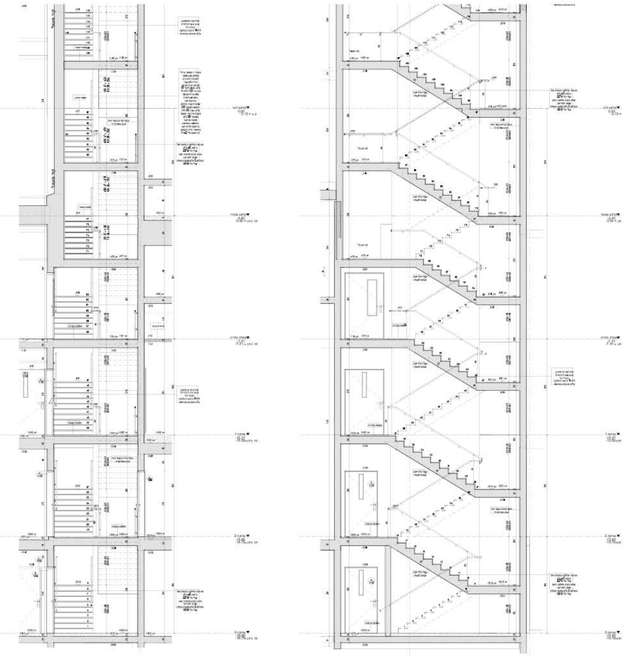


Typical Hotel floor plan



Facade Details- UHPC

Northern Facade



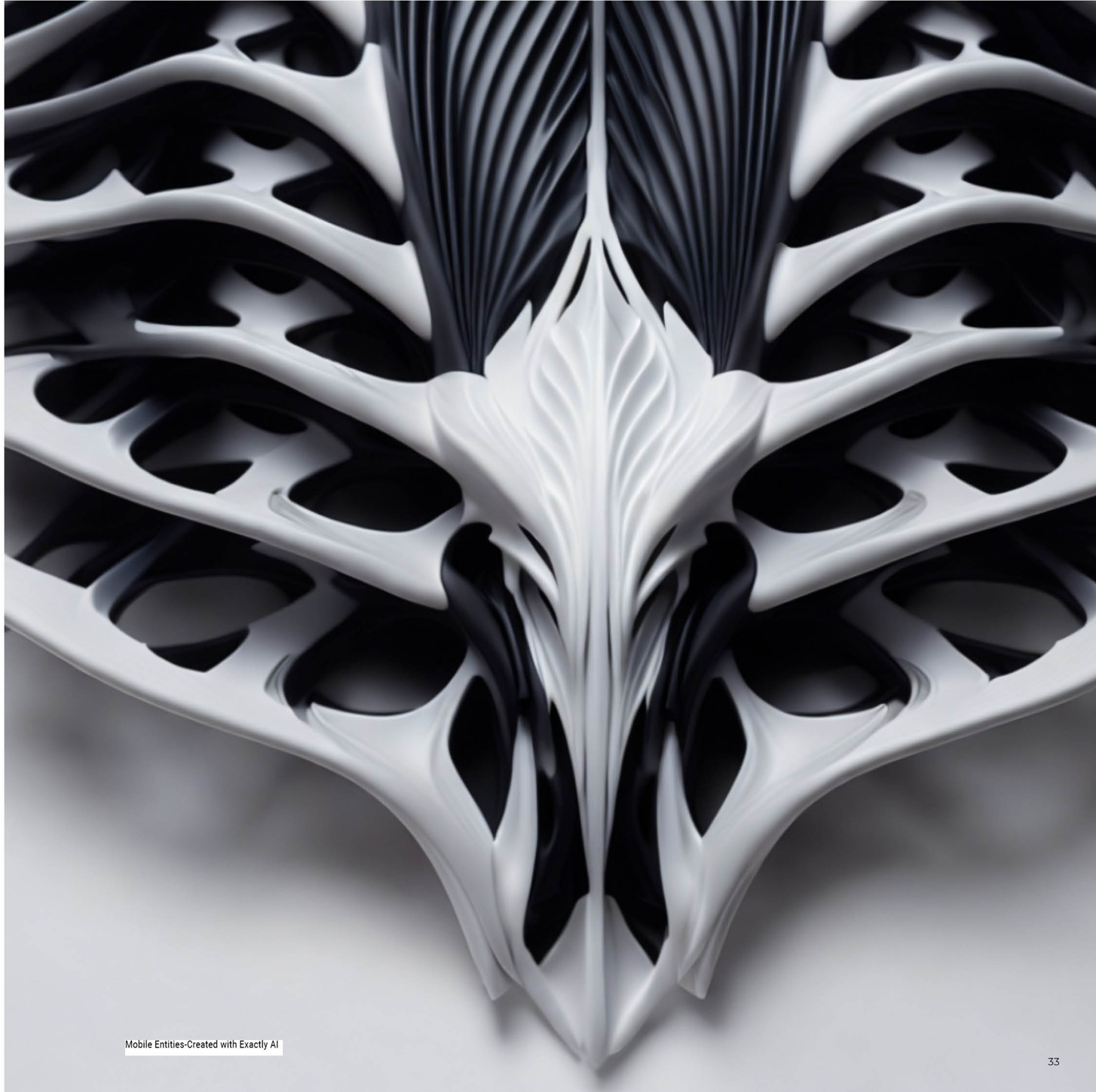
Stairs Section 1-25

Northern Facade-3d

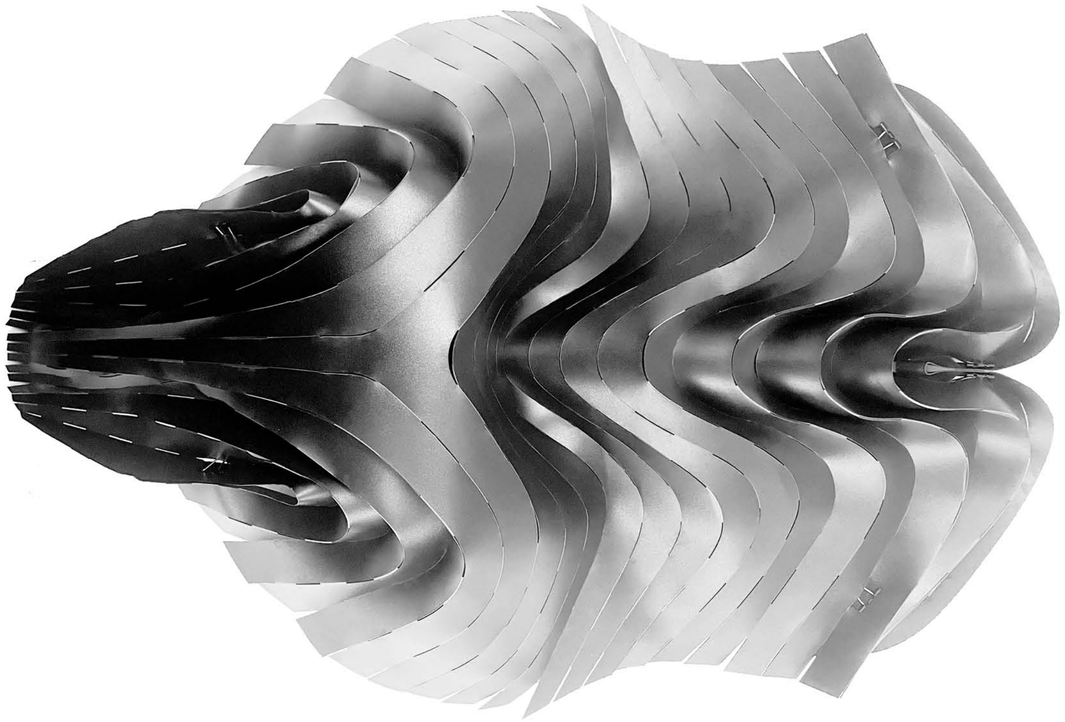
YGAA DD,CD-Mixed use © Revit, BIM 360 2019-2022

DIGITAL FABRICATION

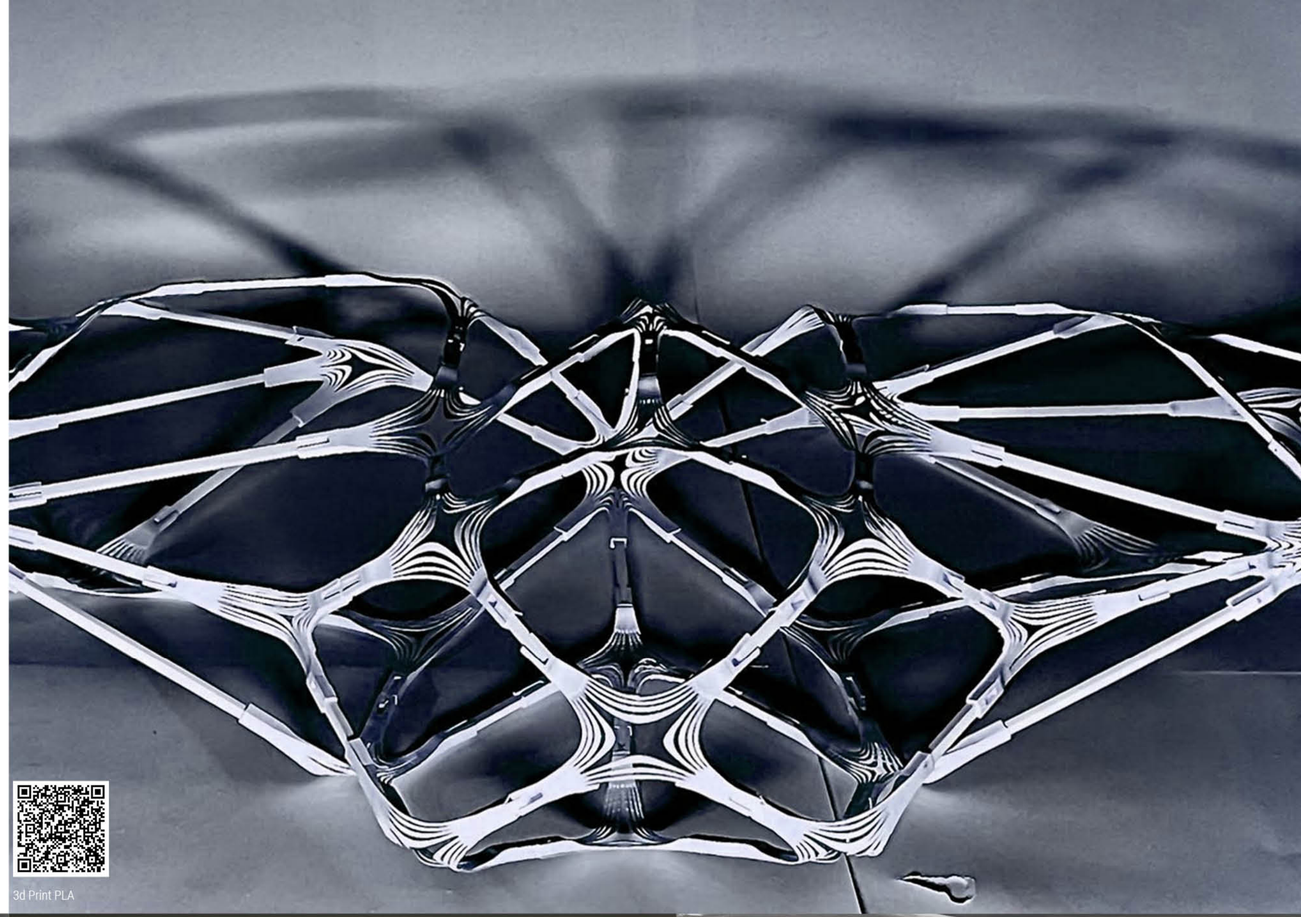
Various 3D modeling techniques are presented in this chapter. Most of them are 3D printing using different materials, PLA, PVA, TPU. Another method is using laser machines to produce cuts in two-dimensional surfaces and create three-dimensional shapes using parametric tools. Casting techniques are also presented in the shape of mold work and castings in various materials such as silicone, epoxy, plaster, and glass.



