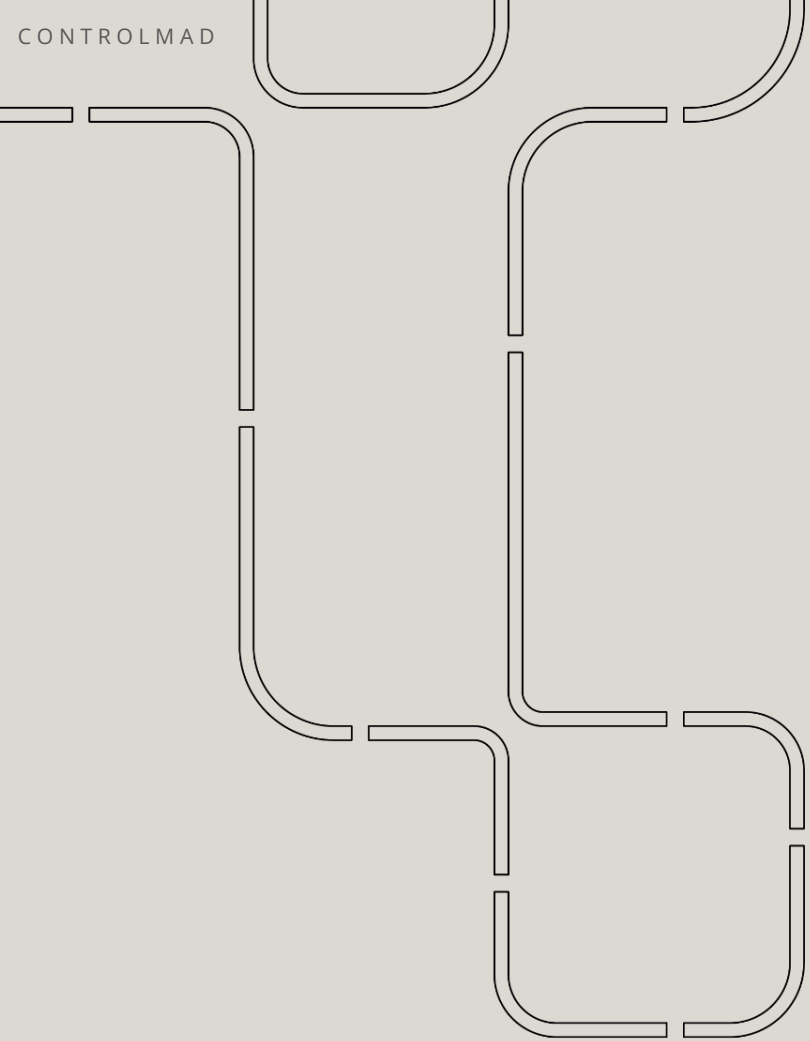
WORKSHOP JULY 2024

DIGITAL FABRICATION SYSTEMS

CONTROLMAD



THE TEAM

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Sergio Alonso del Campo
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PROJECT BRIEF

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GRASSHOPPER | BRIEF SUMMARY
FINAL MODEL

PRODUCTION

3D PRINTING
MILLING
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RESULT

PROJECT BRIEF

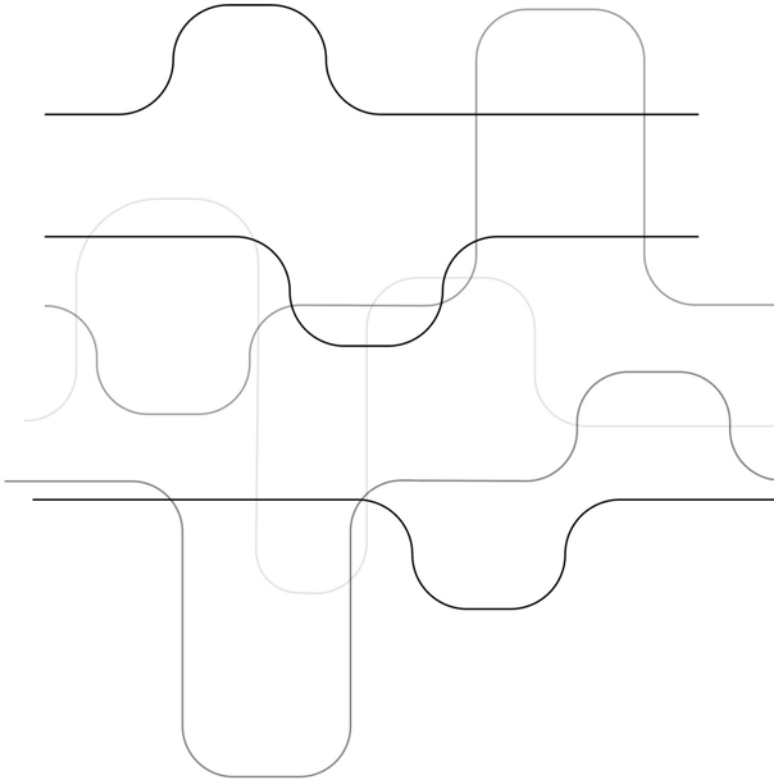
At the Controlmad Advanced Design Center, we embarked on a project to design and construct a shelf specifically for housing pots and plants at the entrance of the Controlmad Fablab.

Grasshopper was instrumental in the design phase, enabling us to explore complex geometries and optimize the structure for various plant sizes and types. We employed CNC-ing and 3D printing to create the shelves with precision and efficiency.

DESIGN

An initial sketch was created in Illustrator to serve as the foundation for developing the Grasshopper patch.

