URBAN FURNITURE_GROUP 3_ MIDTERM PRESENTATION

ADRIANNA KARNASZEWSKA
AGNIESZKA TRZCIŃSKA
KAROLINA KRZYŻANOWSKA
ZOFIA SOŚNIERZ

BIO-DUNE

RESEARCH

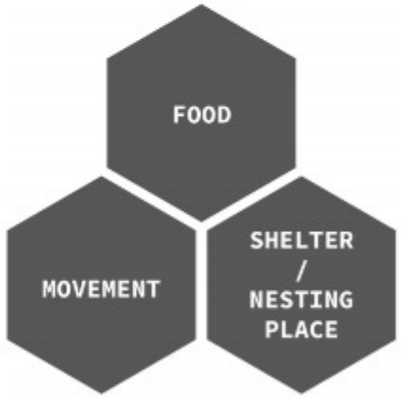
Urban biodiversity

• Urban animal need three conditions for survival:

- food
- shelter/nesting places
- movement

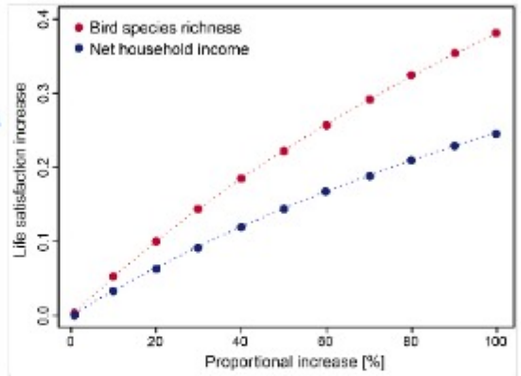
• Mostly provided in urban green spaces and partially in the urban built environment

• For some species conditions are:
- missing
- limited available
- too far apart



https://repository.tudelft.nl/islandora/object/uuid:64ec413a-aa5e-4833-af0e-bb7adabfaa8b

https://www.weforum.org/agenda/2020/12/study-birds-biodiversity-happiness-levels?fbclid=IwAR0LEWj6Z5A-2KaIPT3dIFqdsXqw8wvKBZgvCF4j2RC7T7YwO88IbSOLq-A



www.weforum.org

Being around birds linked to higher happiness levels

The study's authors calculated that being around 14 additional bird species provided as much satisfaction as earning an extra $150 a month.

Pressures on biodiversity in the cities

DENSIFICATION OF THE URBAN ECOSYSTEM

• Research has shown that densification:
- often leads to loss of existing urban green
- involves development of minimal amounts of green space that do not always contribute to biodiversity

• This will further increase pressure on biodiversity

• Increasing pressure on biodiversity can negatively affect quality of life for people in cities