Mobile Entities-Created with Exactly AI

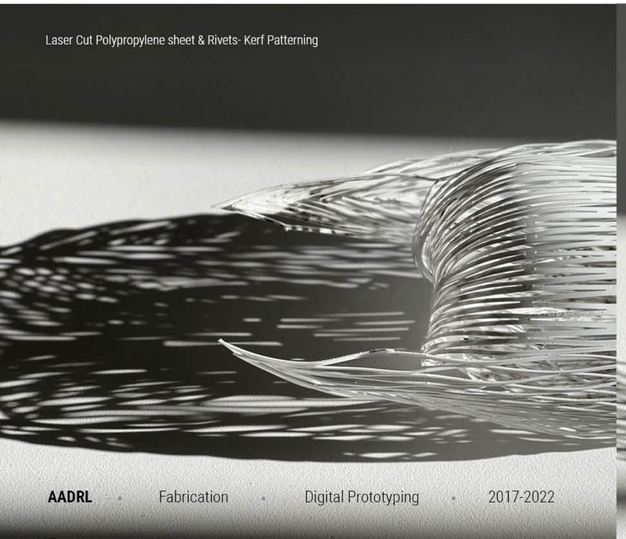


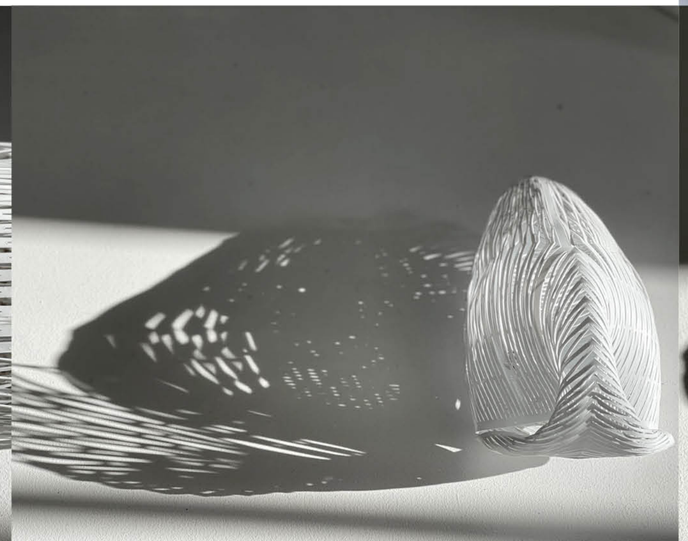
Curve Creased Pleating, Laser Cut Polypropylene sheet