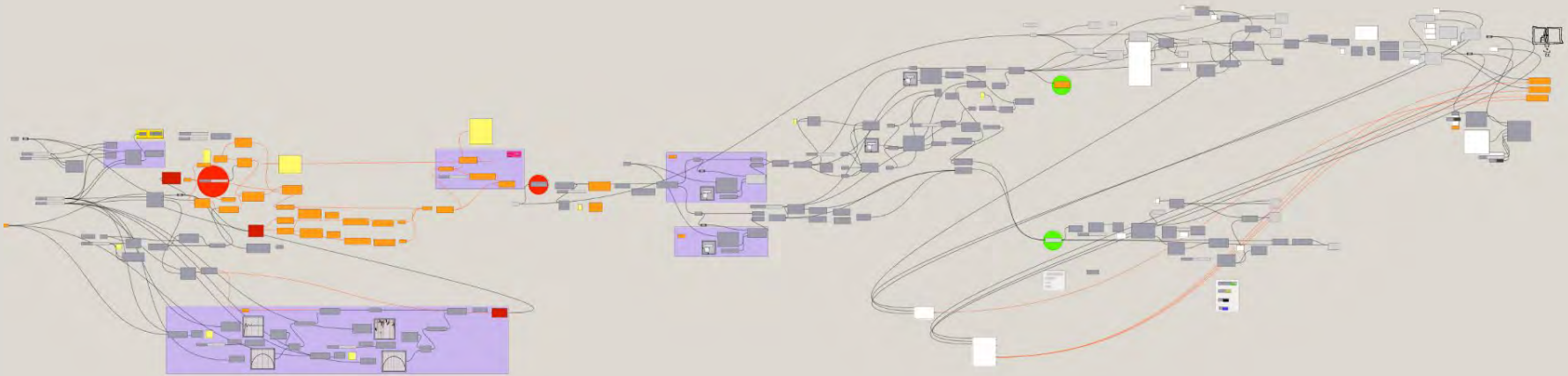
This sketch provided a visual guide and conceptual framework, outlining the desired intricate interplay between the lines.



GRASSHOPPER

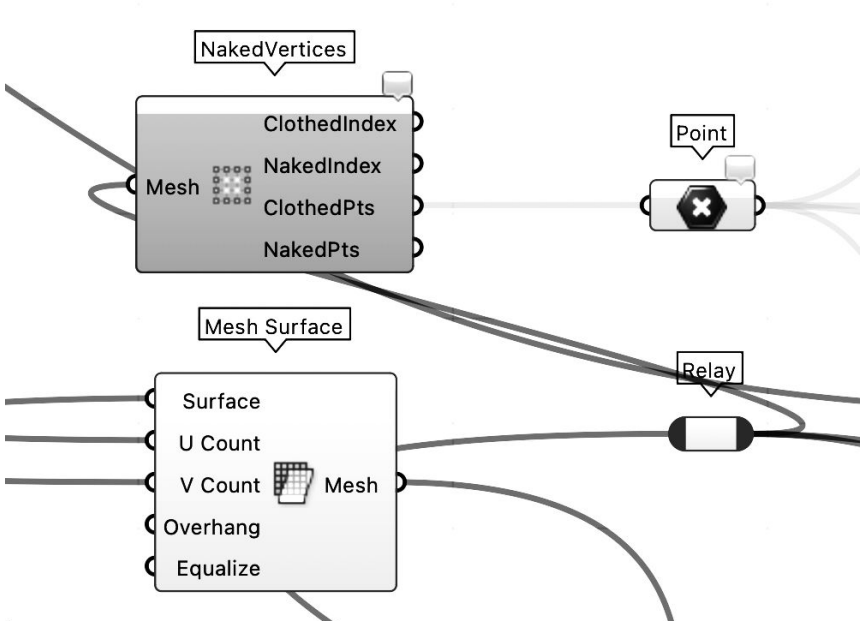
Various techniques in Grasshopper were employed to create the final model.
The following slides will highlight some interesting details of the patch.

PATCH OVERVIEW



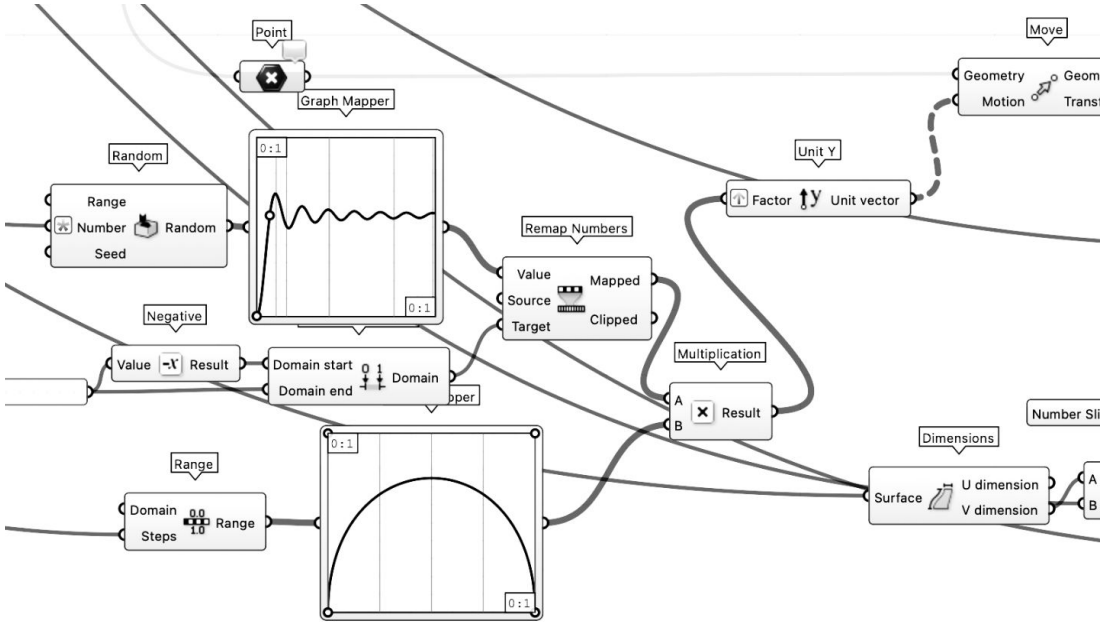
GRASSHOPPER | THE GRID

We started by creating a simple grid of points.