• Ecosystem services: benefits experienced from nature

BIODIVERSITY DUNE_IDEA

BRINGING BACK THE NATURAL
INTO THE INDUSTRIAL

BIODIVERSITY DUNE_FUNCTIONS

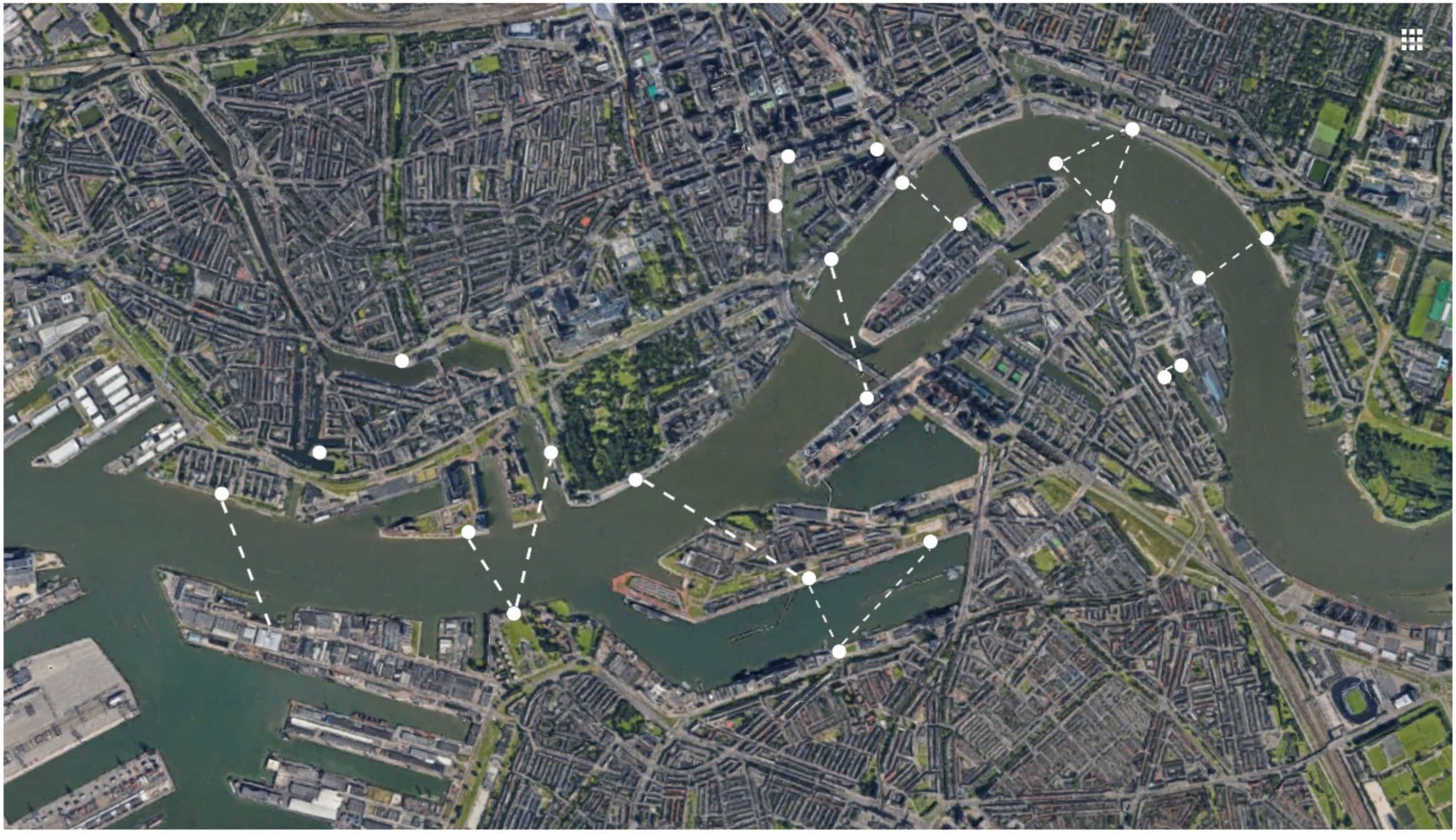
BENCH FOR PEOPLE

PLANTER

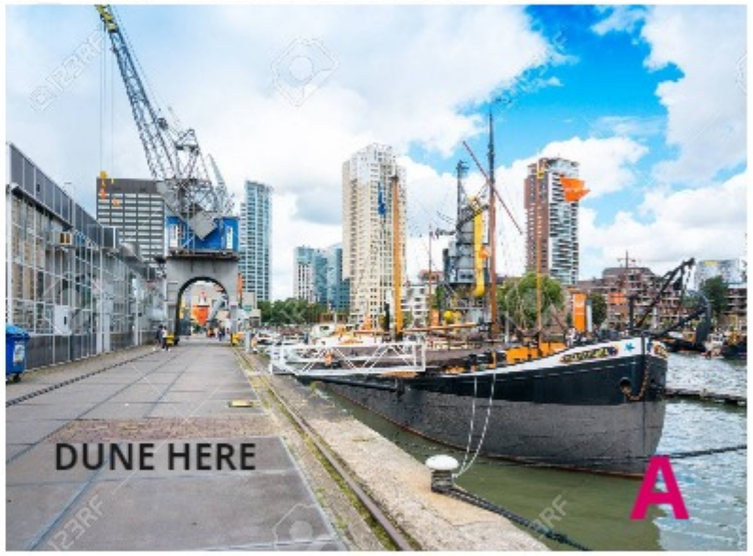
POROUS SHELTER FOR ANIMALS

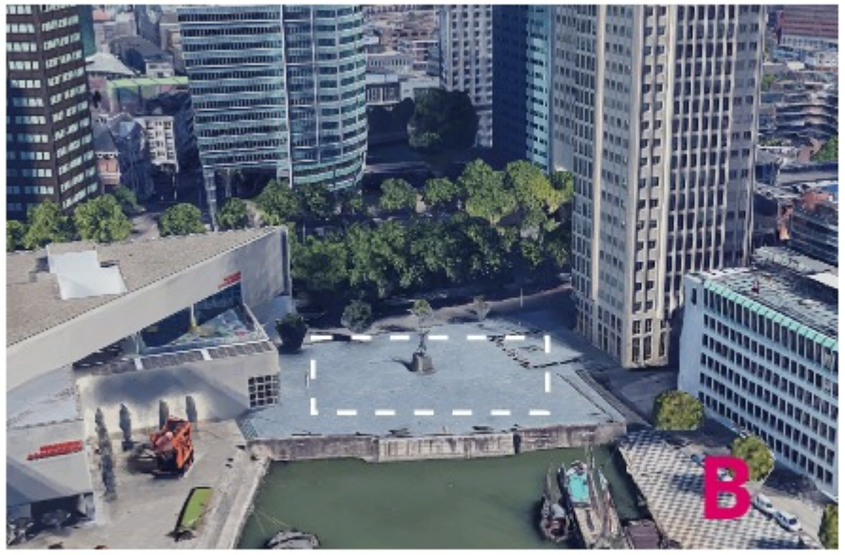
WATER RETENTION

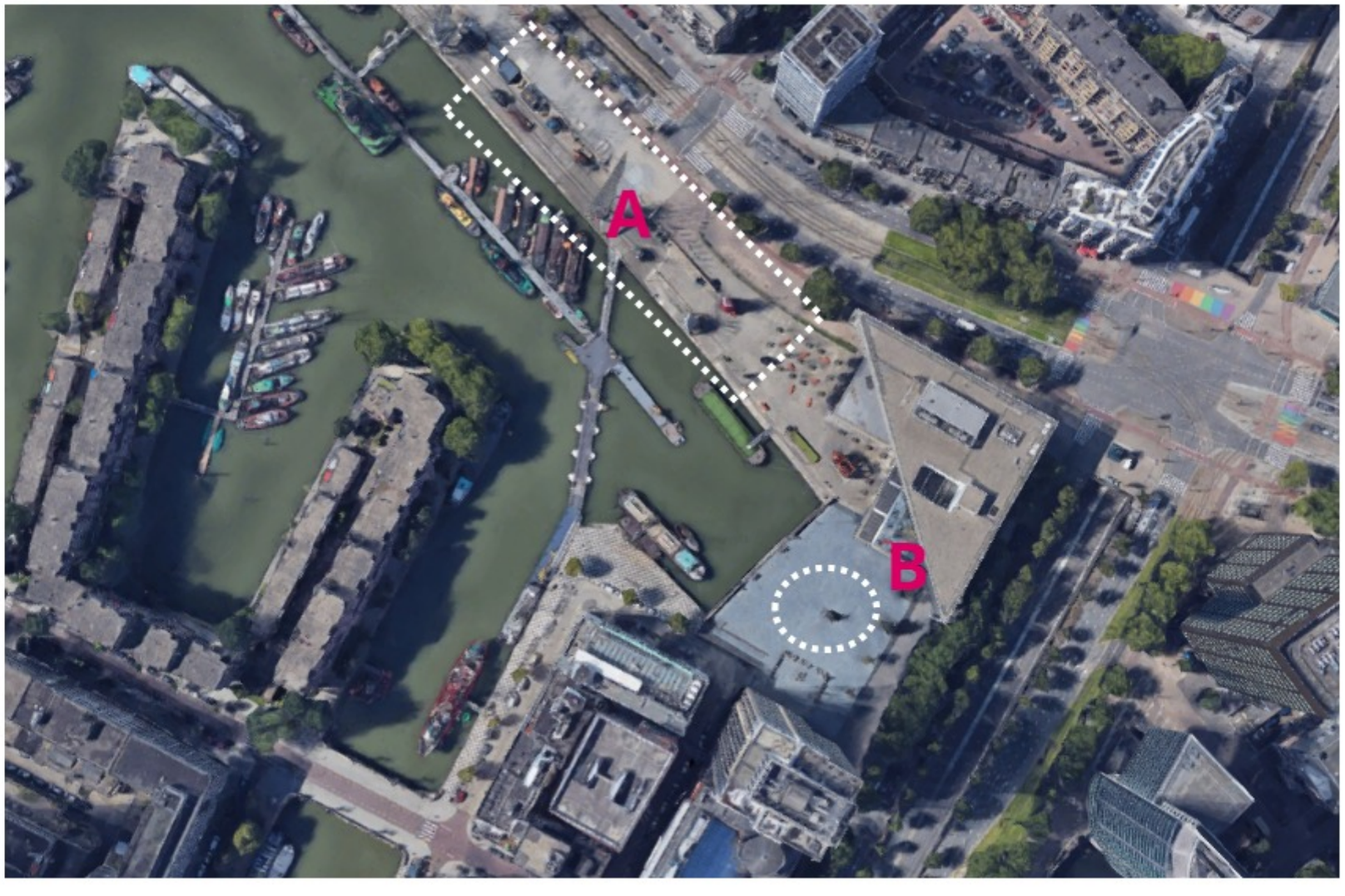
BIODIVERSITY DUNE_NETWORK OF LOCATIONS