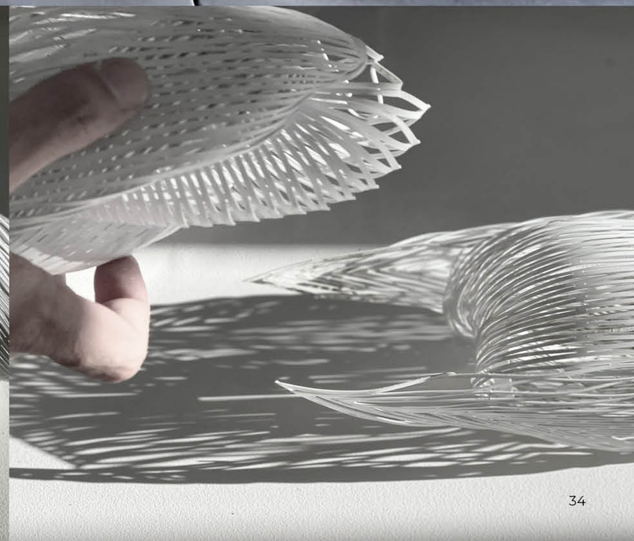


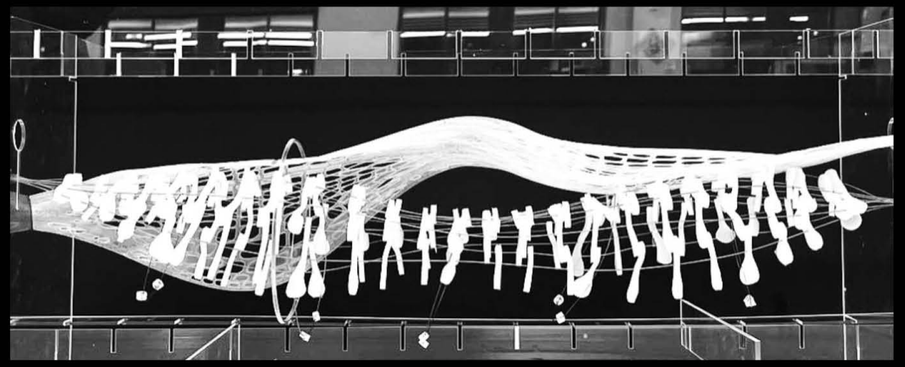
3d Print PLA

Laser Cut Polypropylene sheet & Rivets- Kerf Patterning

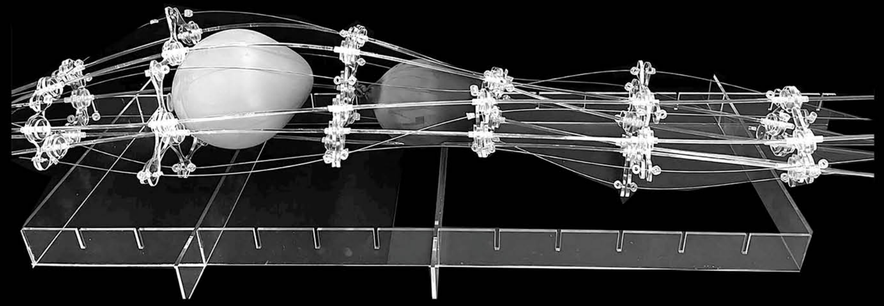






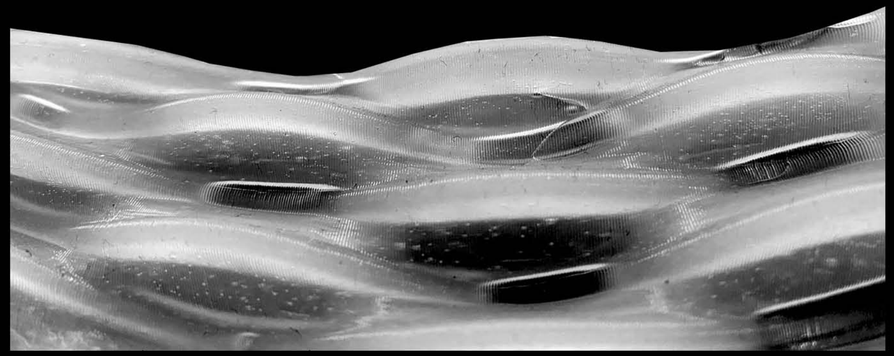


Acrylic cage, piano wires, silicon joints and laser cuted skin

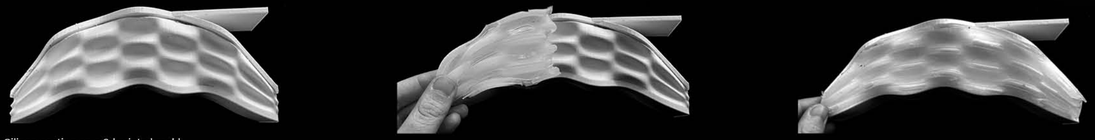


Acrylic cage, Piano wires, laser cuted acrilyc joints

