

 Erida Bendo
PORTFOLIO

1. The Ringroad of Tirana, a liveable space master thesis 2019

2. Lagos Capillaries academic project 2021

3. Dream Blankets. academic project 2021

4. Ori/Kiri-gami explorations. 2021

CONTENT



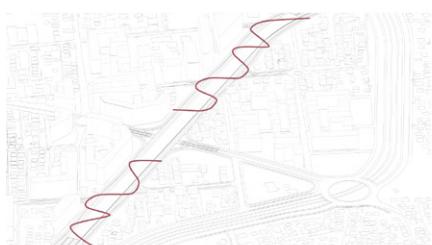
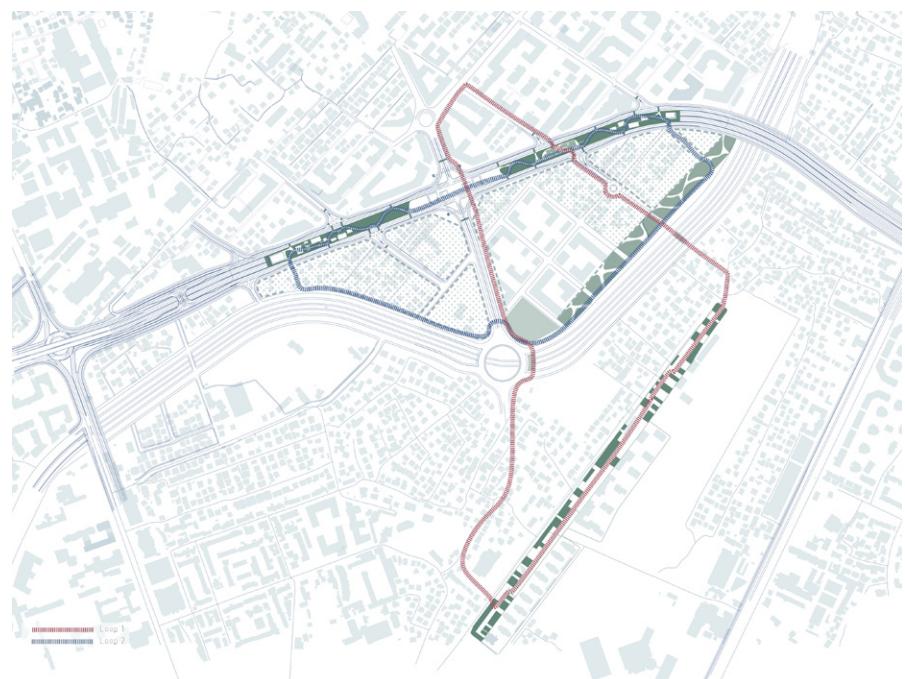
Masterthesis – September 2019
Polytechnic University of Tirana,
Faculty of Architecture and Urbanism

1. THE RINGROAD OF TIRANA, A LIVEABLE SPACE

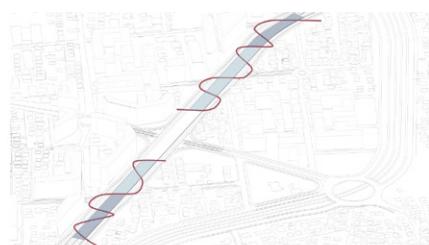
The 5th Ringroad of Tirana has been proposed in the General Plan in 1990, in a time when the city was very different from what it is today, and the proposed area was agricultural land. In this Plan the Ringroad was seen as the border of the city as well.

30 years have passed, and Tirana has been subject of a massive sprawl, with its suburban areas developing informally. The Ringroad now borders a very dense neighbourhood in its outer side, seriously affecting its existence.

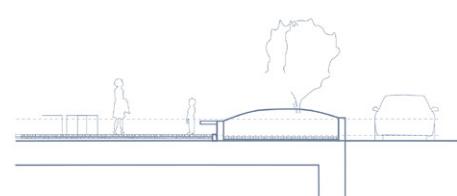
The proposed intervention seeks to ensure the communication between the two sides of the street, at the same time providing public space to this part of the city that clearly lacks it. In a large scale the proposed park is also linked to other systems of public spaces of the city.