BIODIVERSITY DUNE CHOSEN LOCATION

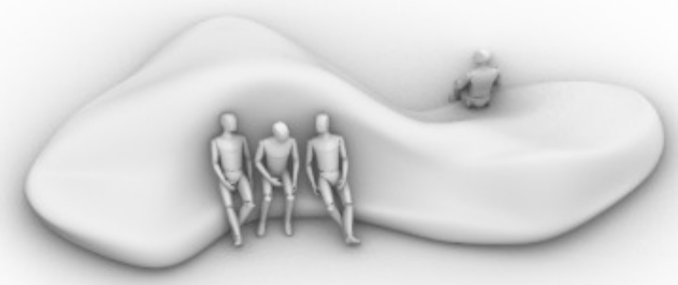






DUNE FORM DEPENDS ON THE SITE CONDITIONS AND NEEDS

PAVILION / BUS STOP

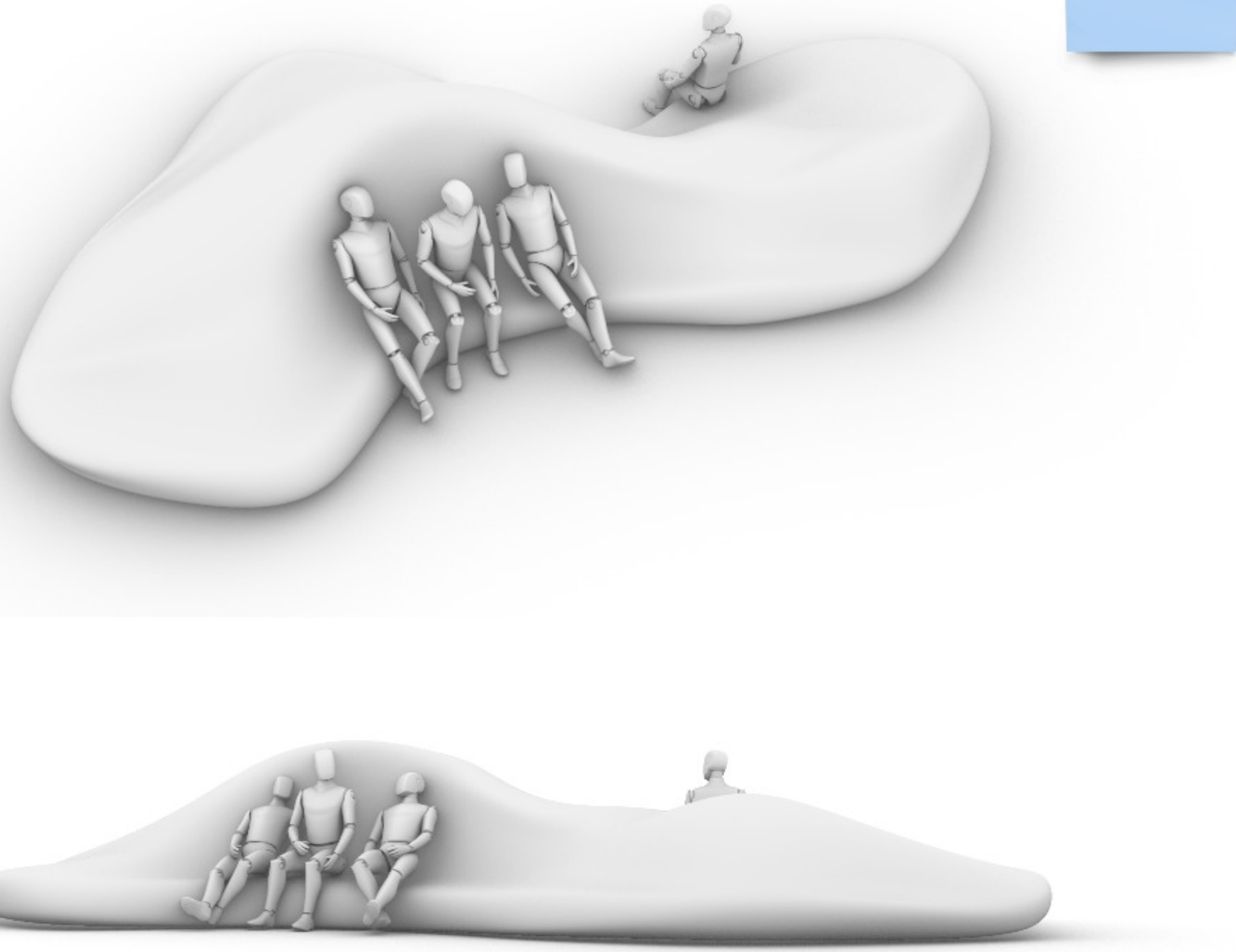


URBAN SEATING

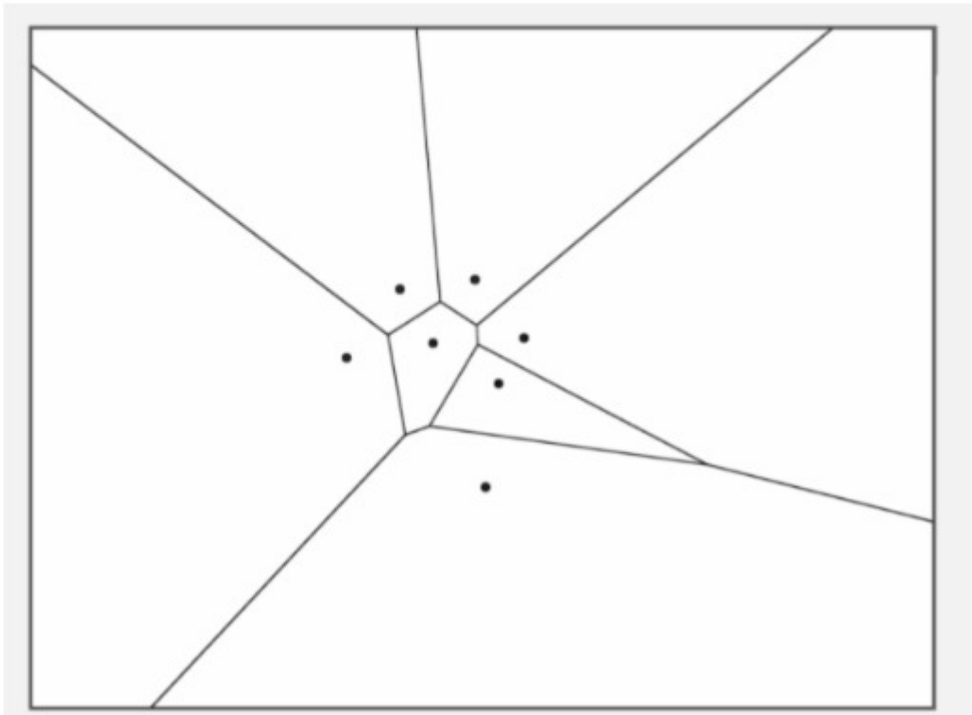
SINGLE BENCH

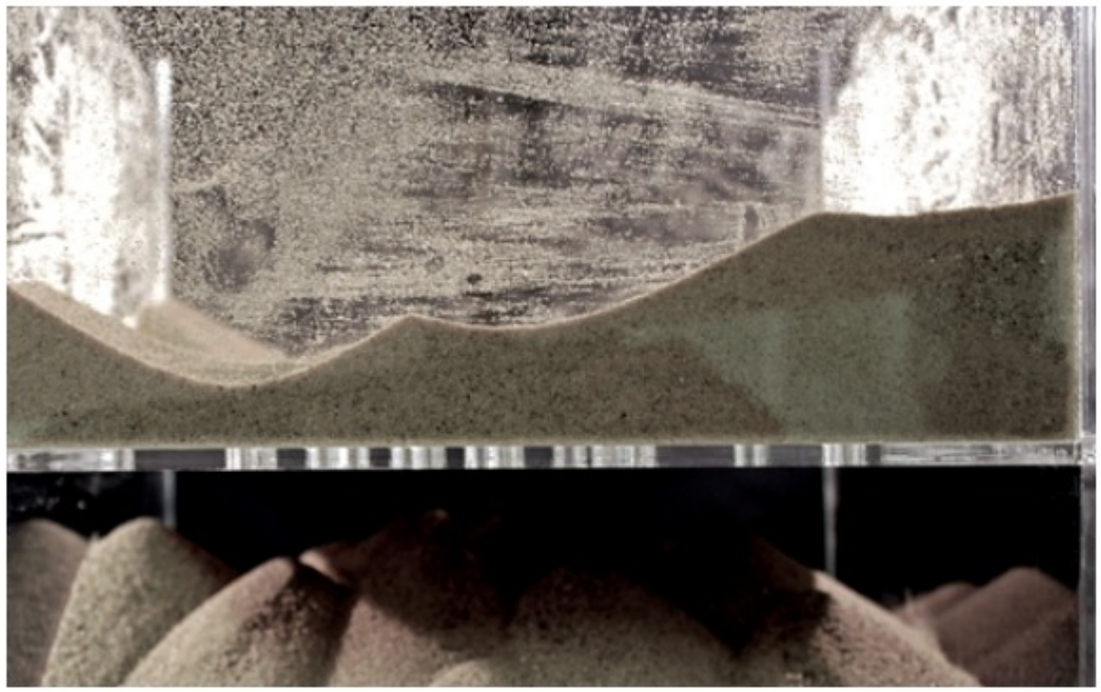
CONCEPT_MEDIUM SIZED DUNE

PIECE FOR PROTOTYPING



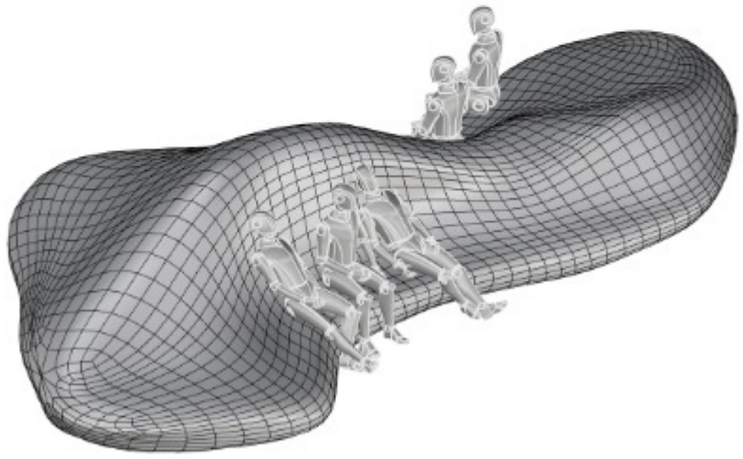
DUNE_VORONOI LOGIC



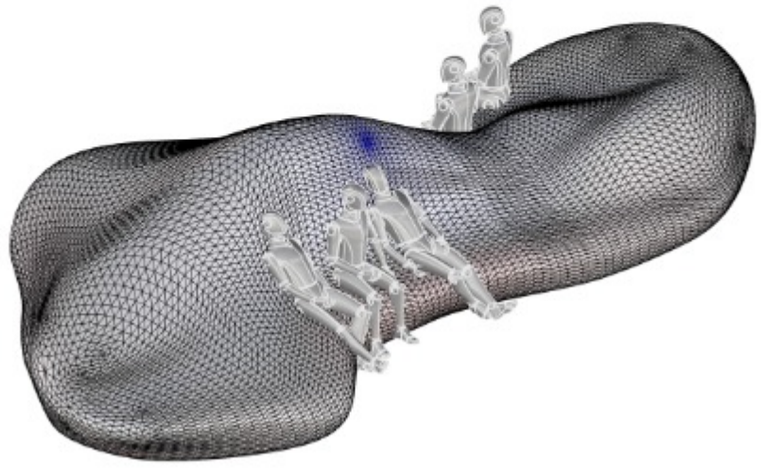


