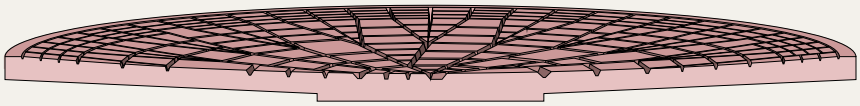
DATA

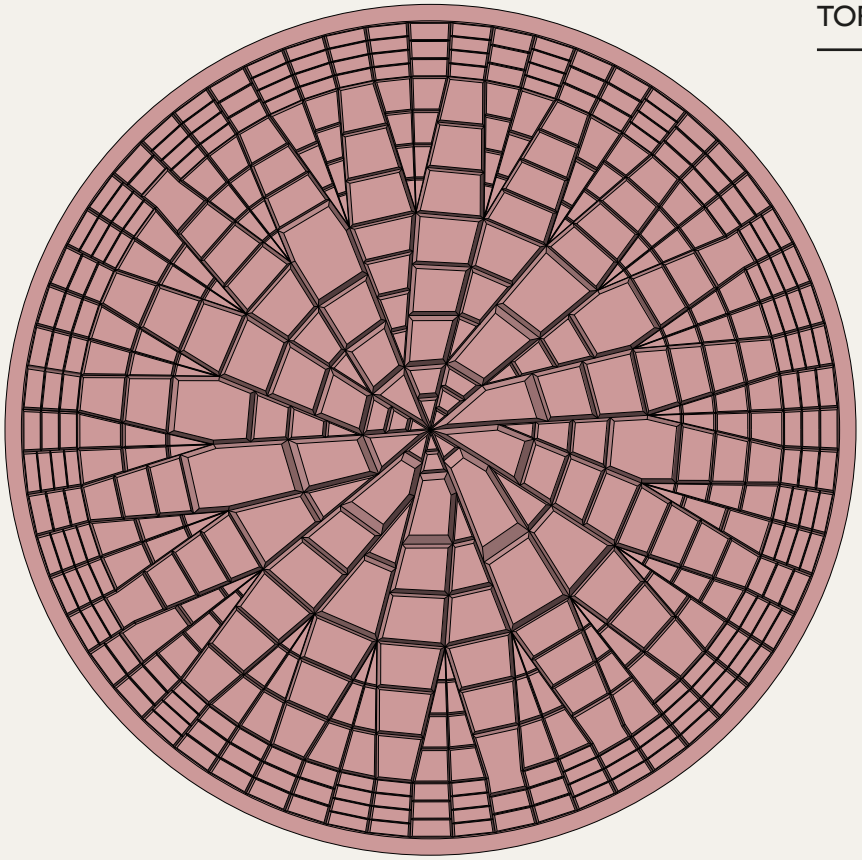
LOTUS

Jasmin Monschein

SECTION
A-A



TOP VIEW



A-A

plate

DESIGN CONCEPT

The pattern shaping this plate is based on the way water is t r a n s - ported across the swimming leaves of the Lotus plant.

These leaves have a very distinctive variation of veins that can be associated with the structural geometry of data trees.

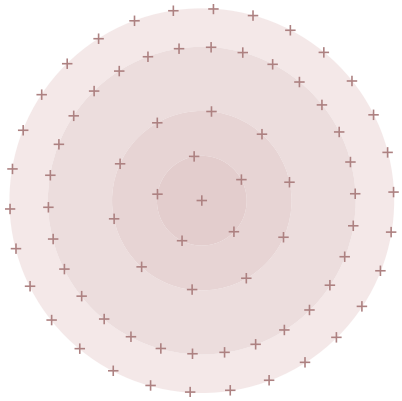
Thus, the idea was born to play with the flexibility of how these diagrams can be depicted. Using parametric designing methods such as grasshopper a variable frame is generated that allows countless possible variations.
Due to this fact, there are an endless number of configurations to be explored.