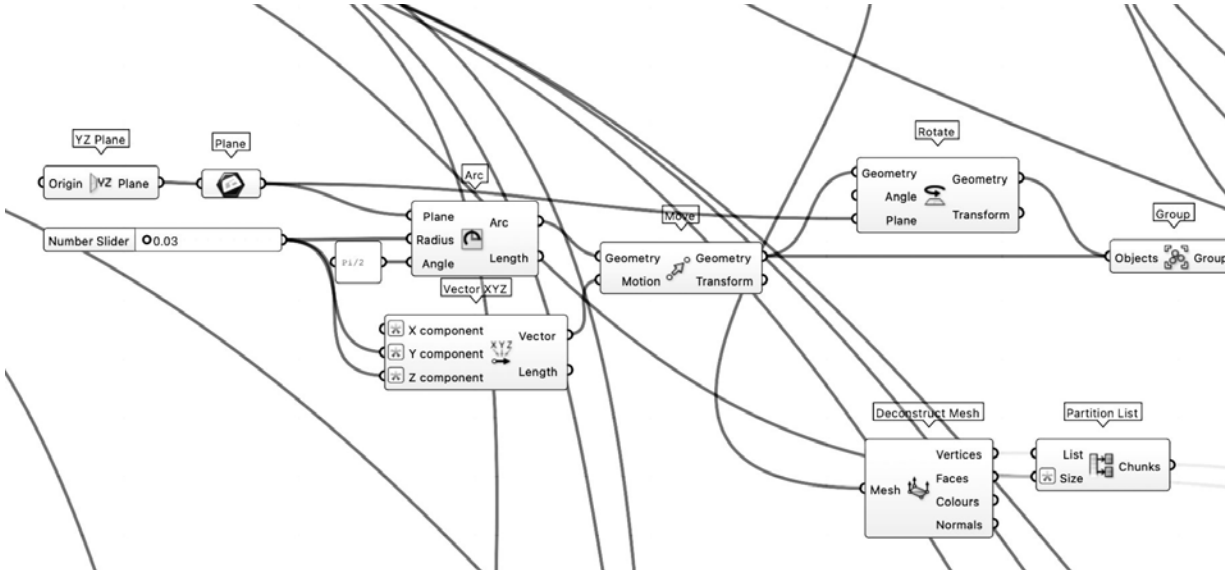
GRASSHOPPER | MOVING THE GRID

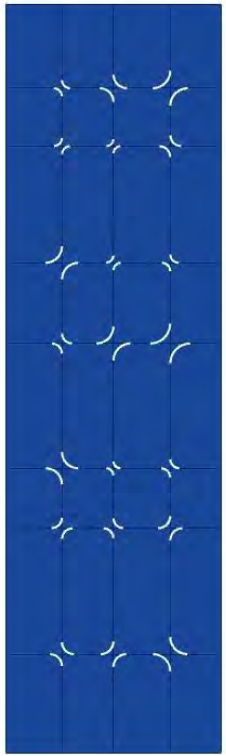
The X and Y positions of the points can be adjusted vertically or horizontally to disrupt the grid, resulting in more irregular shapes.



GRASSHOPPER | THE JOINTS

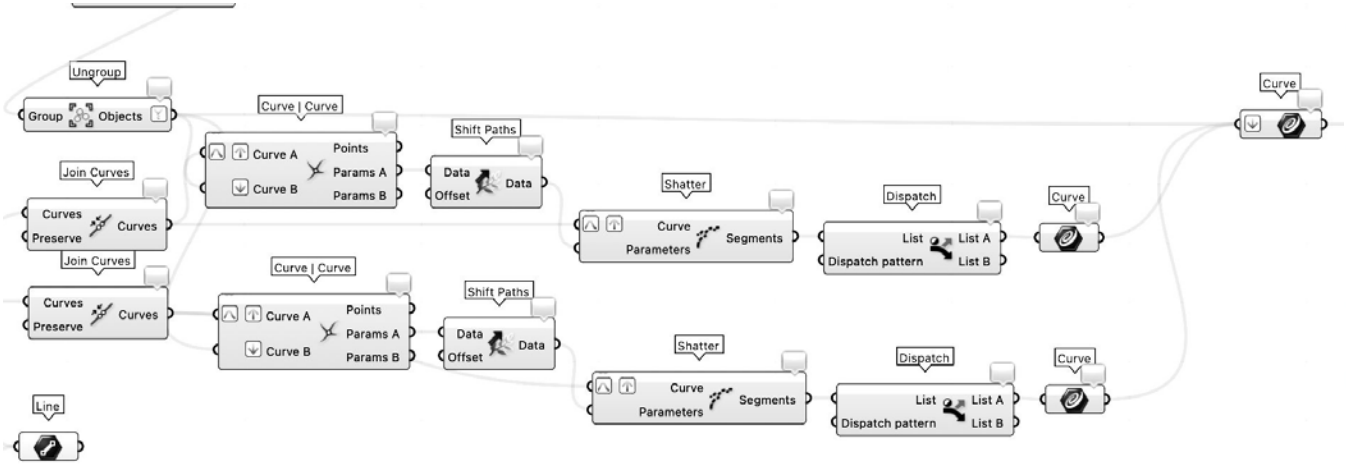
The origins of the points were used to position the arcs, which would later form the rounded shapes.