DUNE_MODELLING STEPS

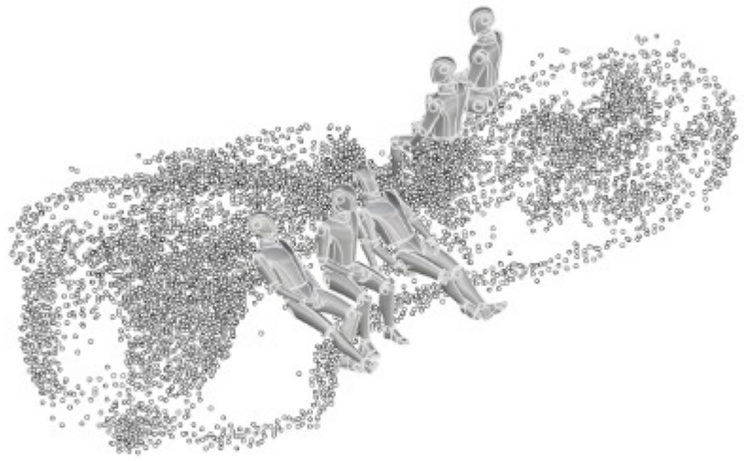
1.MAIN VOLUME



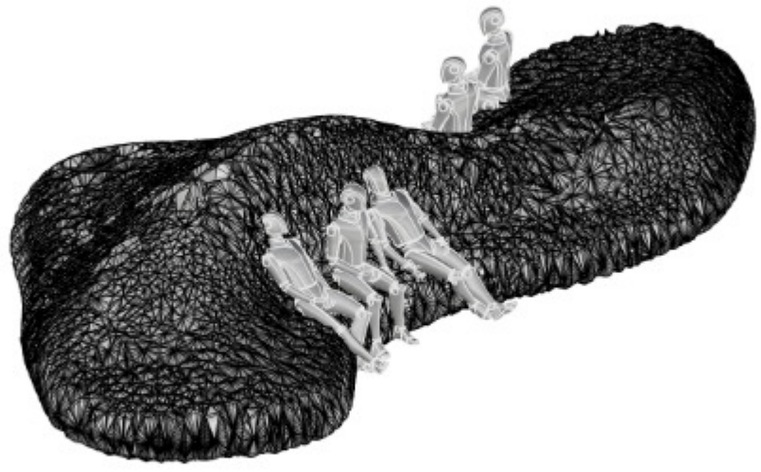
2.STRUCTURAL ANALYSIS



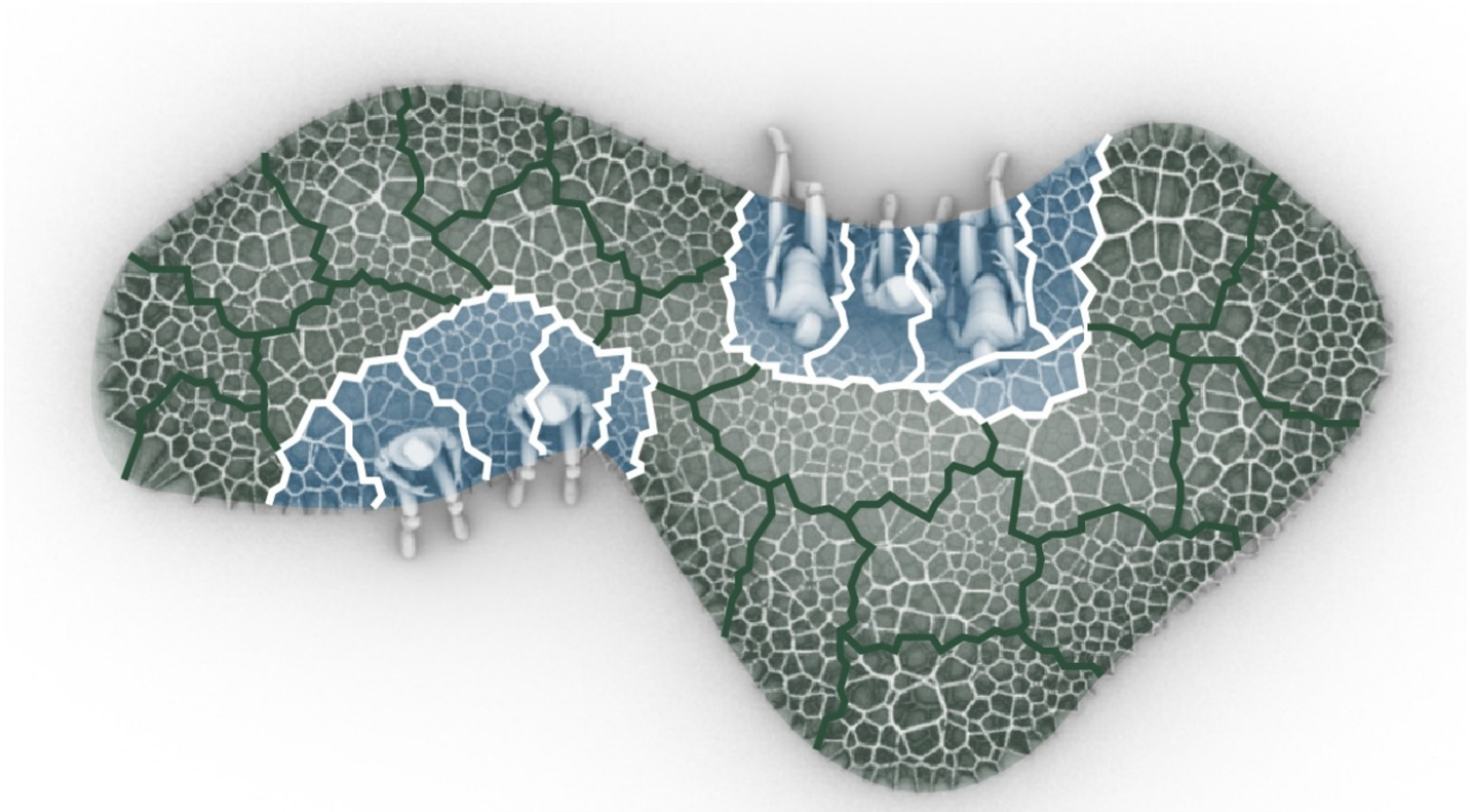
3.POINT CLOUDS



4.VORONOI MESHES



DUNE_COMPONENTIAL LOGIC



MATERIALS

STIFF WOOD FOR PLANTS

FLEXIBLE SEATING FOR PEOPLE

BIOPOLYMERS WITH DIFFERENT PERCENTAGE OF WOOD

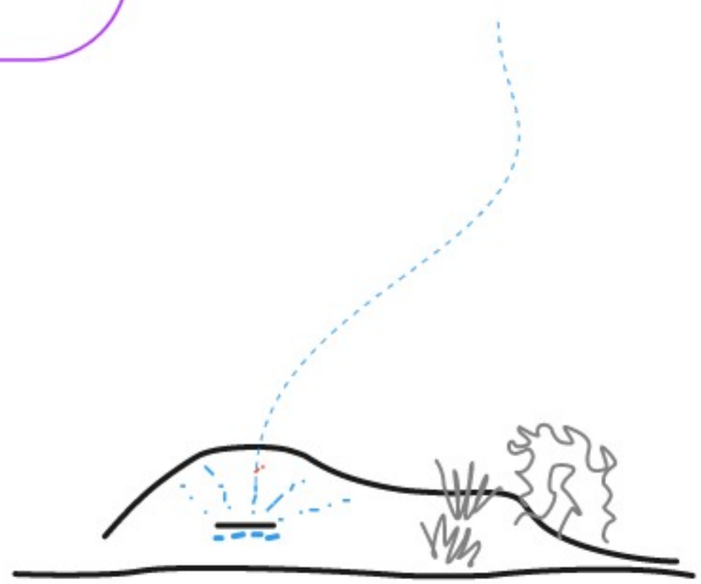