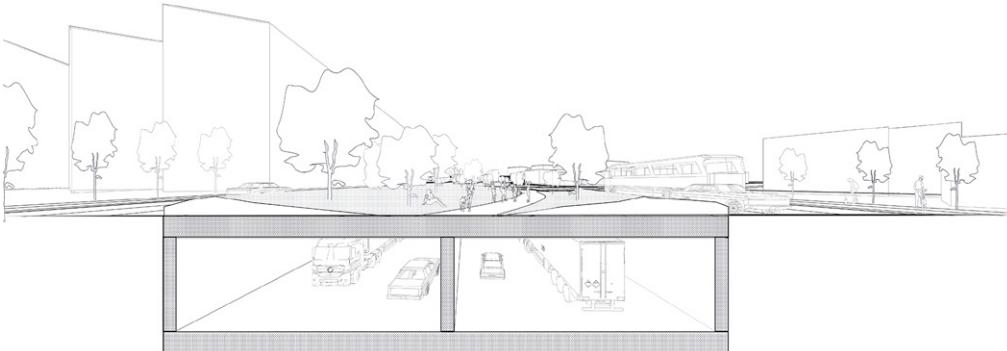
1. Mobility



2. Zoning



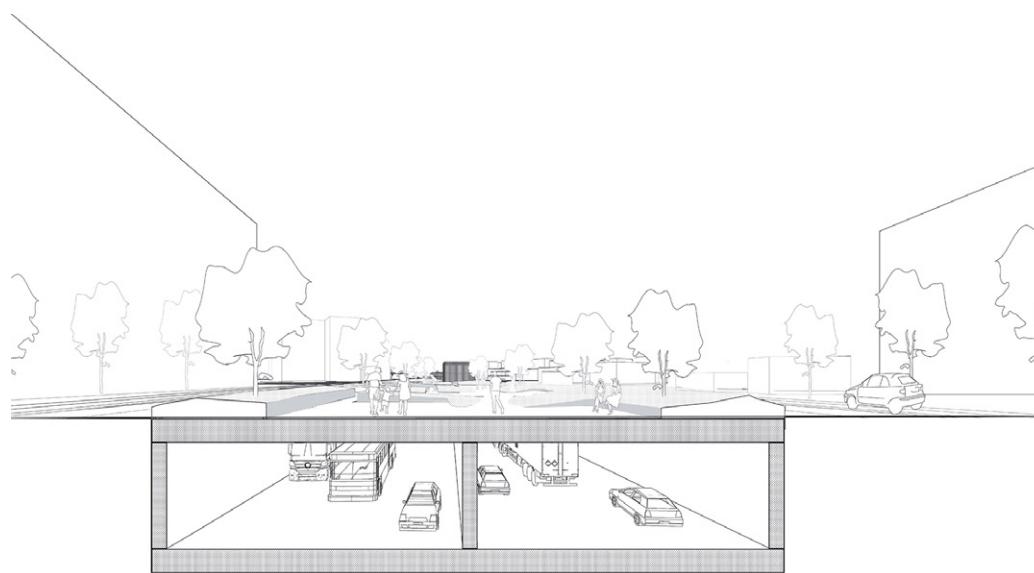
3. Relation to street



Pedestrian flows between the 2 sides of the ringroad become the main forming element for the space. Passages are placed at a distance of 150-200 m.

Zoning is affected by the proximity to the ringroad. In the edges sports activities are placed, while the rest includes quiet green areas.

The boundary between the park and the street is both physical and visual.



The public space takes the form of a linear park, in which two major interventions are made in the points where the park crosses the loops that link it with the other green spaces.

The first intervention will be a community center and a library, functions which confirm the idea of a polycentric Tirana expressed in its General Plan.

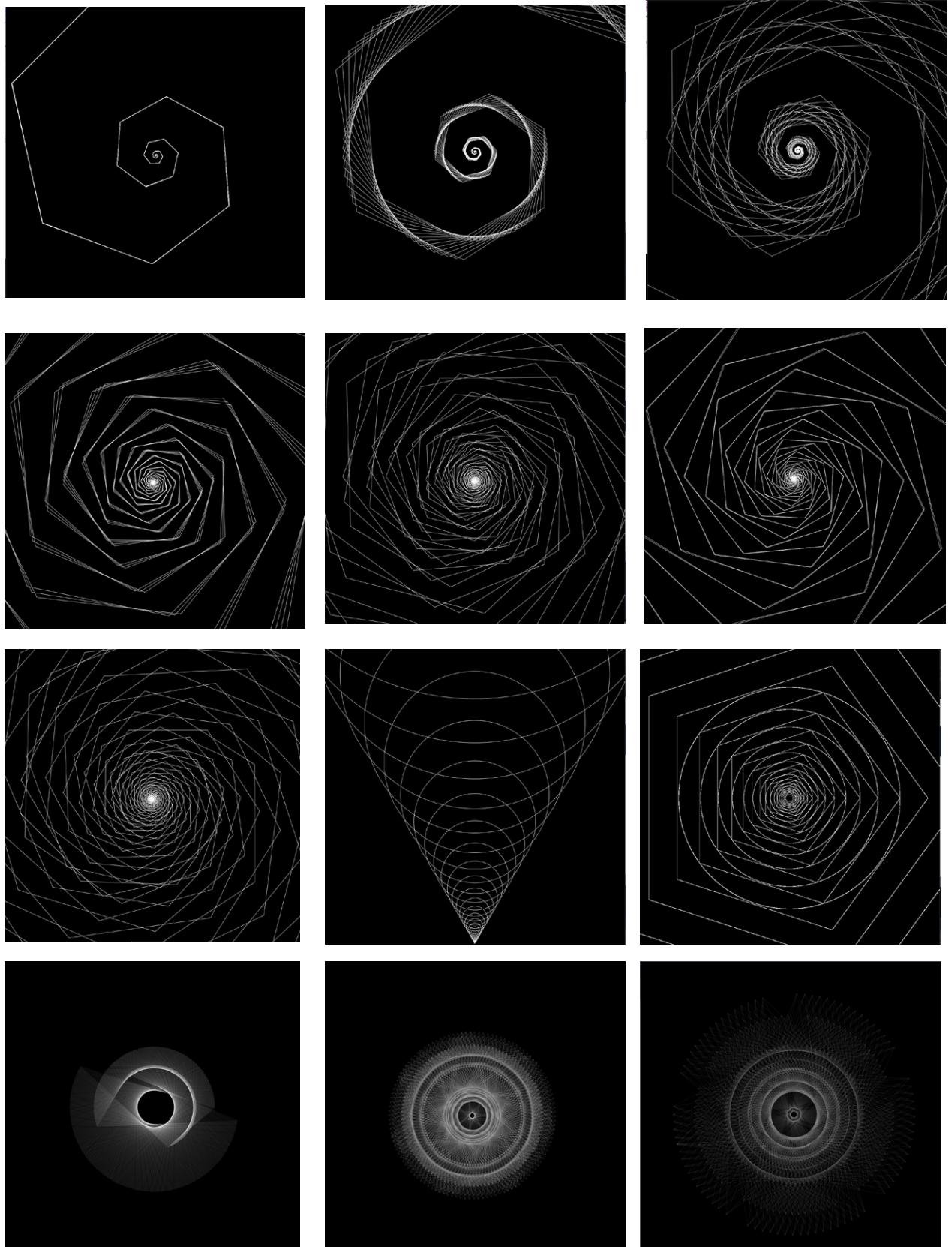
The second intervention will be a local food market, a commercial function but that contributes to the community life. The rest of the linear park is designed in a more fluid way in order to diminish its linearity.