The work consists of a play with shapes, depth and density. Therefore, appearances range from very organic forms to very methodical shape language.

digital fabrication

1

2



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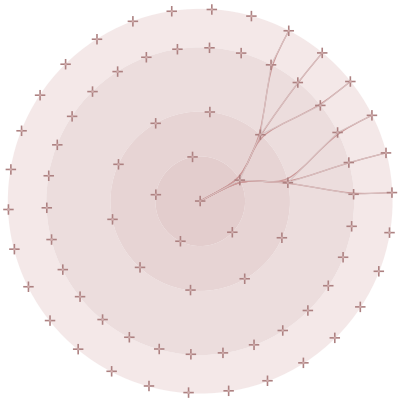

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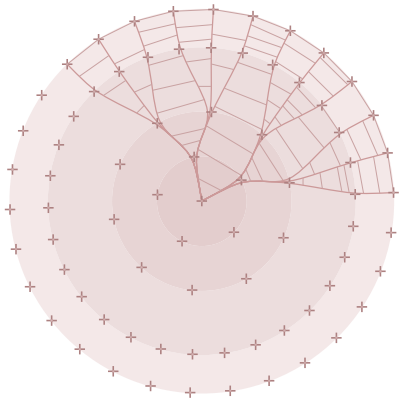

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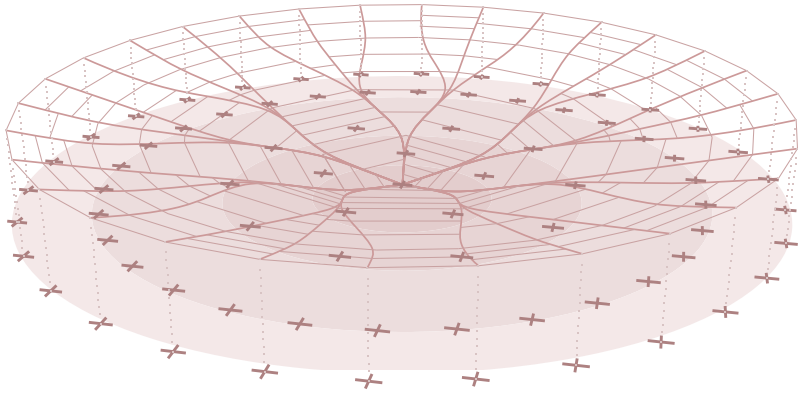