ROBOTIC OPERATIONS_INTERACTIVE GLOWING BENCH

INPUT

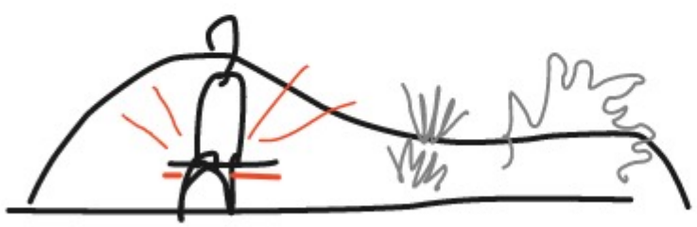
OUTPUT

PRESSURE — **INTERACTION** — **LIGHT**

PERSON



'CALLING' BENCH



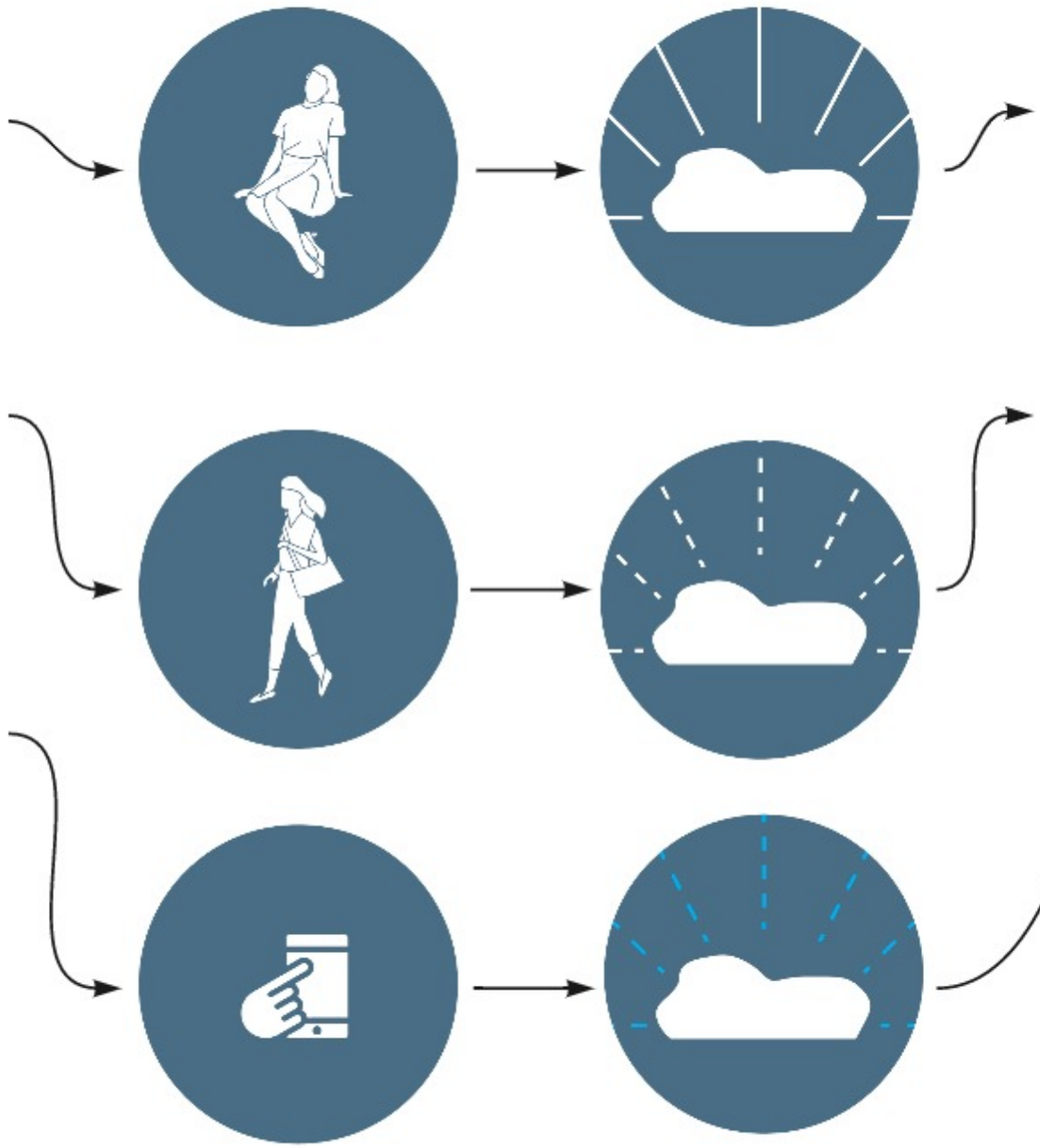
LOCATION A

LOCATION B

SENSORS_HOW TO DETECT A HUMAN

- **PRESSURE/HEAT** (when you sit on a bench)
- **MOVEMENT** (when you pass by - peripheral interaction - the bench is calling)
- **MOBILE APP** (when you want to send signals to someone)