Community center

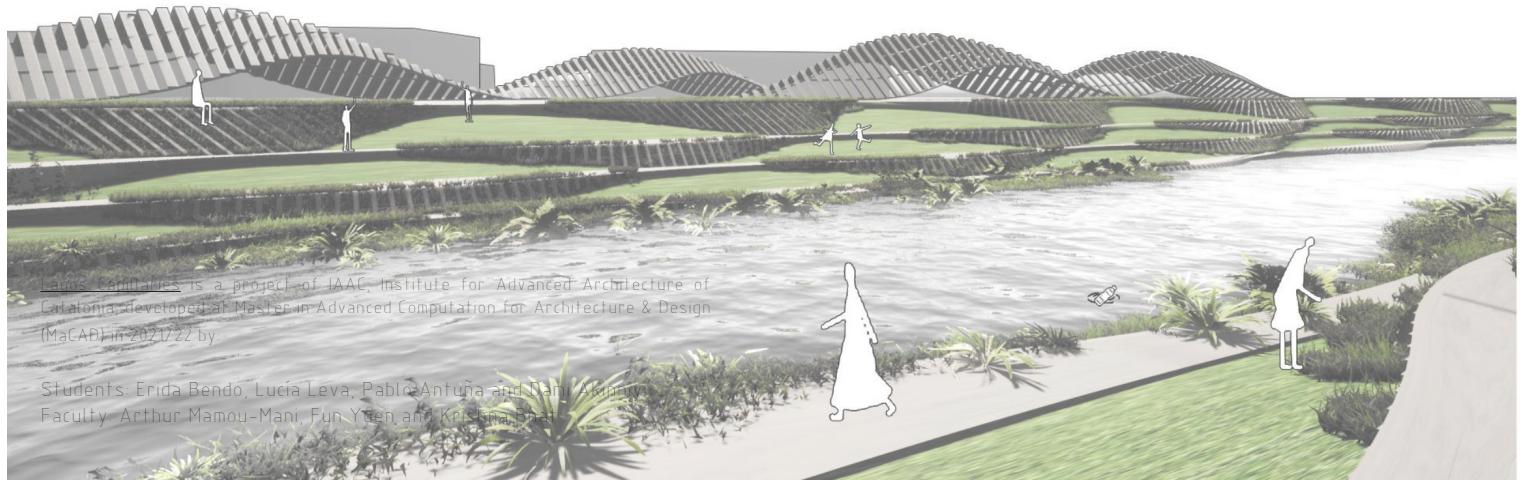


Food Market





Some sketches done in Processing...



Lagos Capillaries is a project of IAAC, Institute for Advanced Architecture of Catalonia, developed at Master in Advanced Computation for Architecture & Design (MaCAD) in 2021/22 by:

Students: Erida Bendo, Lucía Leva, Pablo Antuña and Dami Maimon
Faculty: Arthur Mamou-Mani, Fun Yuen and Kristina Behr

<https://www.iaacblog.com/programs/lagos-capillaries/>

2.LAGOS CAPILLARIES

naturalisation of the concrete drainage canals of Lagos:

×responsible for the design of the embankments and pavillions.



Waste collection & water purification



Environment rewilding



Strengthen community

Lagos Capillaries is a project exploring the naturalisation of the concrete drainage canals of Lagos, Nigeria, within the framework of rewilding while creating spaces for community integration and productive urban landscapes for farming.

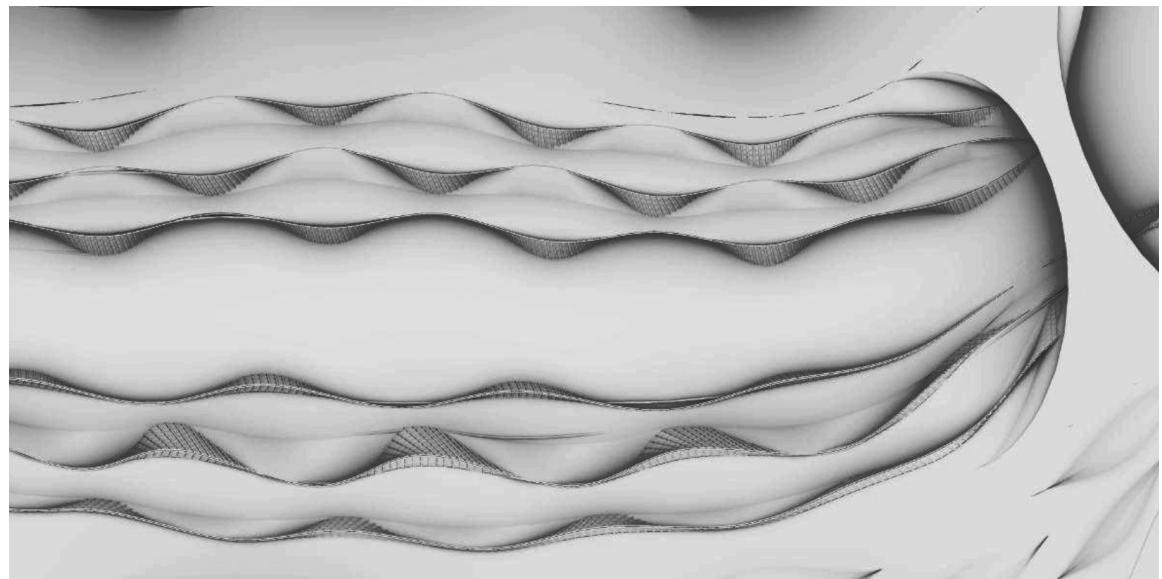
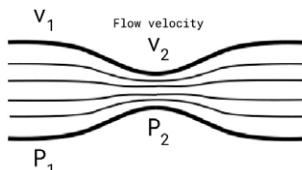


Our first step towards terraforming the canal landscape was to optimise the canal geometry and have it work for our rewilding and community integration goals. We sought to redefine the upper and lower boundaries, and established connections in areas where the canal disconnects communities.