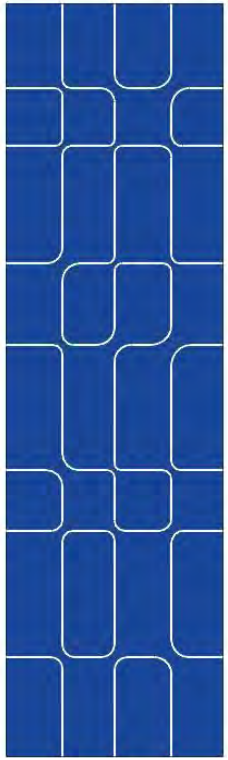




GRASSHOPPER | THE CURVES

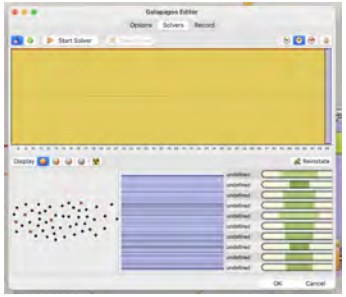
Finally, the arcs and lines were connected to form several continuous curves.

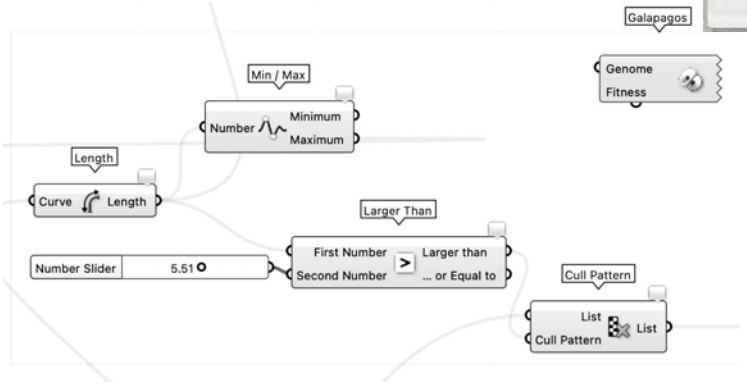


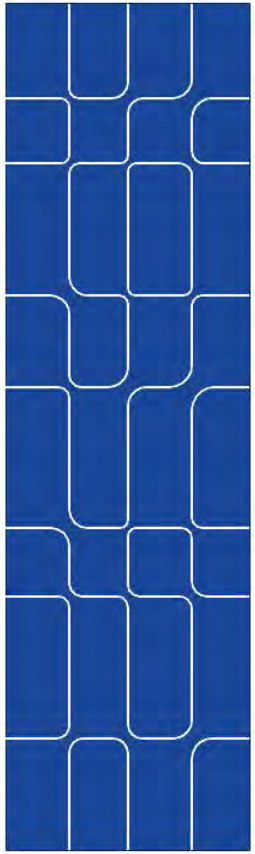


GRASSHOPPER | GALAPAGOS

Using Galapagos, we calculated the necessary parameters to create longer paths. By employing the jitter command, we were able to generate variations of different paths.