3 types of furniture interaction

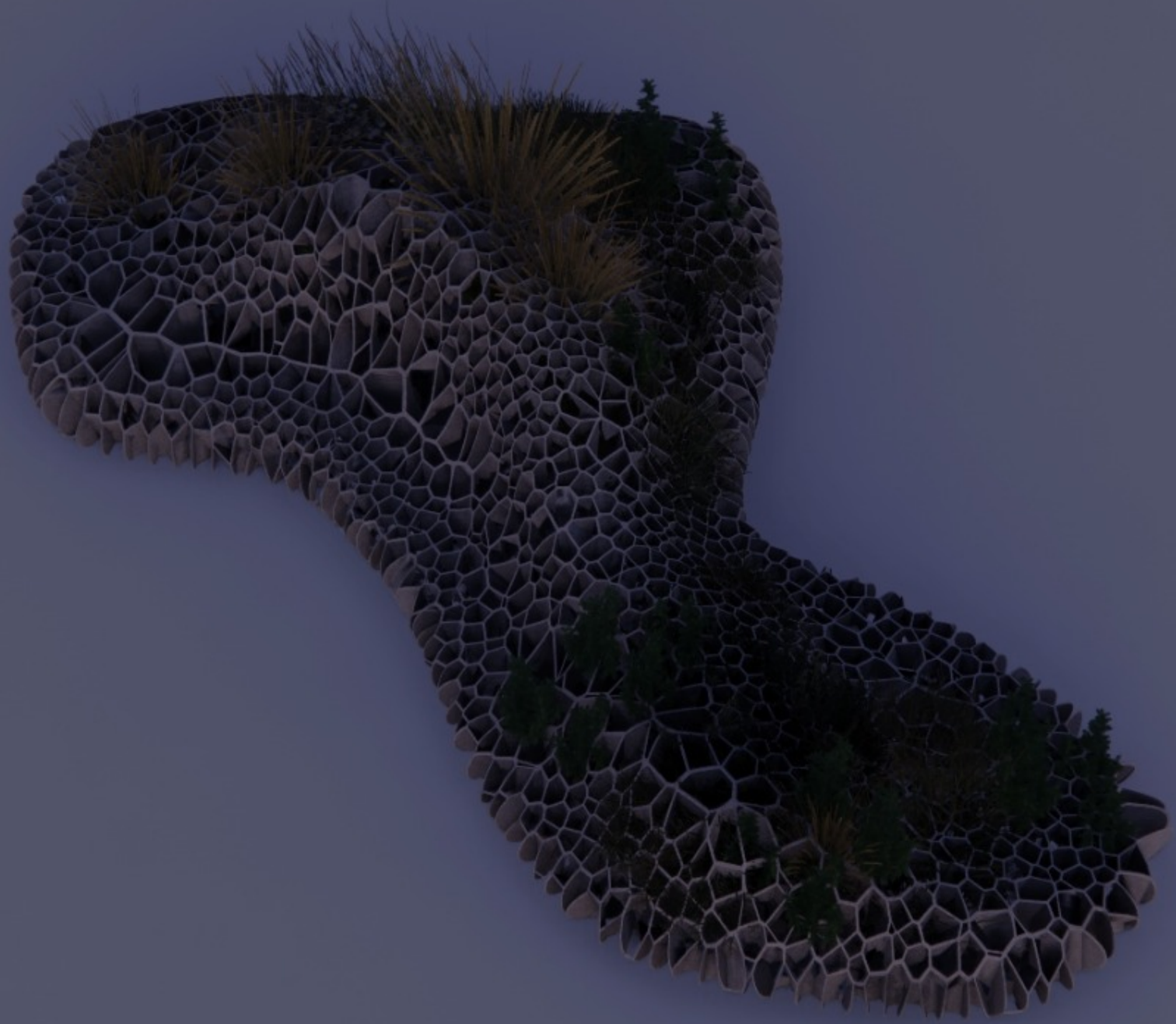


ACTUATORS

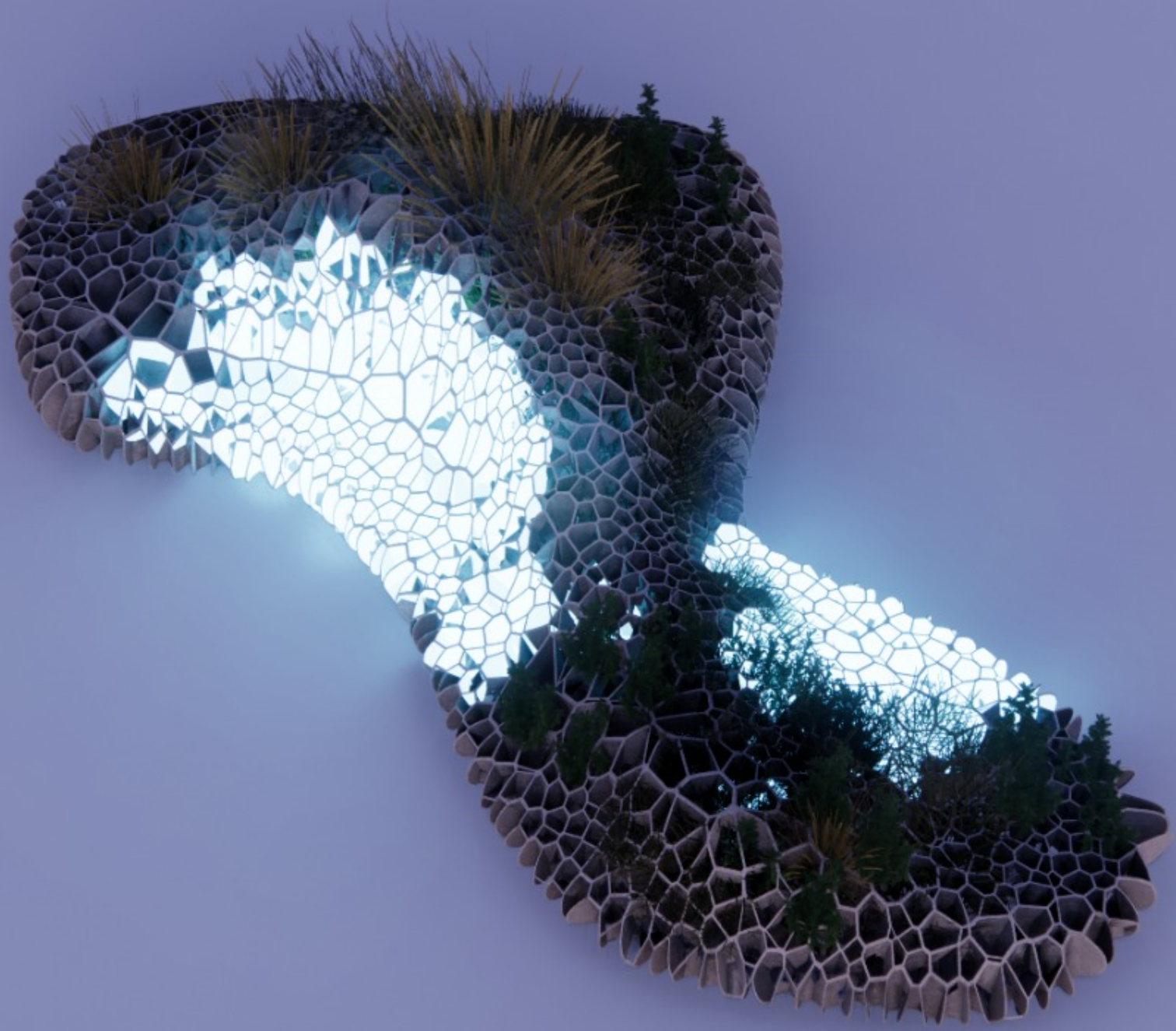
- LED LIGHT - **constant - white**
- LED LIGHT - **blinking - white**
- LED LIGHT - **blinking - blue**