For the upper boundary, we wanted to maximise the setbacks and land area of the canal while minimising its length. With these goals, we ran the canal geometry through an evolutionary solver to find an outline that best meets our fitness goals.

Bernoulli's principles are referenced for establishing the lower boundary.

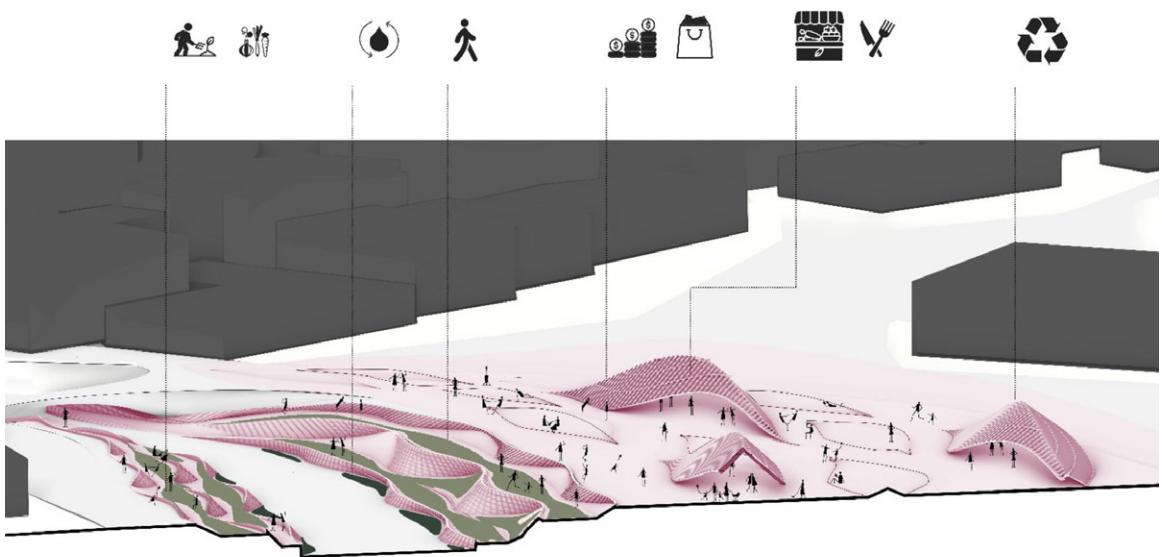
The narrower areas will have higher water velocities and will be water aeration zones and the wider areas will have slower water velocity and lamina flow which will get oxygenated water good for supporting flora and fauna. These narrower areas were planned under the bridges and wider areas in between bridges.



Three key points establish our approach to the canal bed area. Our intervention seeks to structurally reinforce the river banks, allowing spaces for bioremediation and urban farming.

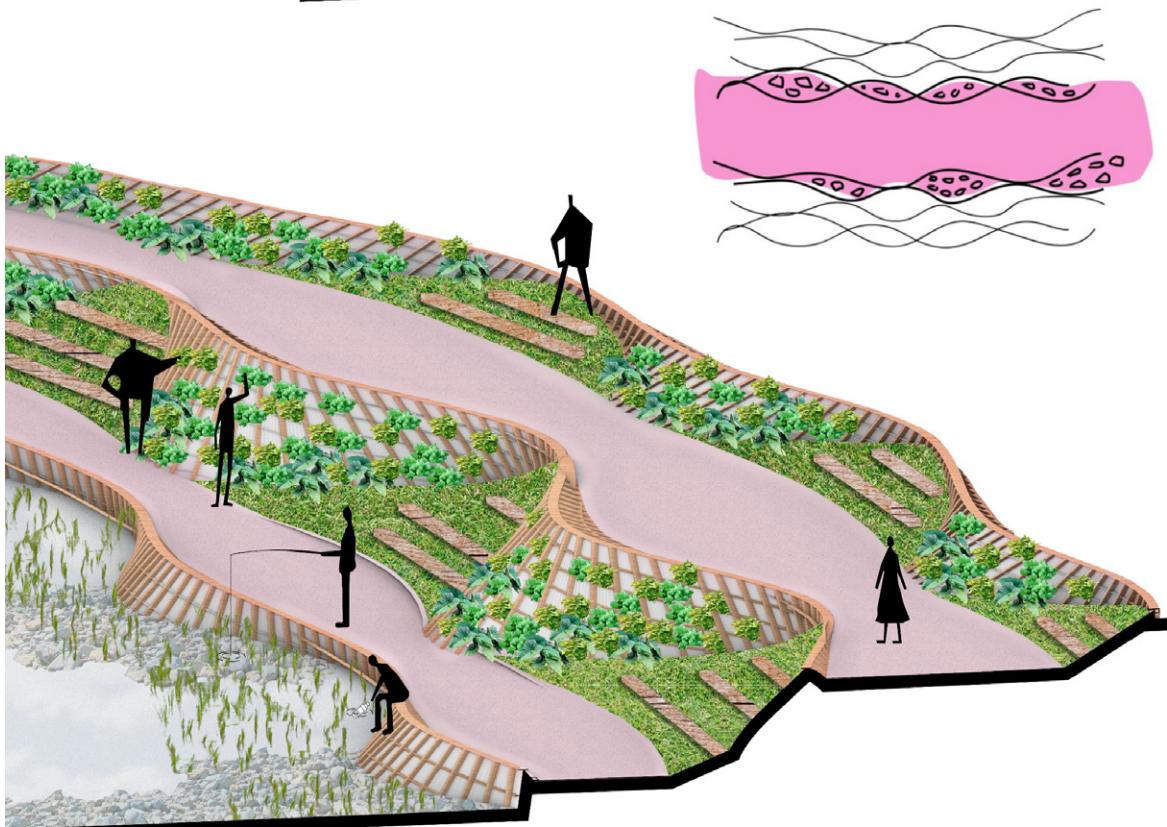
We are inspired by braided river patterns, as a terra forming strategy, organically dividing spaces of different use.