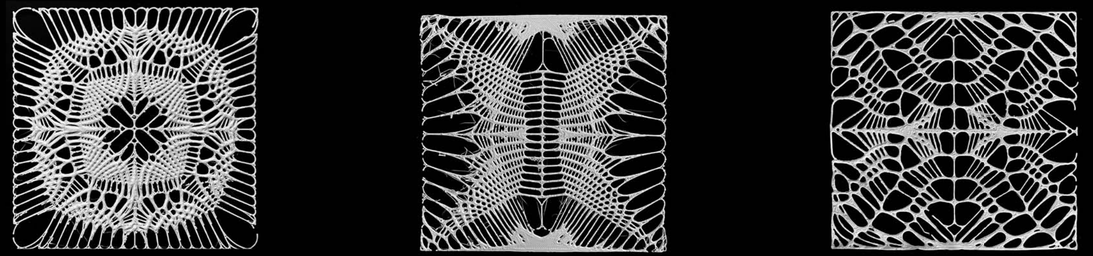
Silicon casting on a 3d printed mold



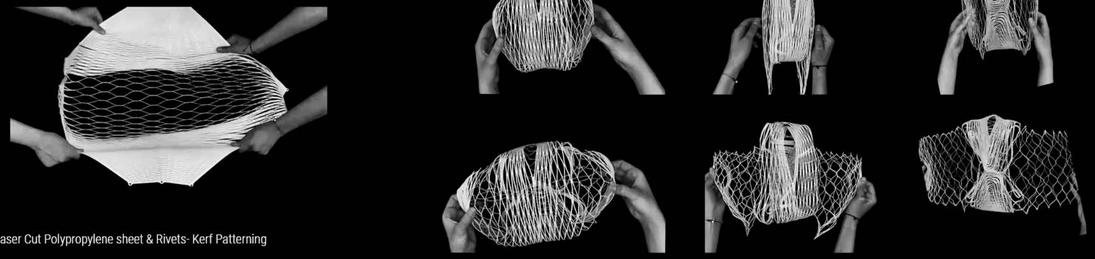
3d Print PVA+PLA



Silicon casting on a 3d printed mold

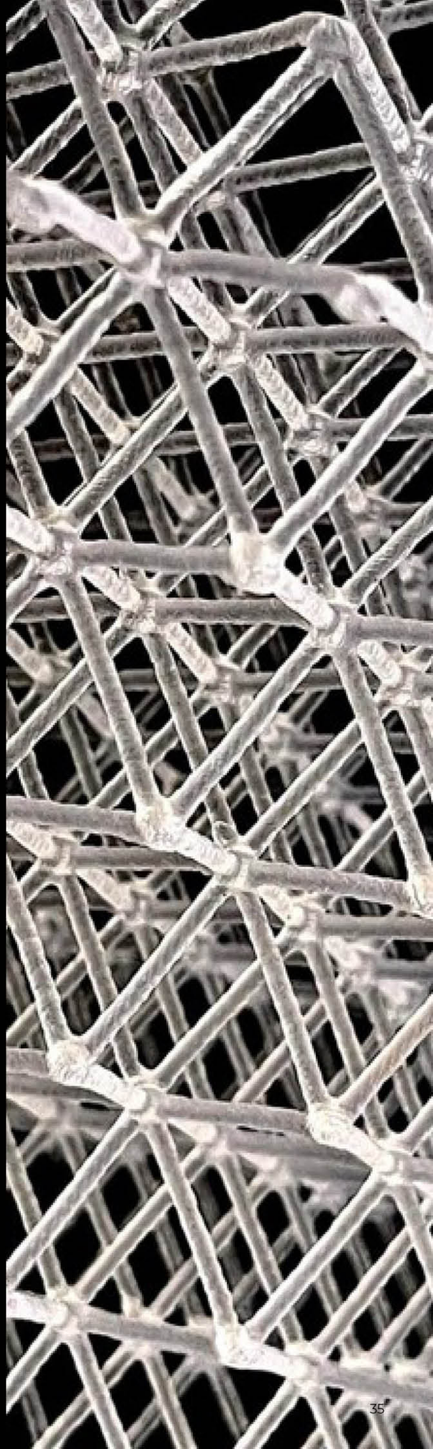


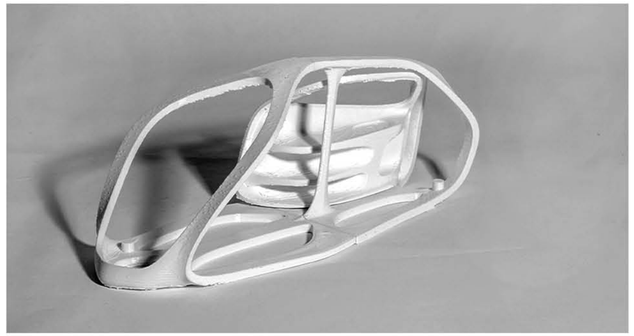
3d Print PLA

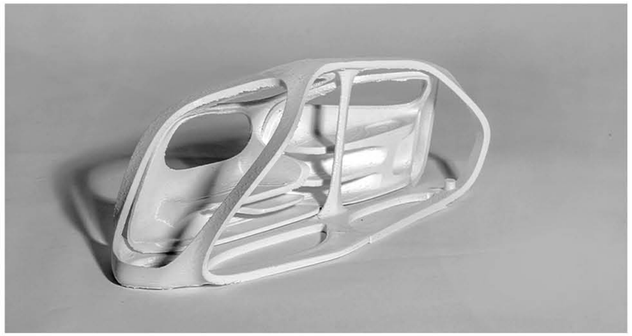


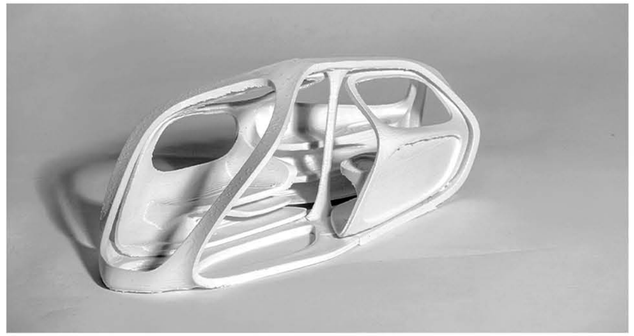
Laser Cut Polypropylene sheet & Rivets- Kerf Patterning