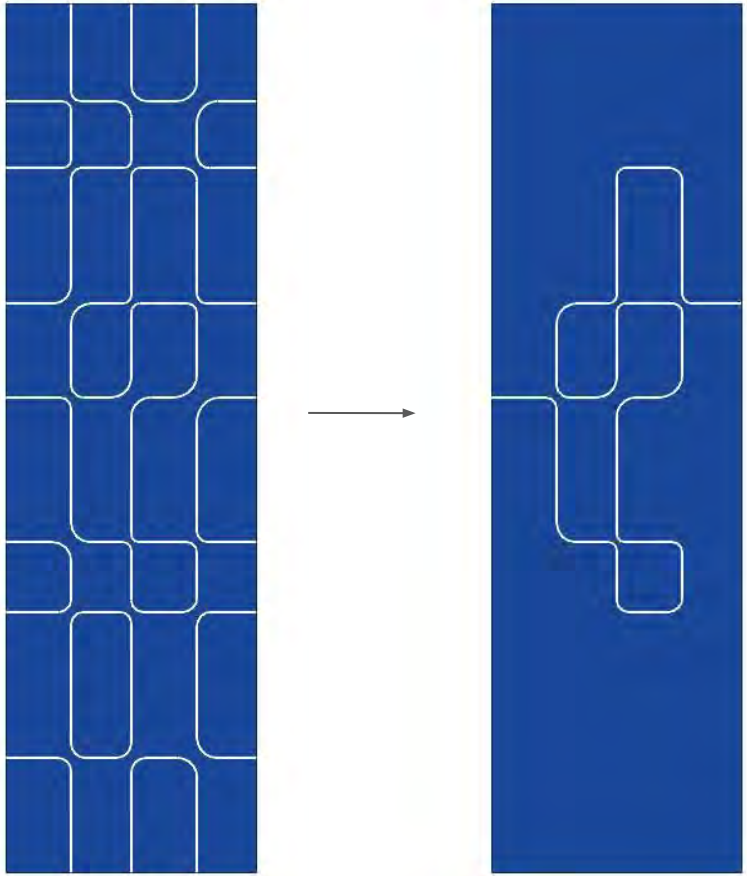






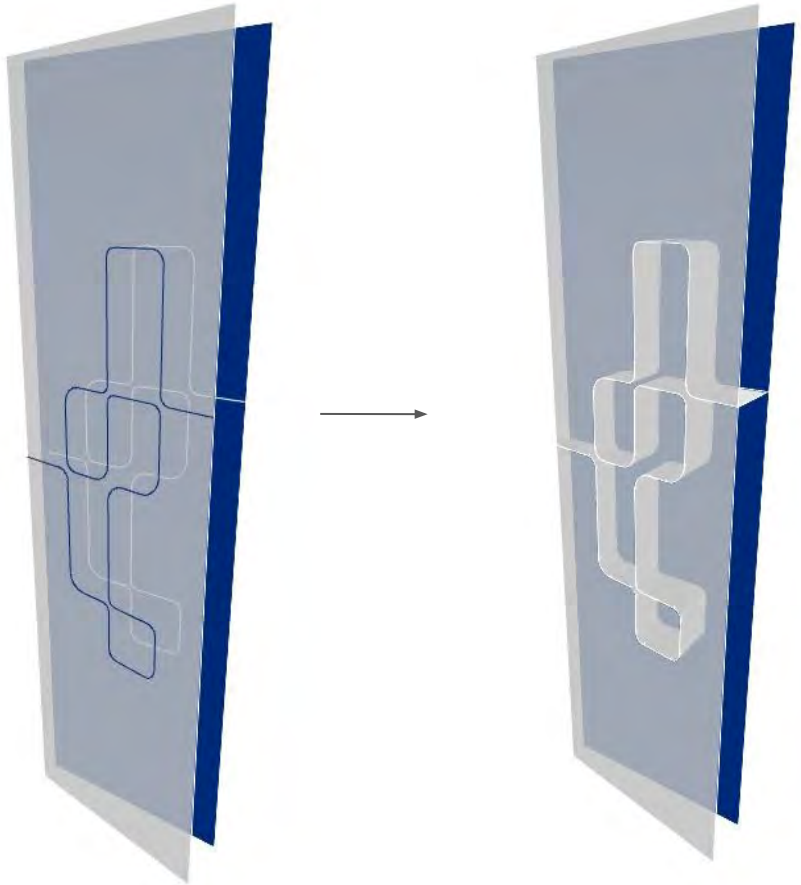
GRASSHOPPER | FINAL SHAPE

After a team discussion, we decided to go for a more minimal approach and use a single curve as the final shape for creating the 3D model.



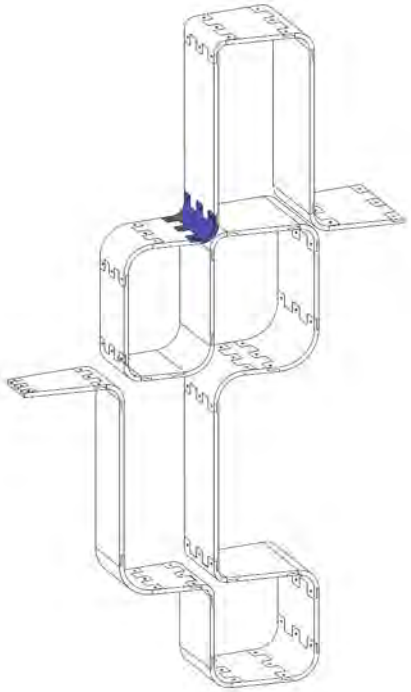
GRASSHOPPER | PROJECTING THE CURVE

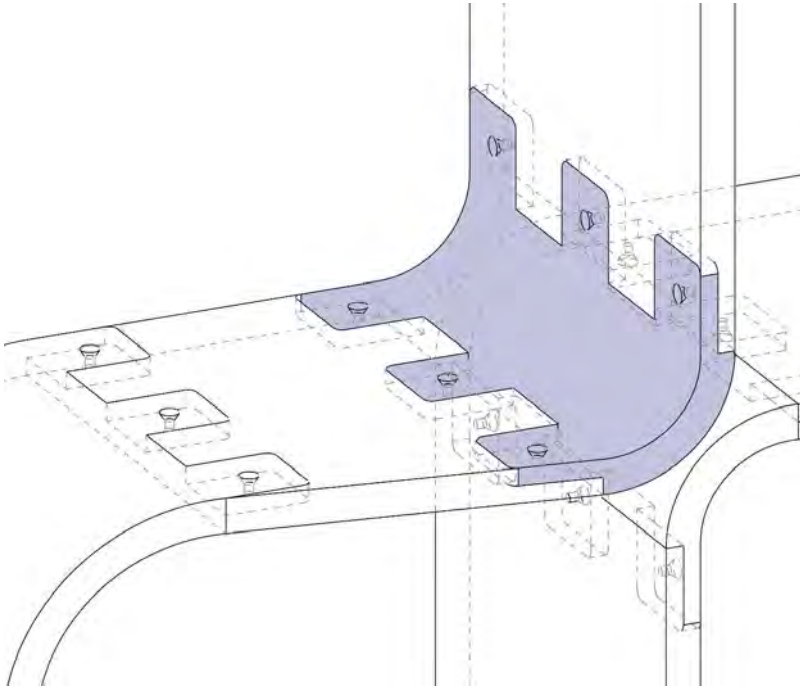
The curve was projected onto a
second surface and then extruded.