Starting from woven curves a script is further refined into producing curved embankments. A variation which allows appropriate average surface for farming crops and that blends to the scale of the site is selected.



These woven curves, embedded below water level, are a final lattice module for a natural waste filter system. Here, rock boulders are arranged on a gravel bed within this unseen lattice such that waste gets trapped in the spaces between the rocks.

The riverbank becomes a new wetland ecosystem with plant and animal species native to Lagos. It will function as nature's kidneys by removing pollutants from the water. In addition, active bioremediation strategies included bio-attenuation by introducing bacteria and nutrients to mineralise organic pollutants.



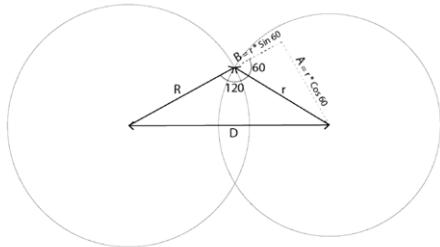


3.DREAM BLANKETS

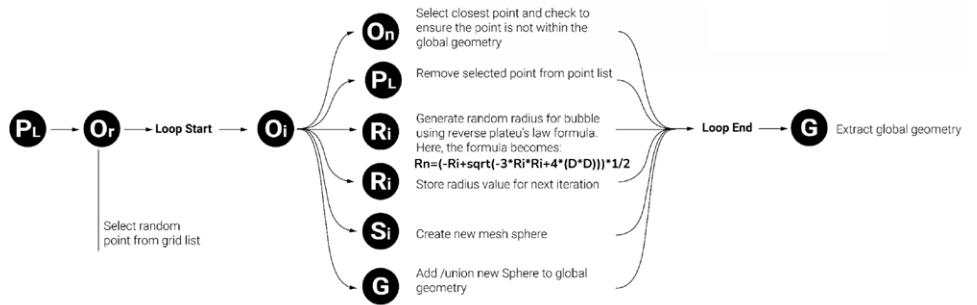
×responsible for the bubble research and optimization processes

01 Natural Systems & Computational Strategies Research

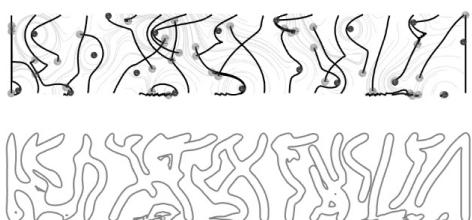
Bubble cluster formation workflow



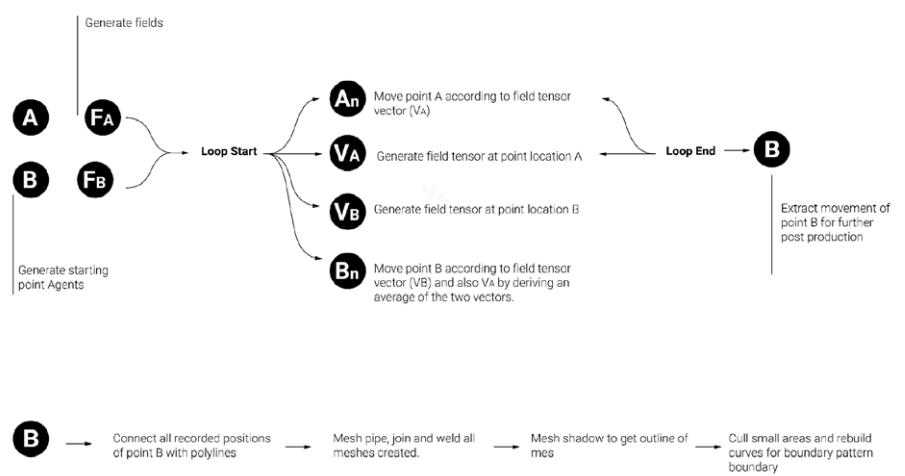
based on the geometric constraints of Plateau's laws for stable bubble clusters



Self organising system workflow



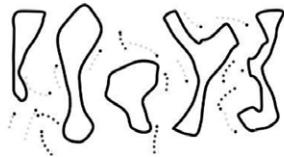
our Reaction-Diffusion interpretation



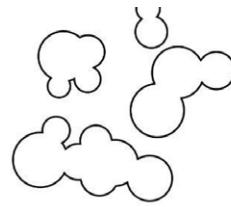
This workflow, employs a direct interpretation of the activator-inhibitor system. We started with two sets of agents moving within different vector fields.