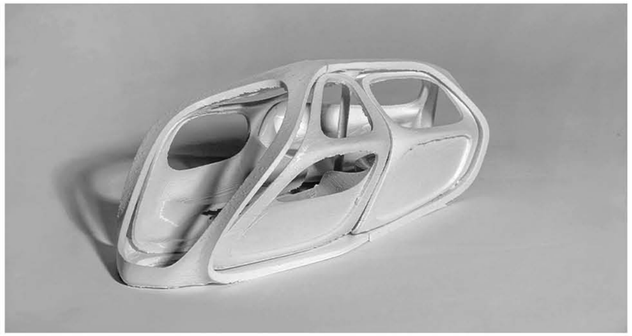
Micro-Lattice - 3D Printed Elastic Resin

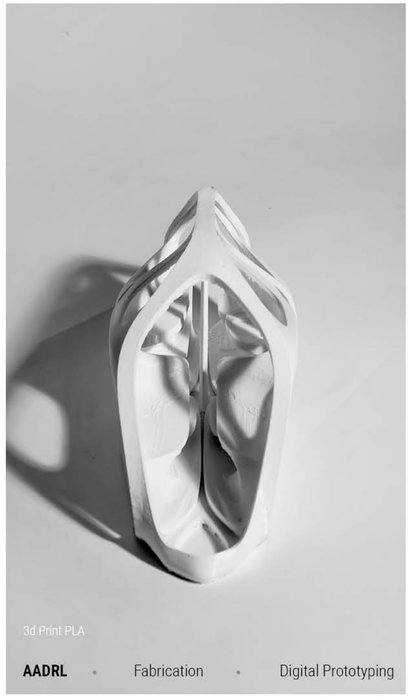




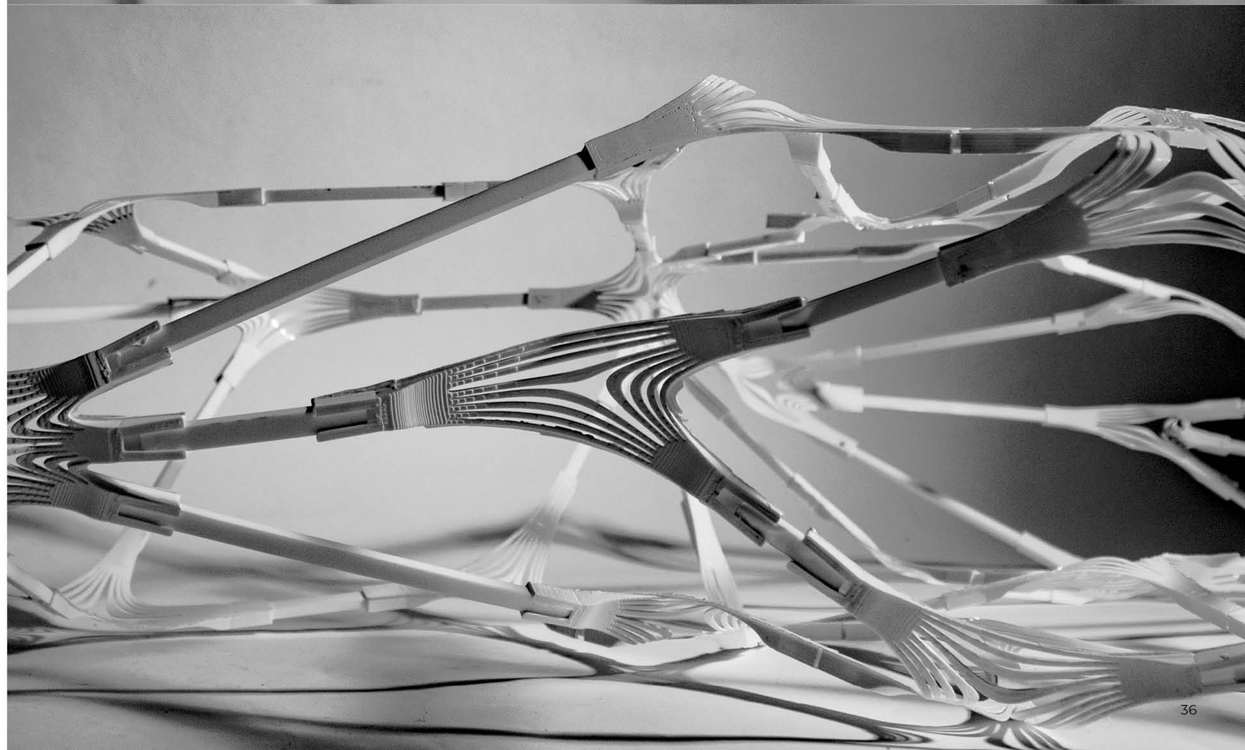


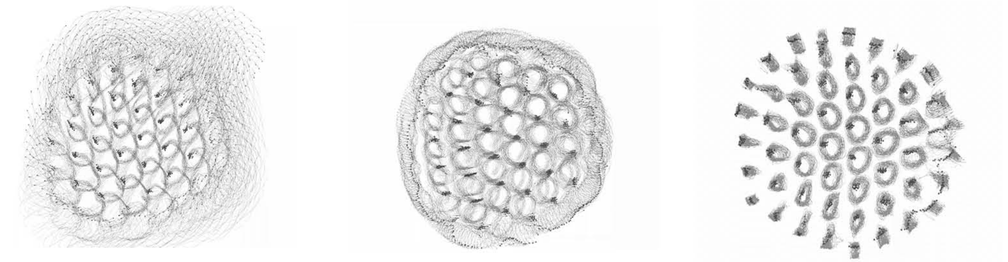


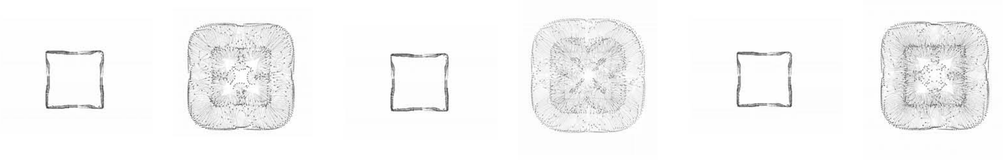