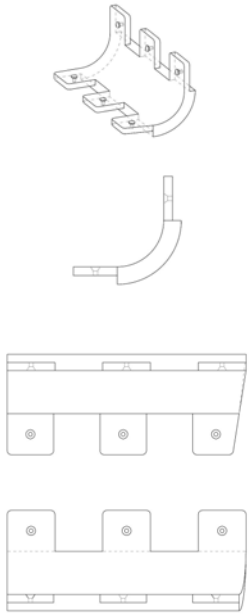


GRASSHOPPER | 3D MODEL

From the final curve, we extruded the rounded joints and flat panels. By designing finger joints, we created an interlocking mechanism that securely connects the wooden and 3D-printed parts.The corners of the teeth were rounded to account for the diameter of the mill. Holes with chamfered edges were made so the screws would be countersunk.

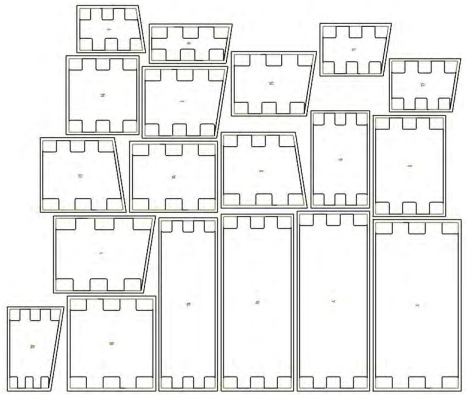


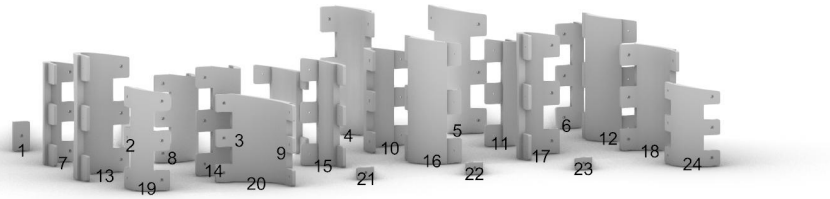


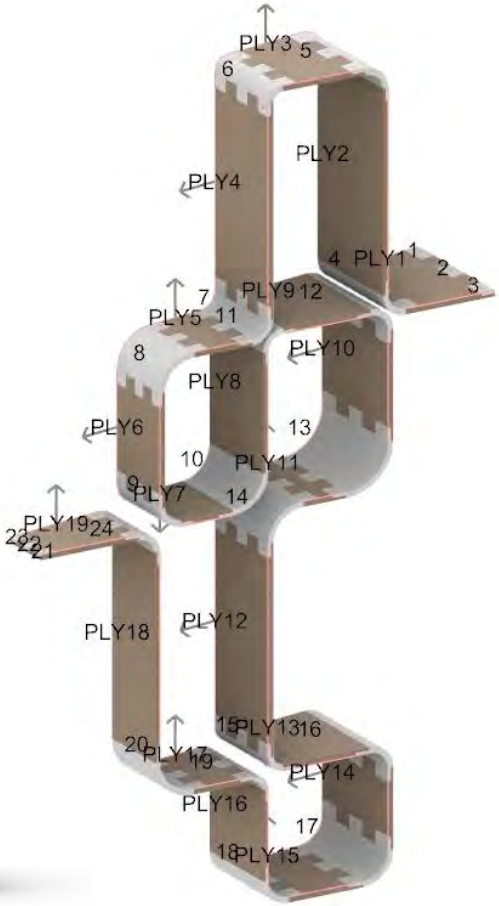


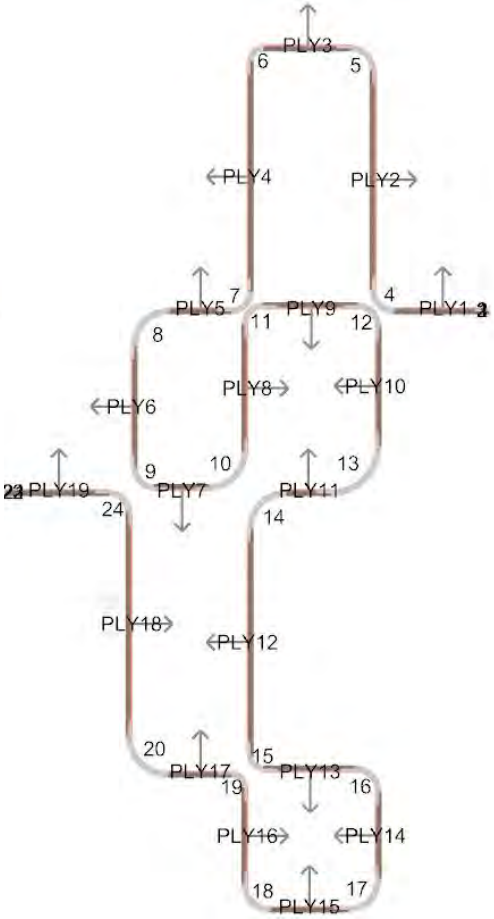
PRE-PRODUCTION

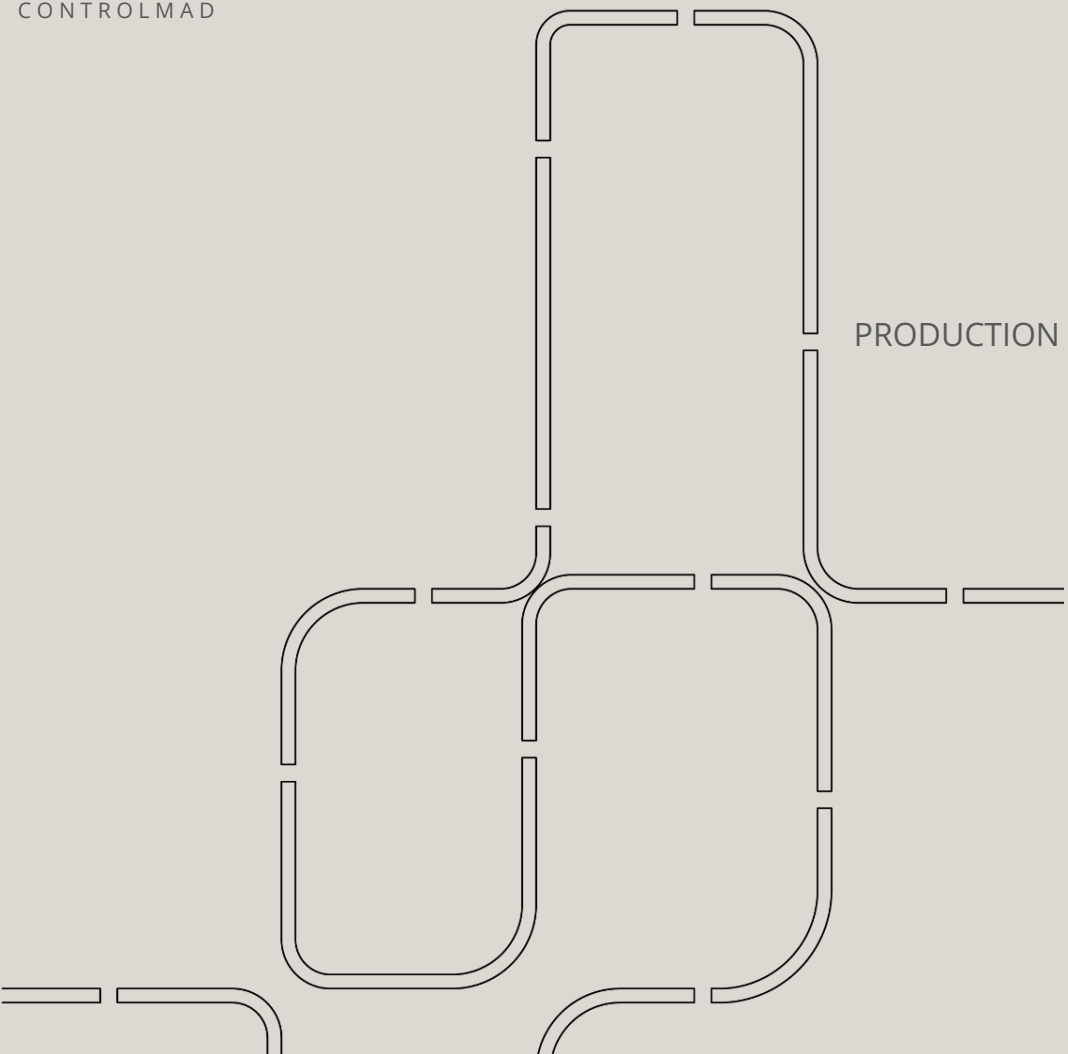
The whole model was digitally processed to be prepared for manufacturing. Parts for printing and milling were separated, nested and numbered in Grasshopper.