1 The shape is based off of 4 offset circles, sorted from smallest to largest.

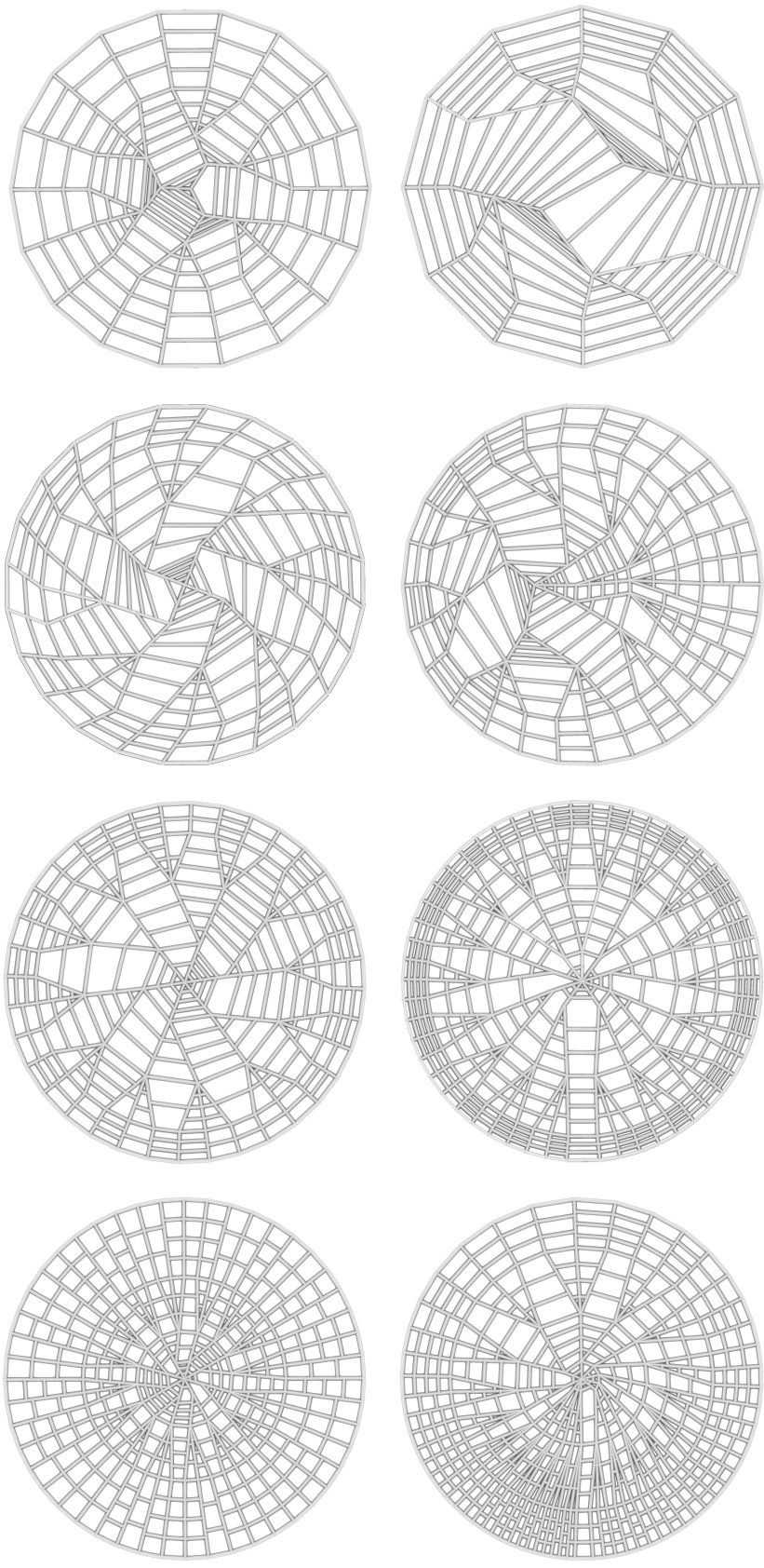
2 Step one is to divide the first, and smallest, of the circles into a defined number of points. Then, the second, larger circle is treated the same way with double the amount of points. the same process is utilized for the third. Lastly the outermost circle is divided by the same count as the previous one.