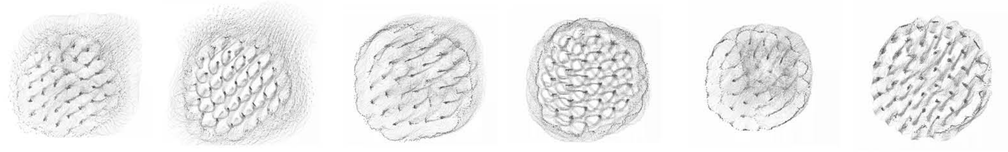
3d Print PLA





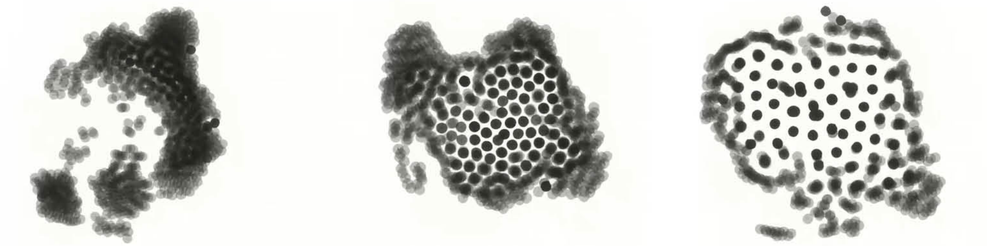


00:00:00 00:00:25 00:00:00 00:21:16 00:00:00 00:00:26

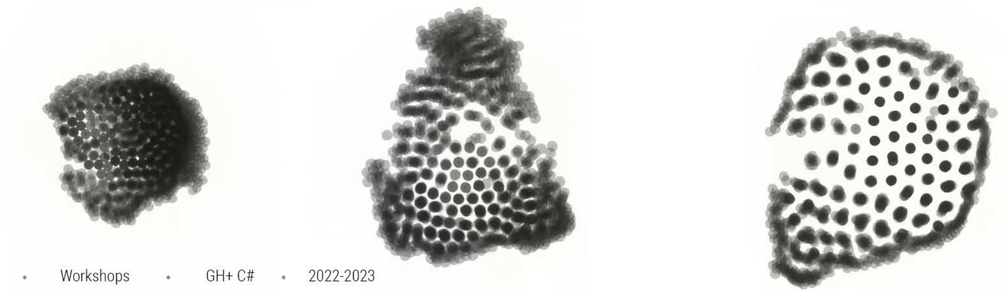
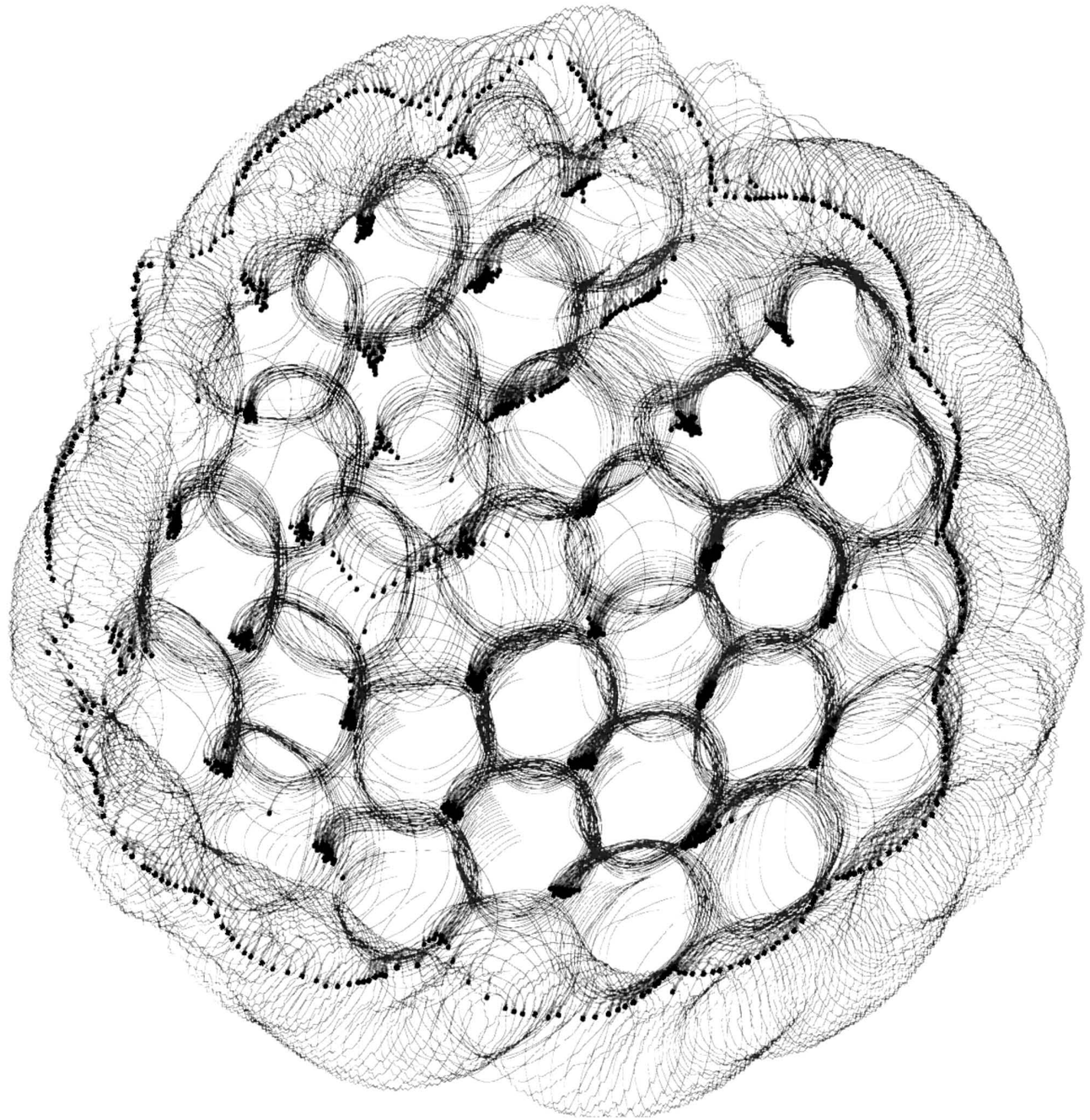
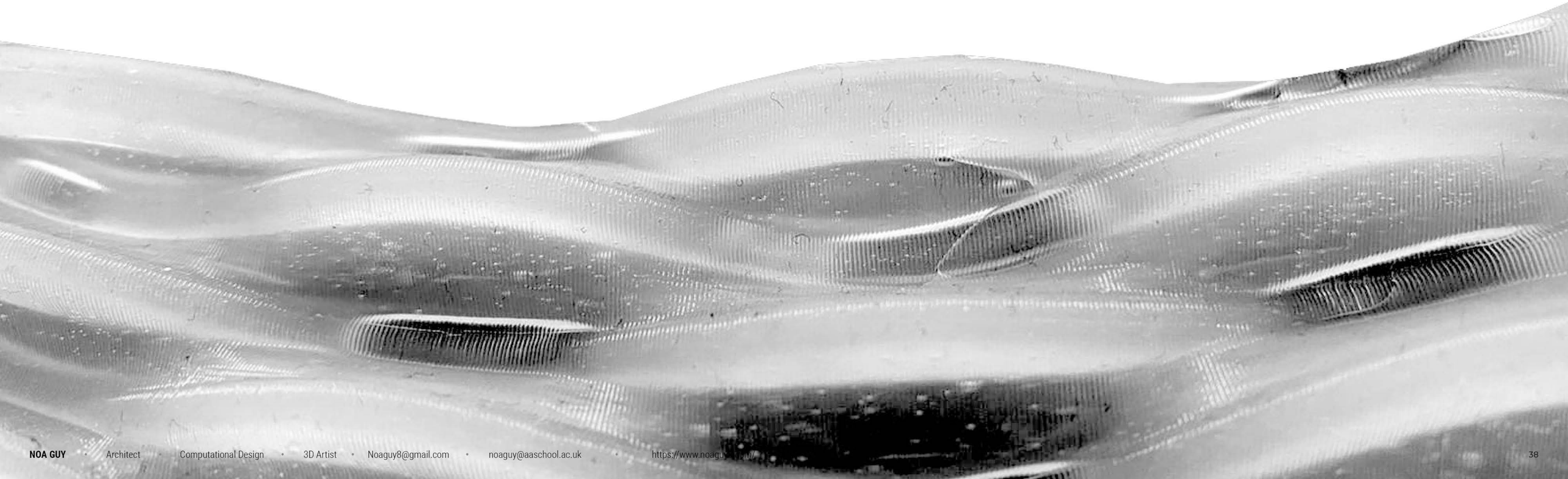


00:03:26 00:10:16 00:26:15 00:31:01 00:42:02 00:44:03

+ + Zoom out | Creating localized behaviors while changing the value of the distancing threshold (Neighbor Radius)



A
00:10:04
Neighbor Radius 5

B
00:10:04
Neighbor Radius 10

C
00:10:04
Neighbor Radius 15