3 types of light signals

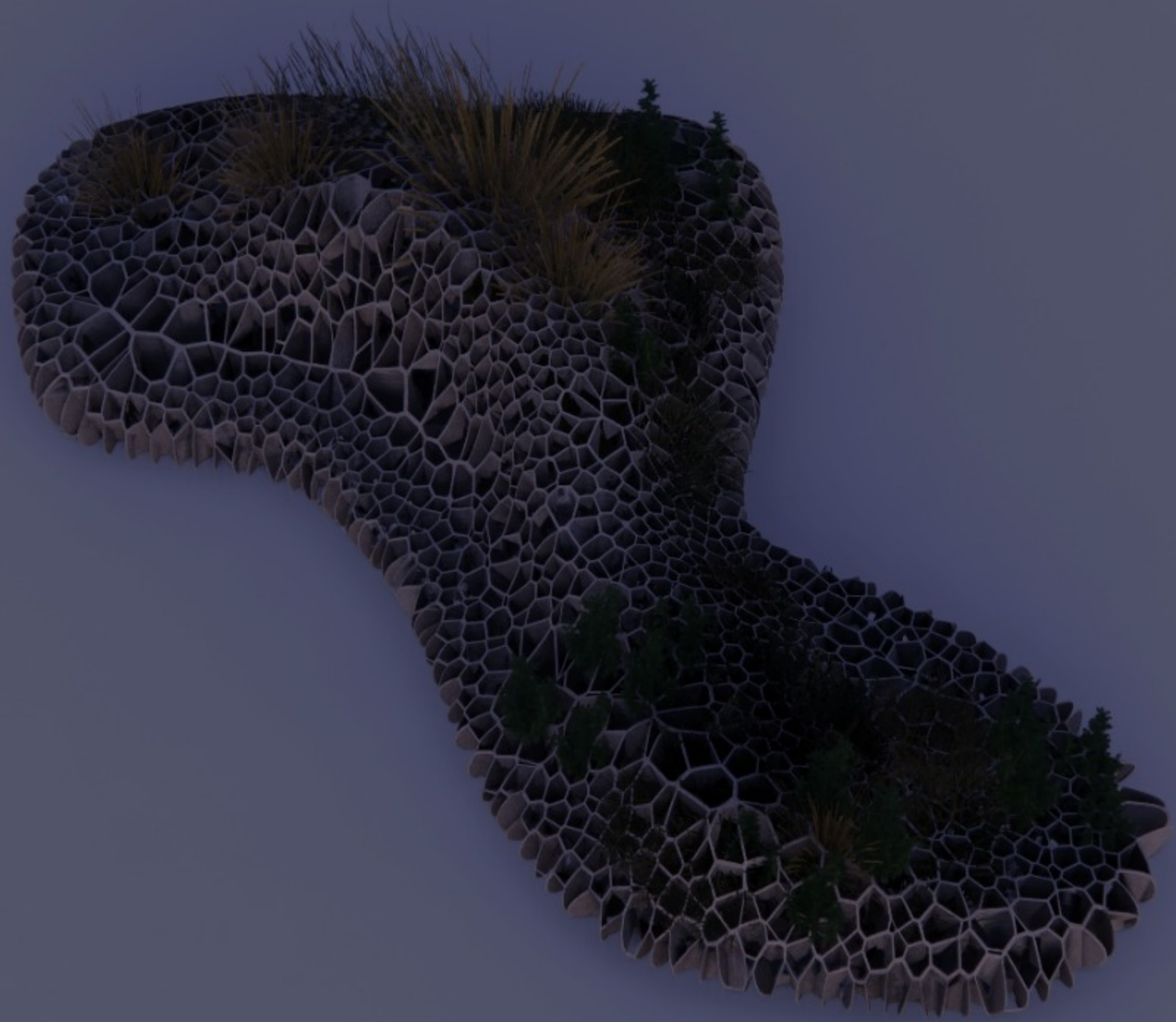
EMPTY BENCH



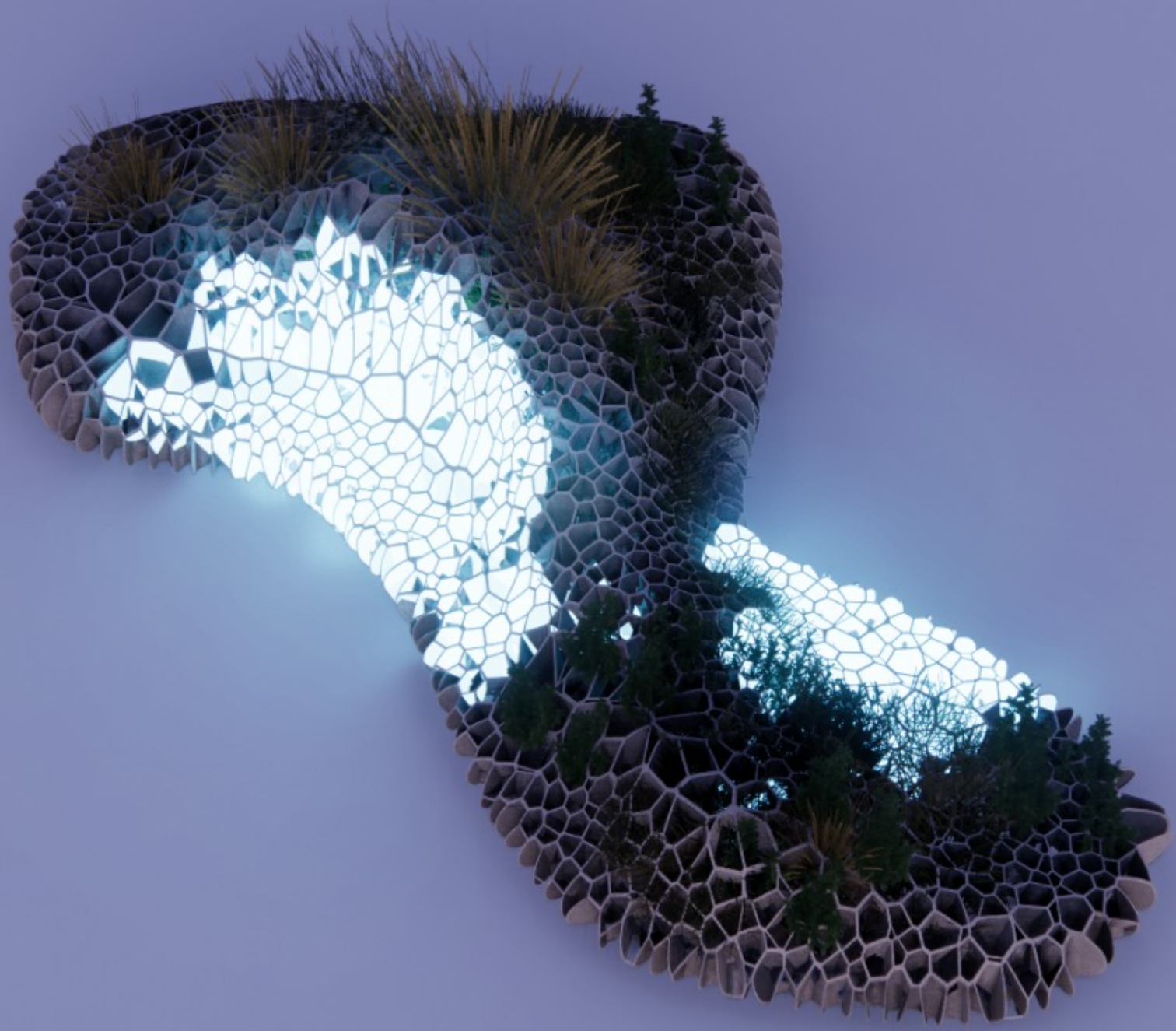
SIGNAL



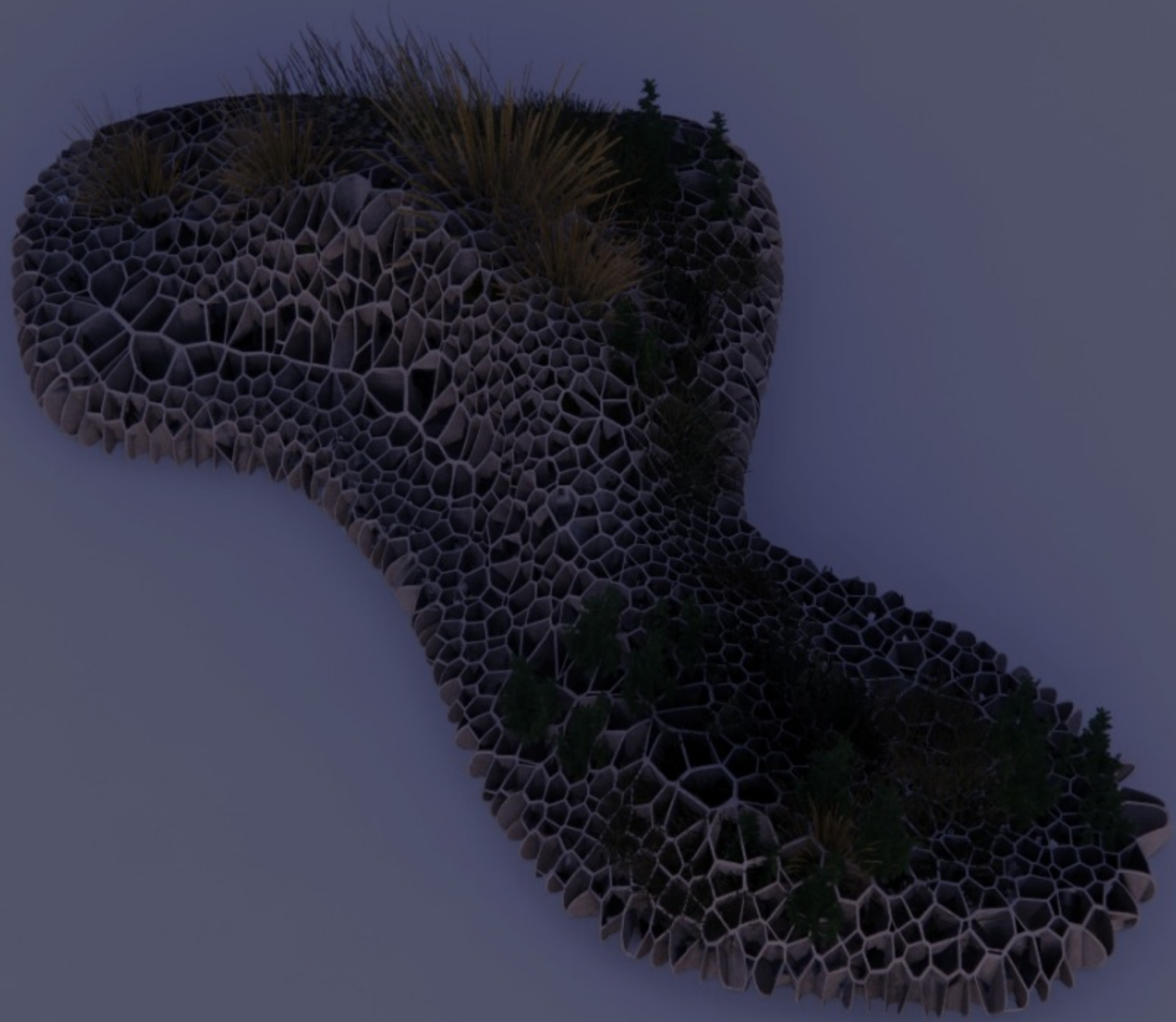
SIGNAL



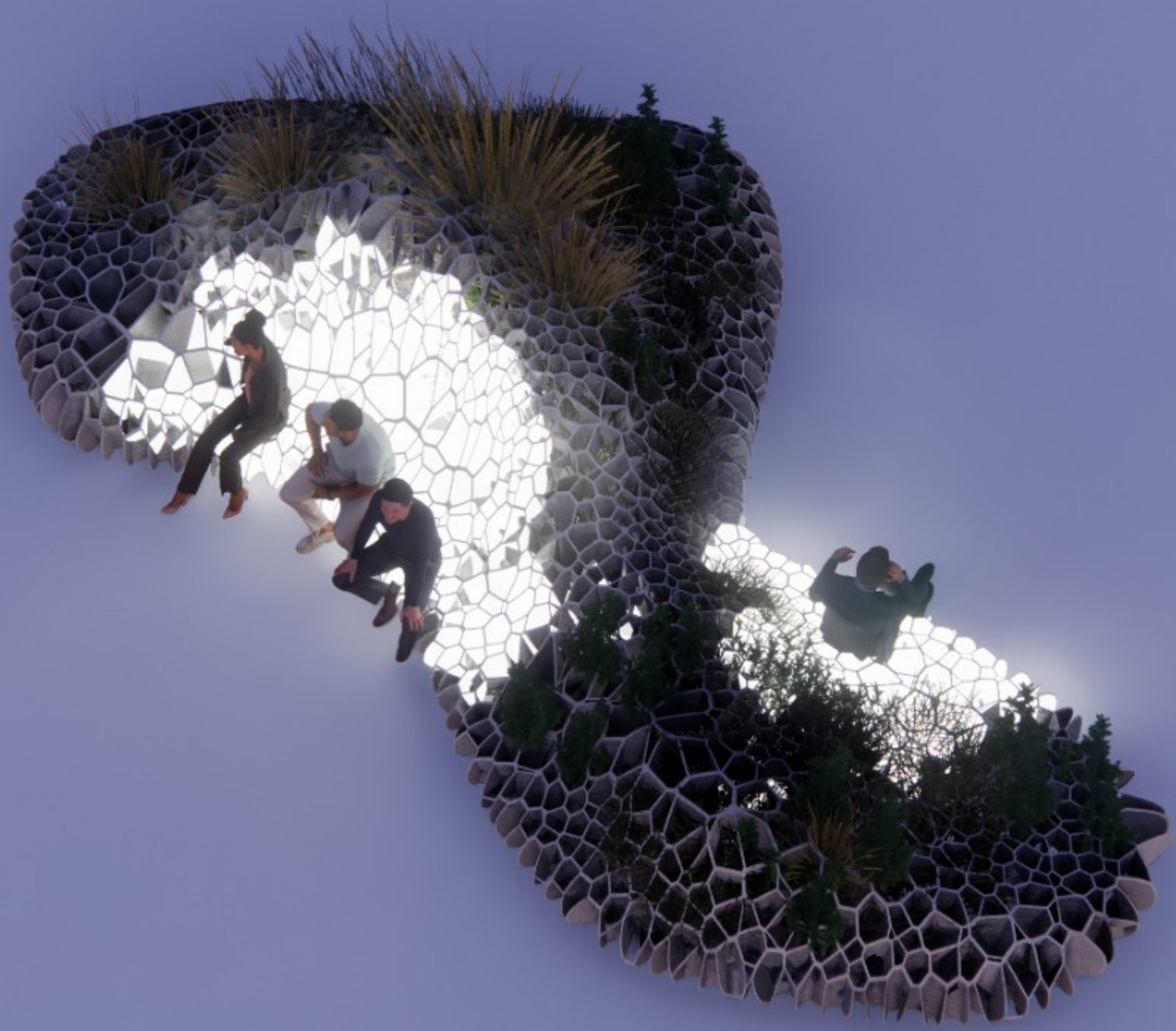
SIGNAL



SIGNAL



BUSY BENCH



LIGHTING OPTIONS

LED SURFACE LIGHT

LED STRIPES

ENVIRONMENTAL SENSORS AND ACTUATORS

1. **GATHERING ENVIRONMENTAL DATA** (humidity, noise etc)
2. **AIR QUALITY SENSOR** - QR code / notifications
3. **DRY EARTH SENSOR** - when plants need watering

BIO-DUNE

BIO-DUNE

BIO-DUNE

THANK YOU