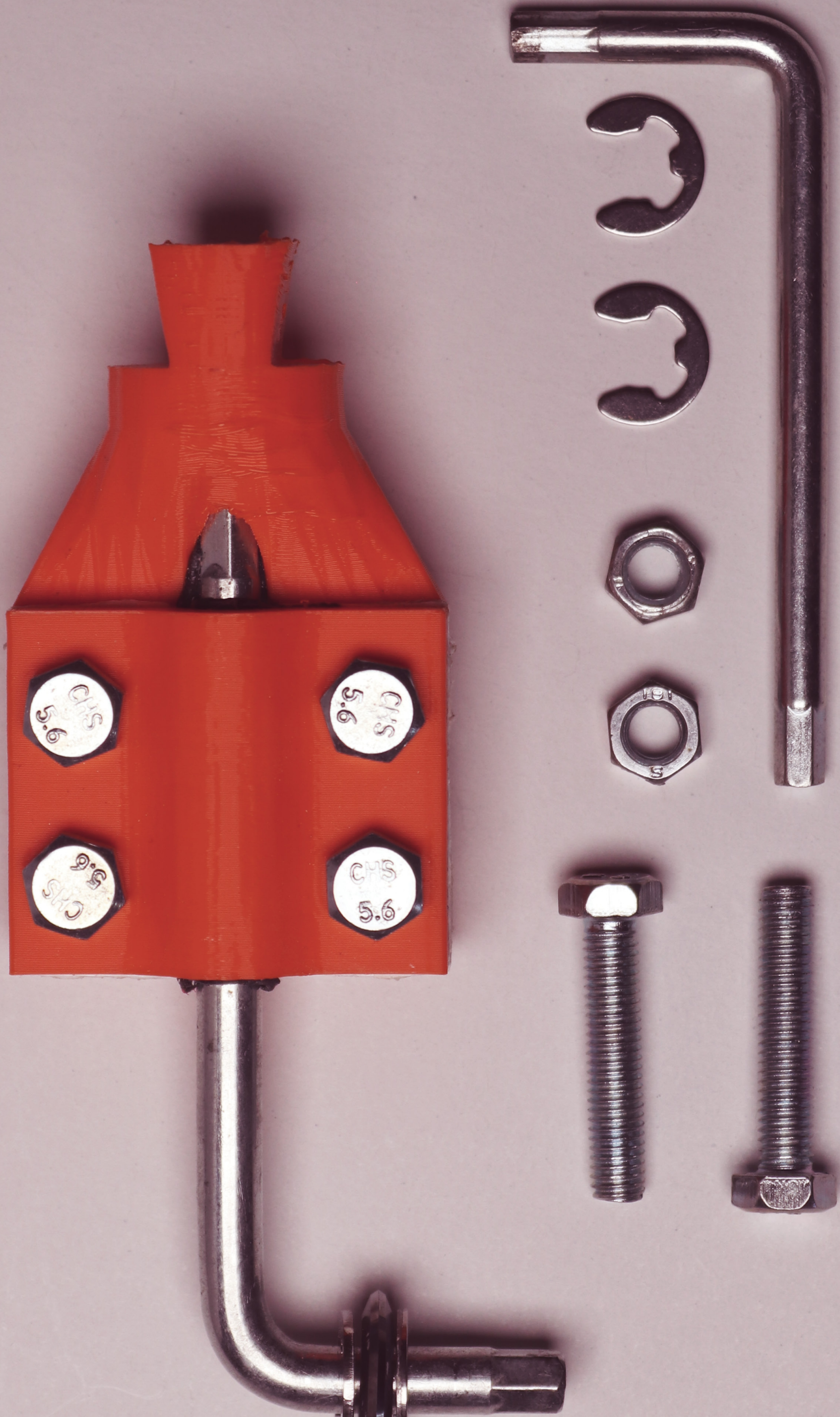
3 Branches can then be defined by connecting the centre point to one of the points of each layer of the diagram. The count of circles determines how often each point is used to make a branch. In this example the 3 inner circles are formative for the branching of the shape. The 4th one is irrelevant since it contains the same amount of points as the 3rd and therefore doesn't cause another branch out. Therefor the first set of points is used 3 times, the second 2 times and in the third and fourth set each point is part of one single branch.

4 Emulating the intertwining nature of leaf veins connections between each branch are formed. Here a random number of connectors extend in the spaces between branches at a 90° angle to the centre point.