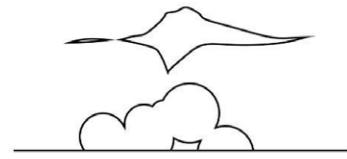
02 Design development



01 Generation of maze



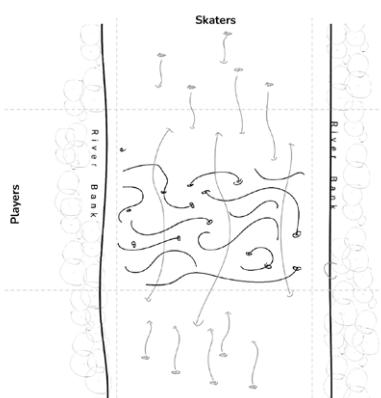
02 Bubble clusters



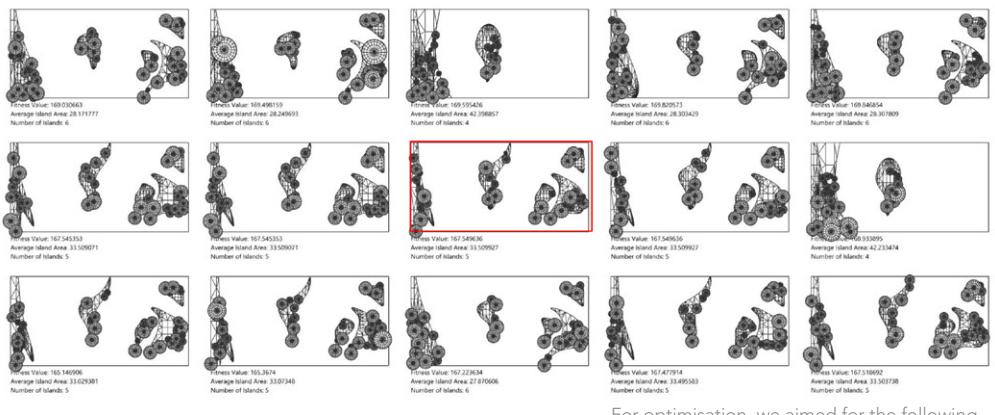
03 Draping through Kangaroo

We will be exploring strategies for form-finding and optimisation of 'warming-hut' pavilions located along the frozen Red River in Winnipeg, Manitoba.

We propose to construct a pavilion which would act as a 'warming hut'. a structure where visitors and passersby can rest and take shelter from icy winds, while playing and skating through in the long winter months of Northern American continent.



To generate the cluster islands for bubbles, we adopted our interpretation of self organising systems where agents A are seen as players and agents B skaters.



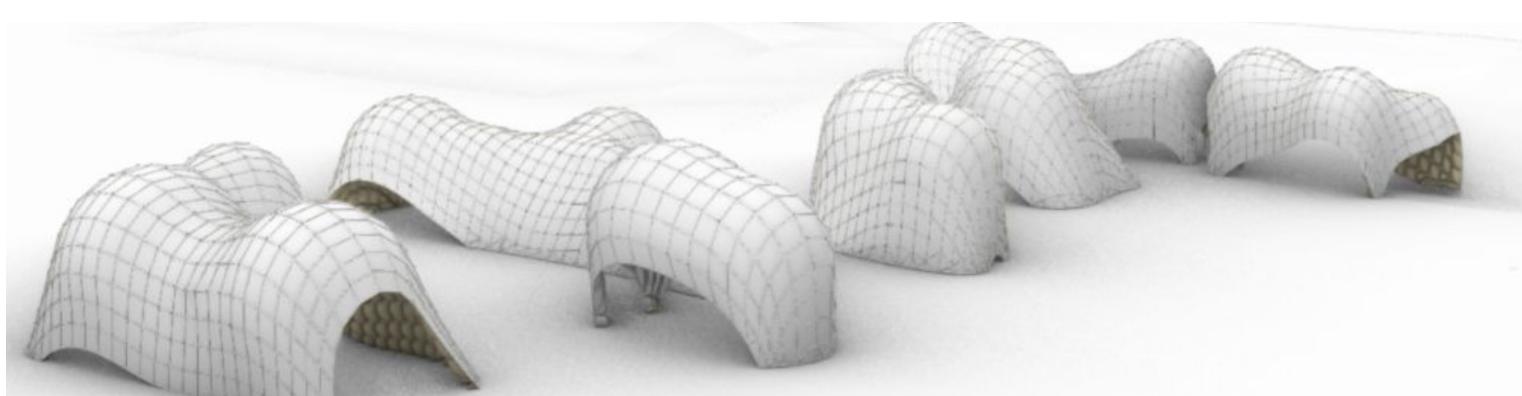
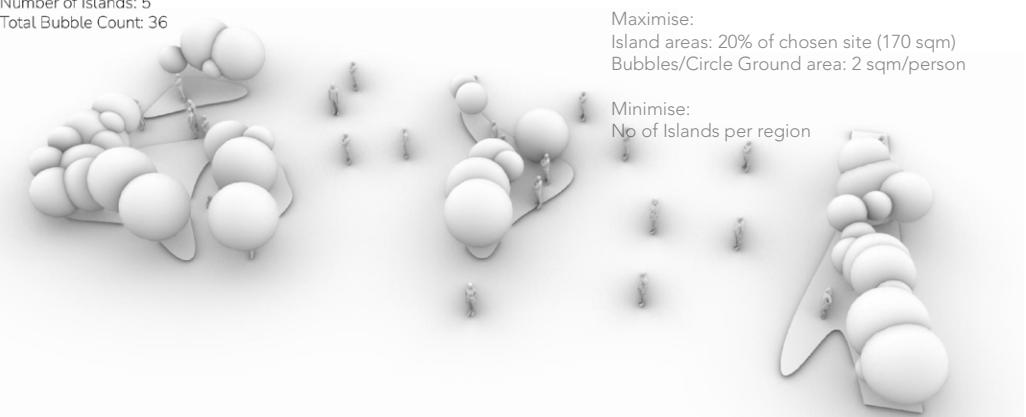
For optimisation, we aimed for the following fitness values