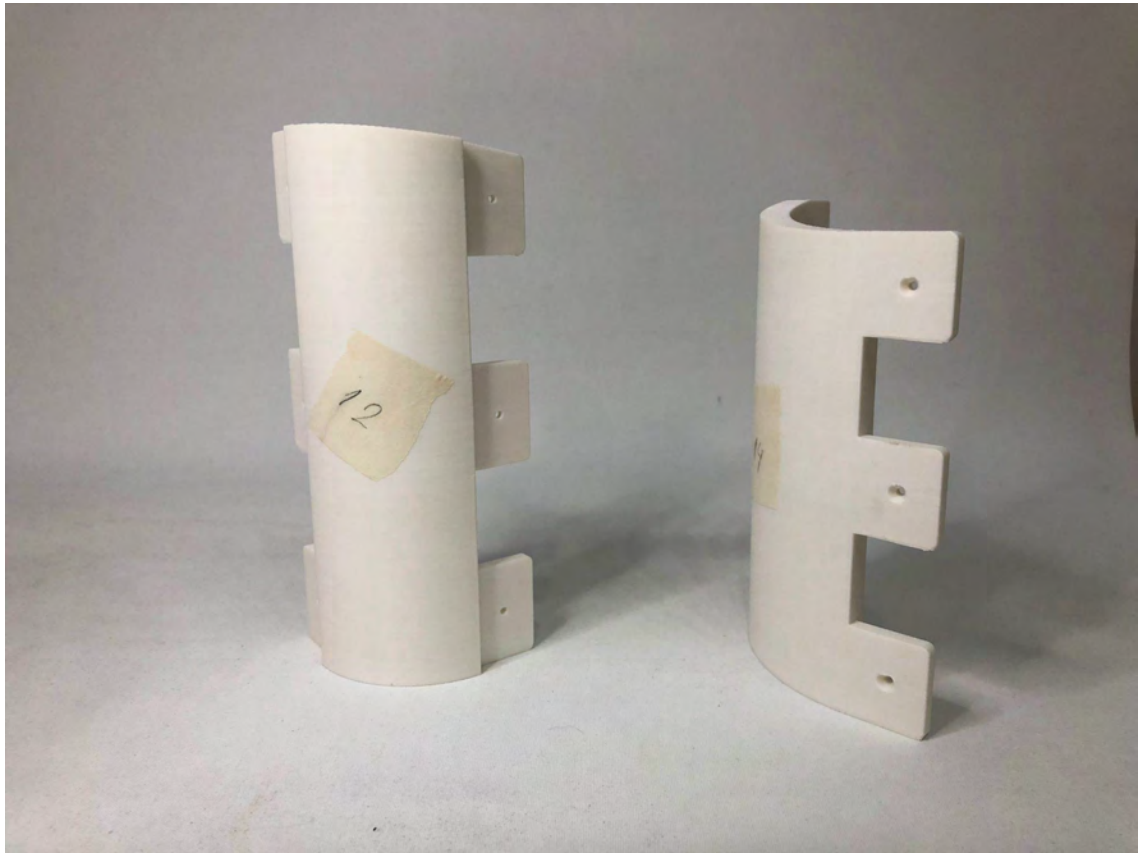




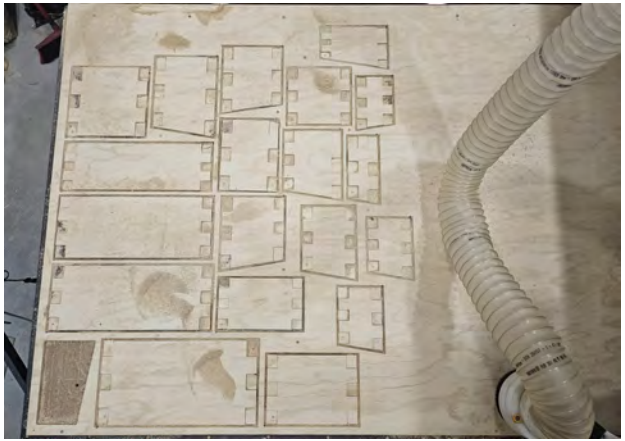


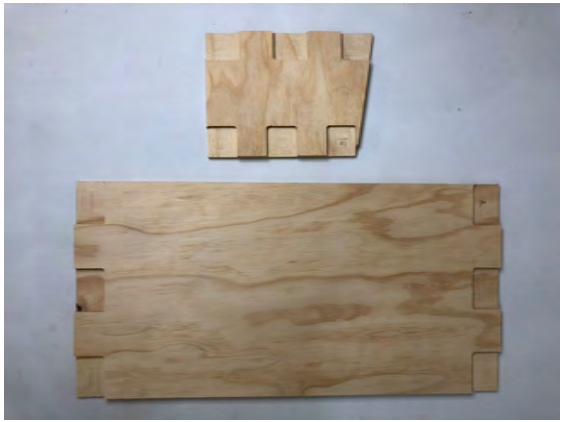
PRODUCTION

PRODUCTION | 3D PRINTING

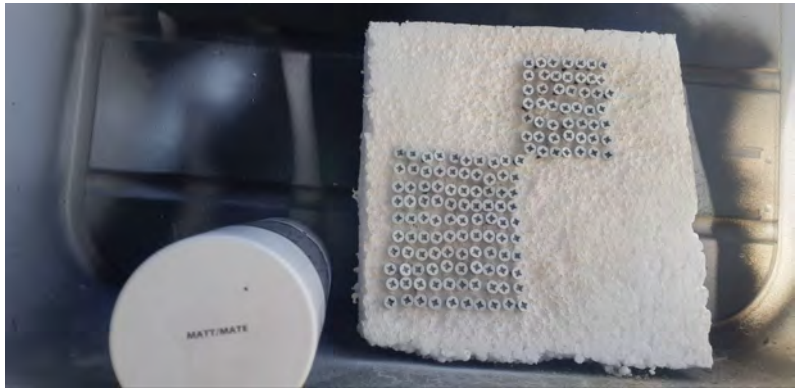


PRODUCTION | MILLING

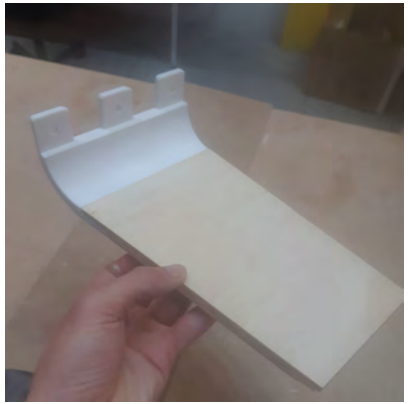




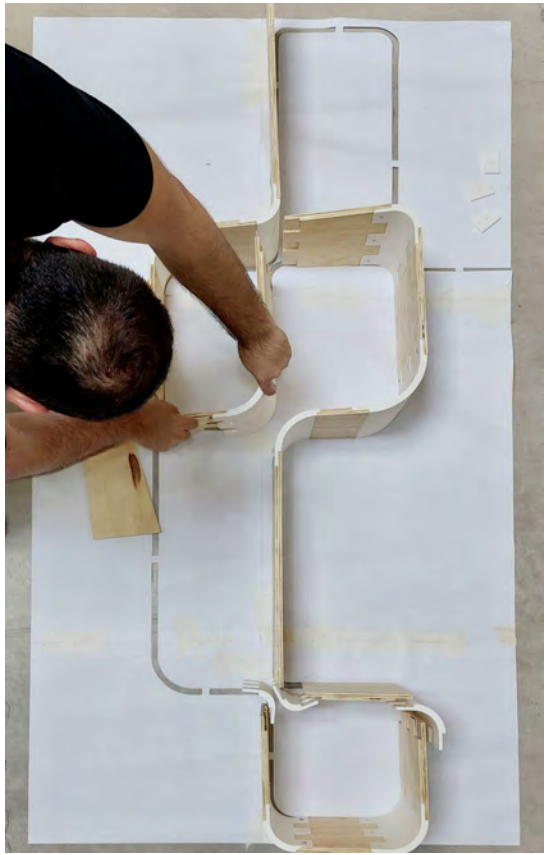
PRODUCTION | FINISHING



PRODUCTION | TEST FIT



ASSEMBLY



FINAL RESULT

THANK YOU