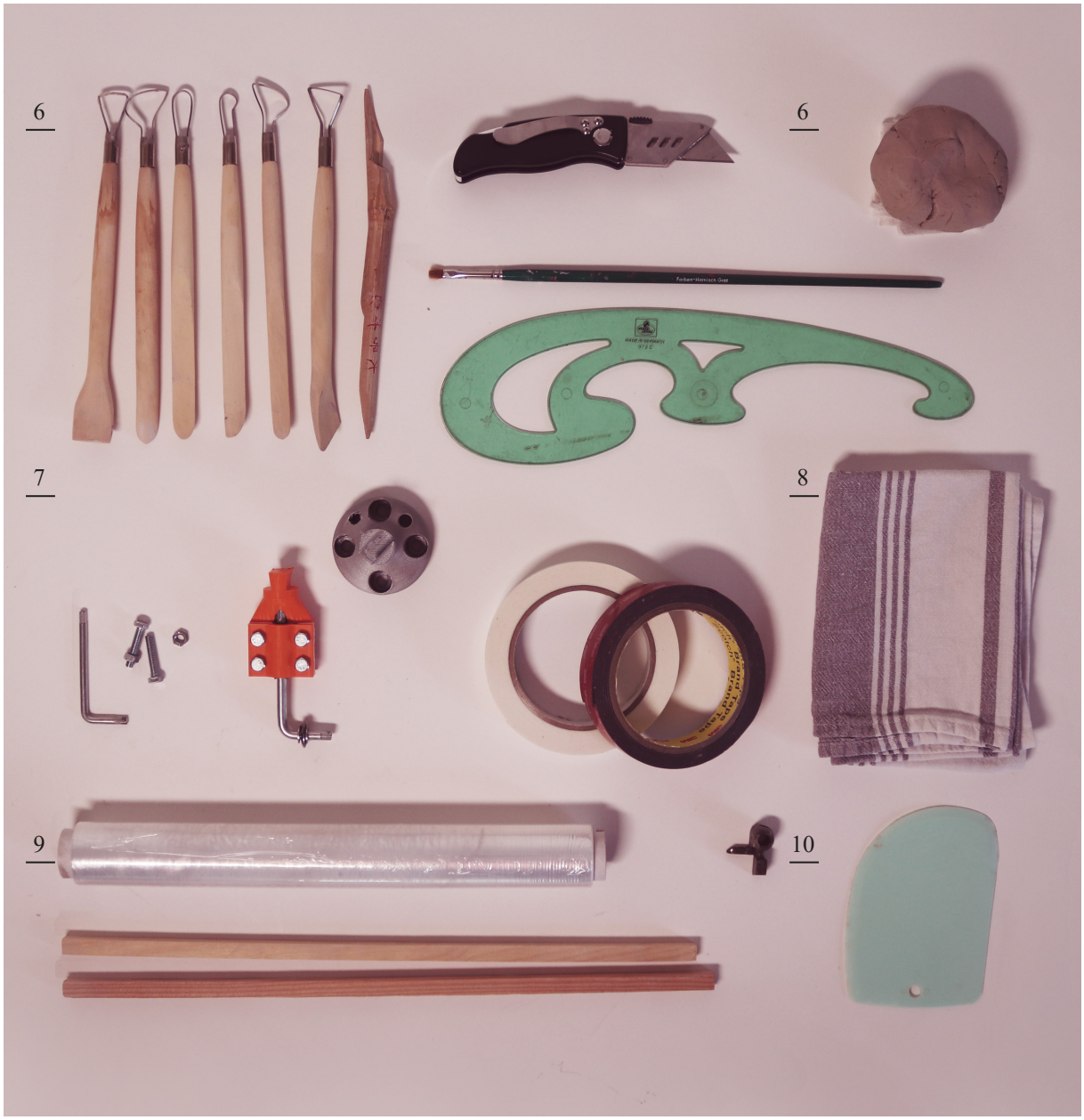
5 In the step, the design tapers downwards toward the centrepoint in order to create a progression in depth.