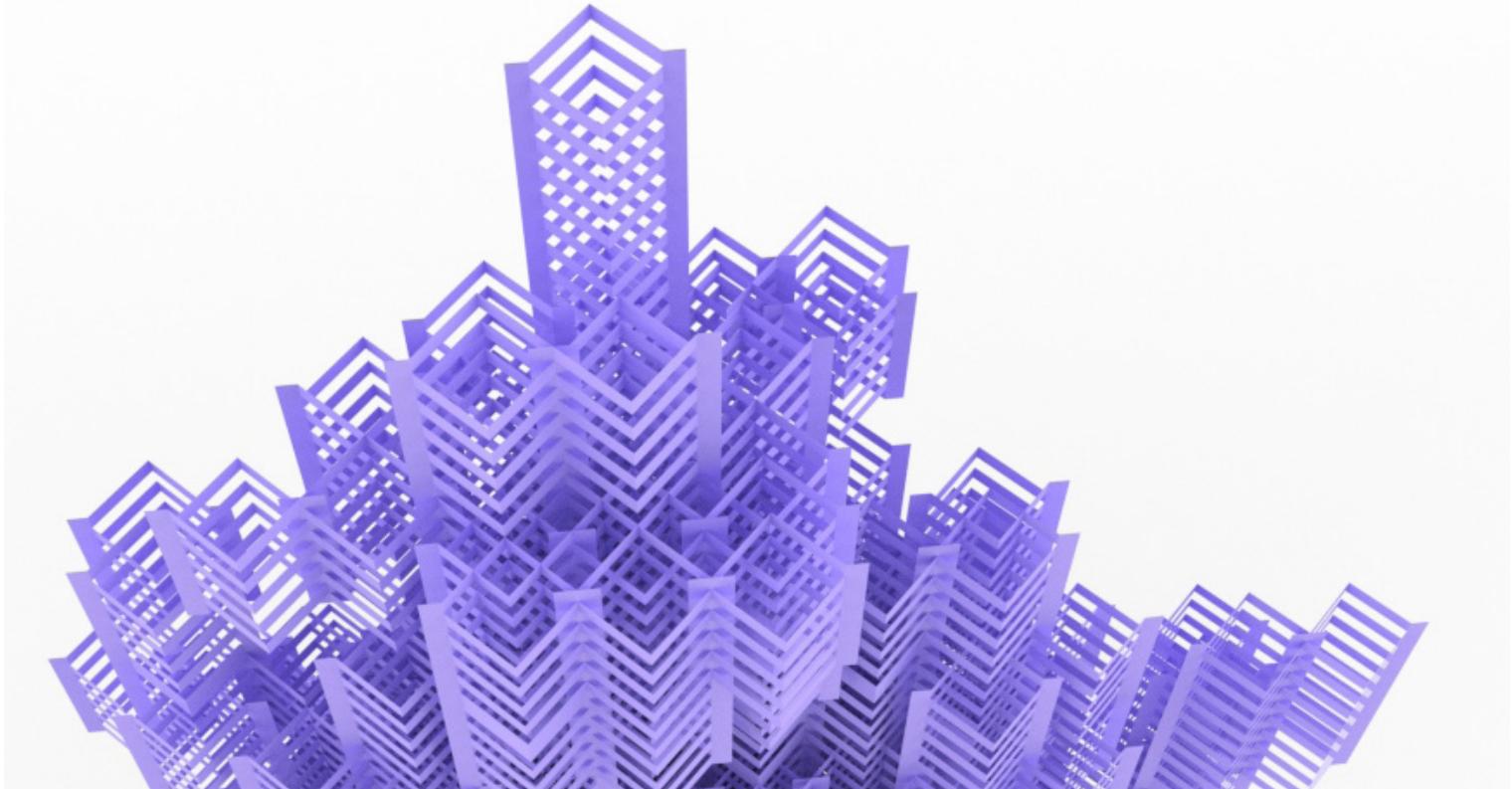
Maximise:

Island areas: 20% of chosen site (170 sqm)
Bubbles/Circle Ground area: 2 sqm/person

Minimise:

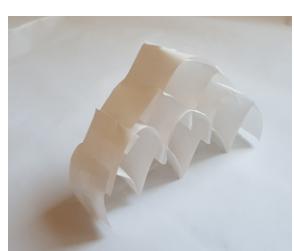
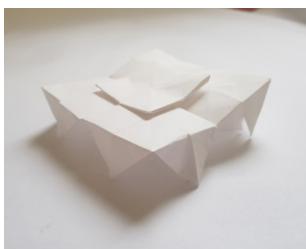
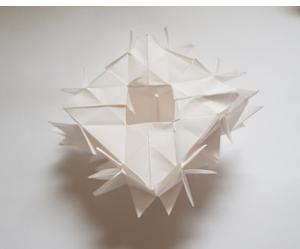
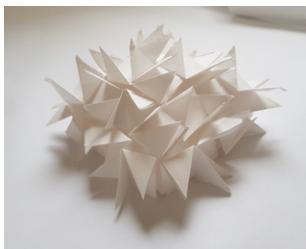
No of Islands per region