parametrical design




CHS
5.6
CHS
5.6

materials and tools



6 Clay working tools

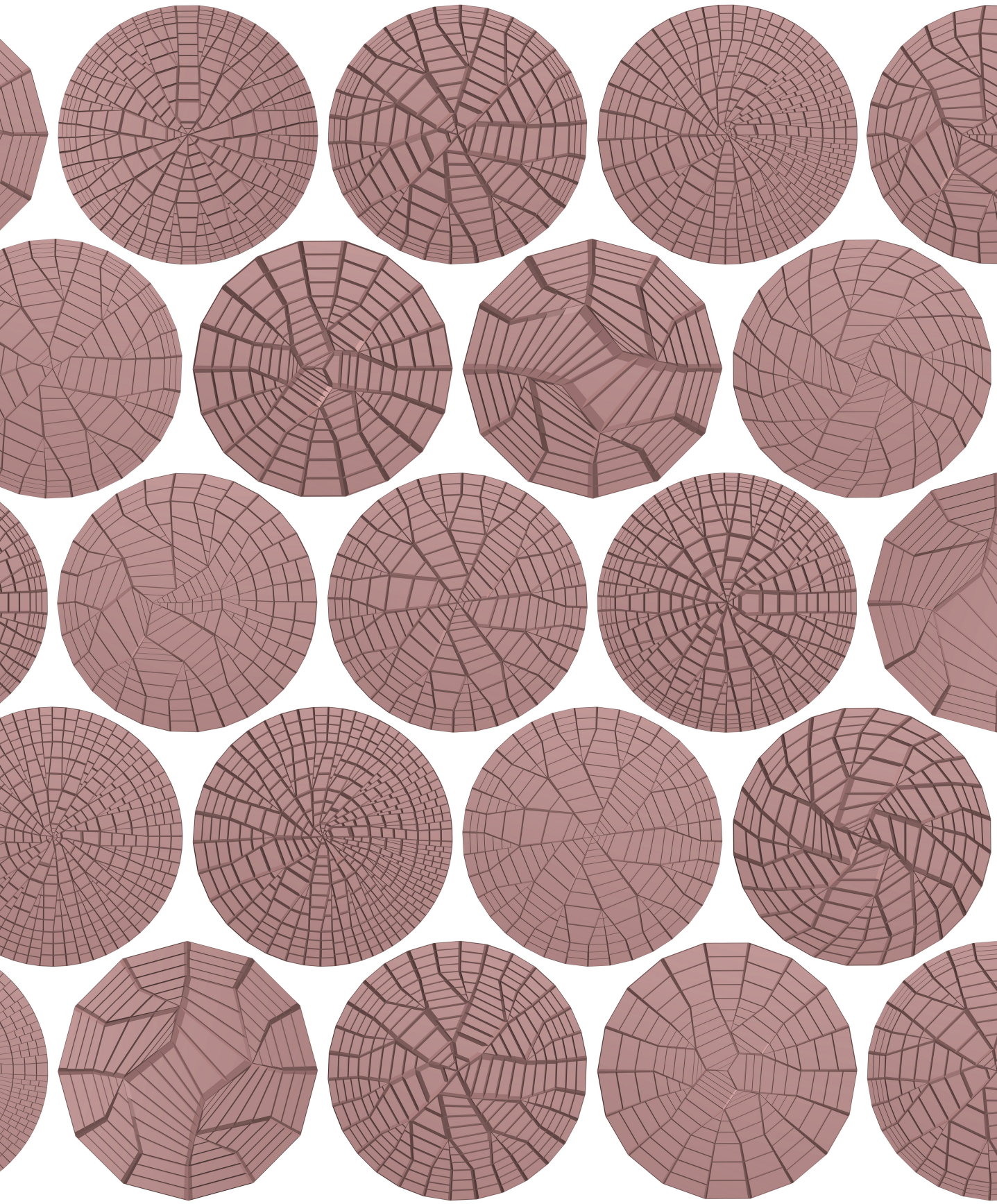
7 a Cutter knife to slice away,
a Brush to smoothen out small crevices,
a French Curve to act as a guide