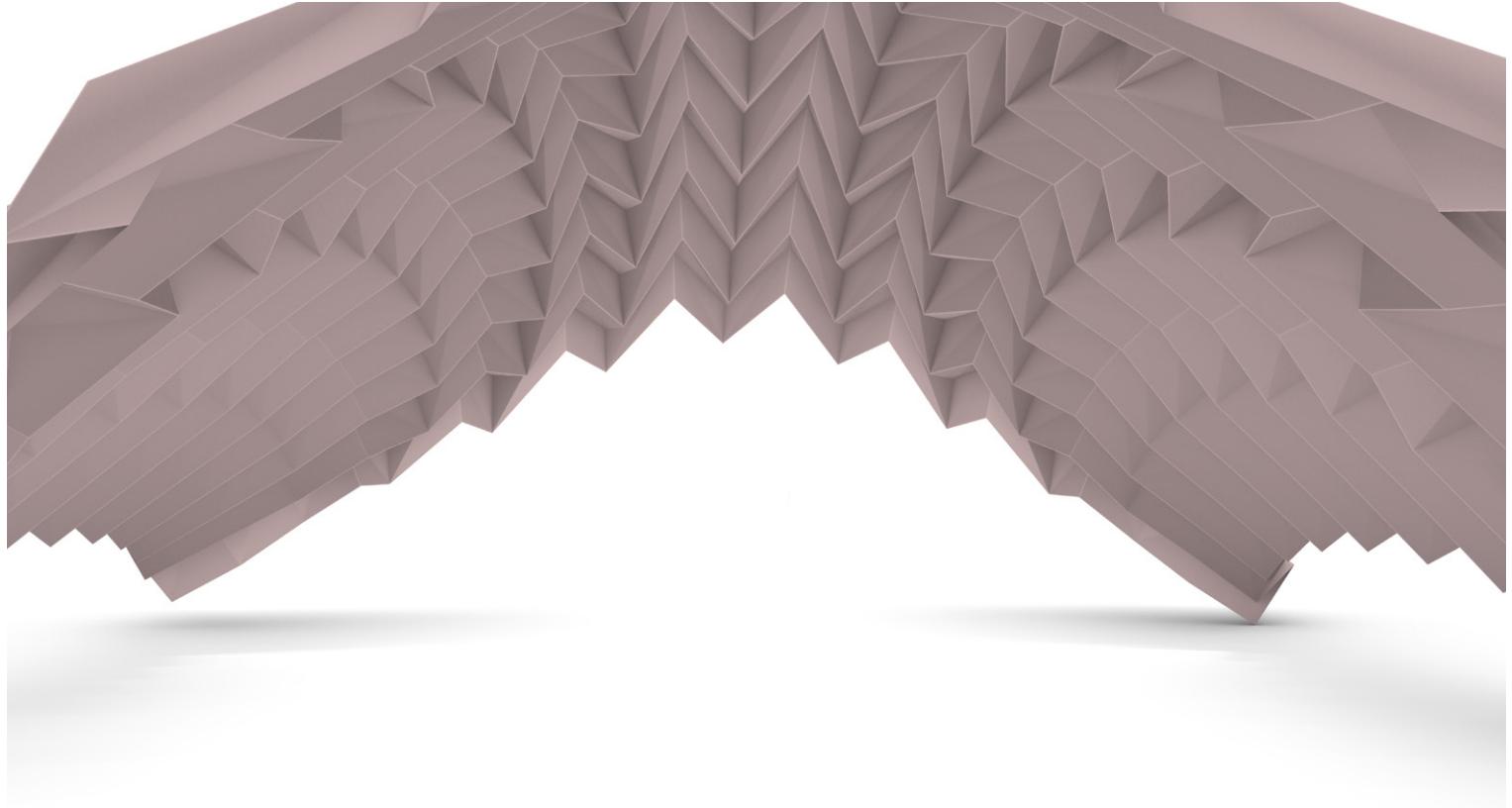




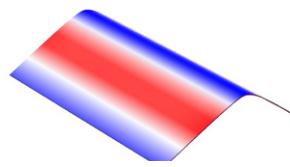
4. ORI/KIRI-GAMI EXPLORATIONS.

exploring the potential of creating building blocks out of sheets.
(easy fabrication - complex geometries)

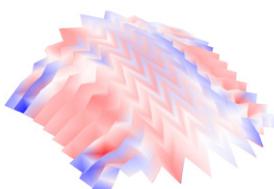




3. Origami explorations



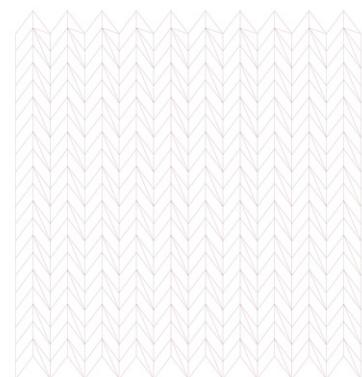
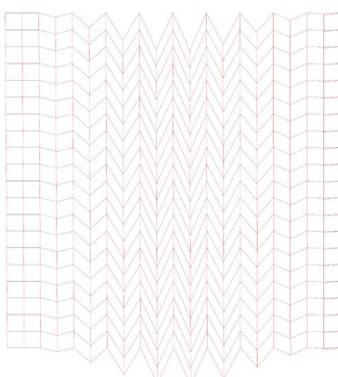
Flat paper



Folded state

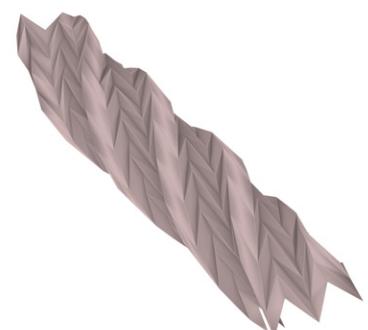
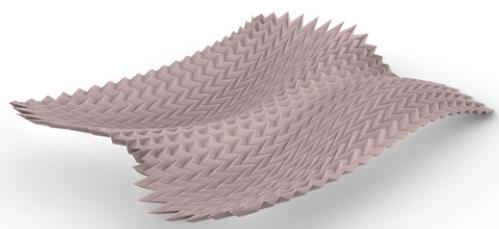
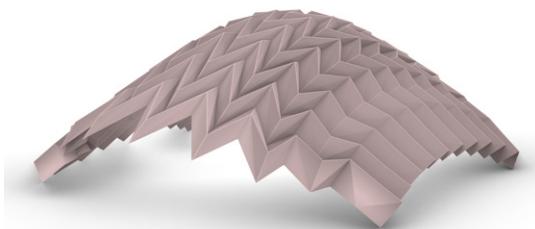
Miura-ori derived crease variations that create curvature inspired by Tomochiro Tachi's work on rigid origami

The folding created balancing forces of compression and tension overall lowering the utilization of the material. Exploring these variations of tessellations creates the potential of using material responsibly, without waste.



Crease patterns

Folded state generated in GH



Thank you