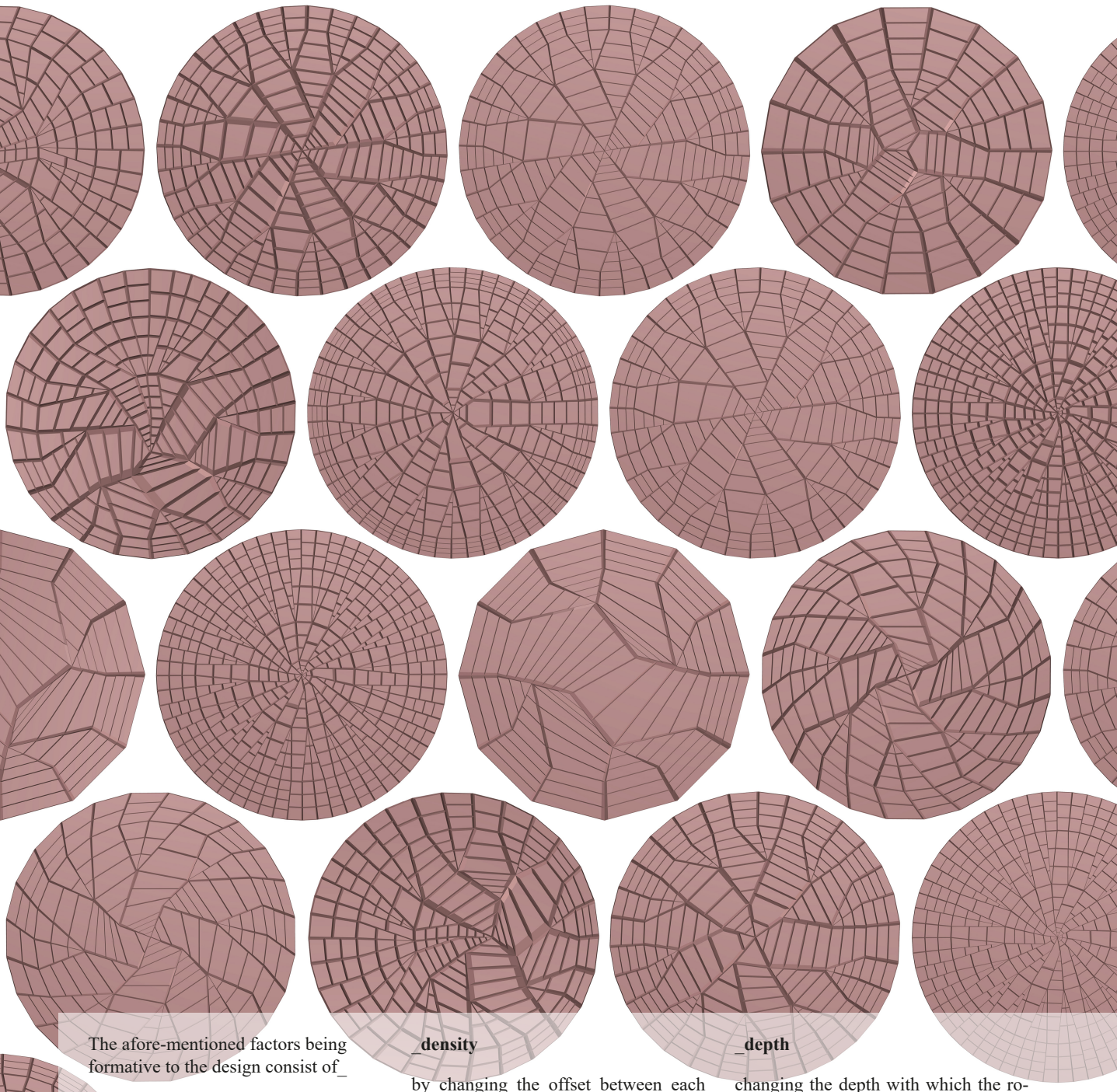
8 a Robot extension being made up of metal tools,
Tape providing cushioning and
3D printed connection pieces

9 a Towel

10 utensils to get the clay into a uniform slab.

11 a Scraper to smoothen out the surface of the clay.





The afore-mentioned factors being formative to the design consist of_

_branch count

the most defining feature is the amout of branches carving the plate. Here the inner-most branch count determines the overall amount of branches.

_density

by changing the offset between each layer of points the density can be shifted between the center and border of the plate.

_center

movind the innermost point away from the center consequently shifts the whole design.

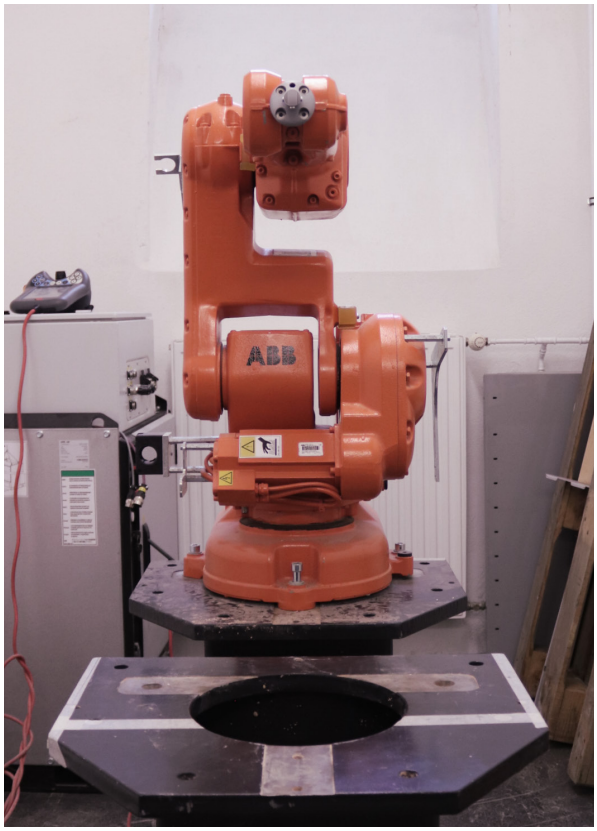
_depth

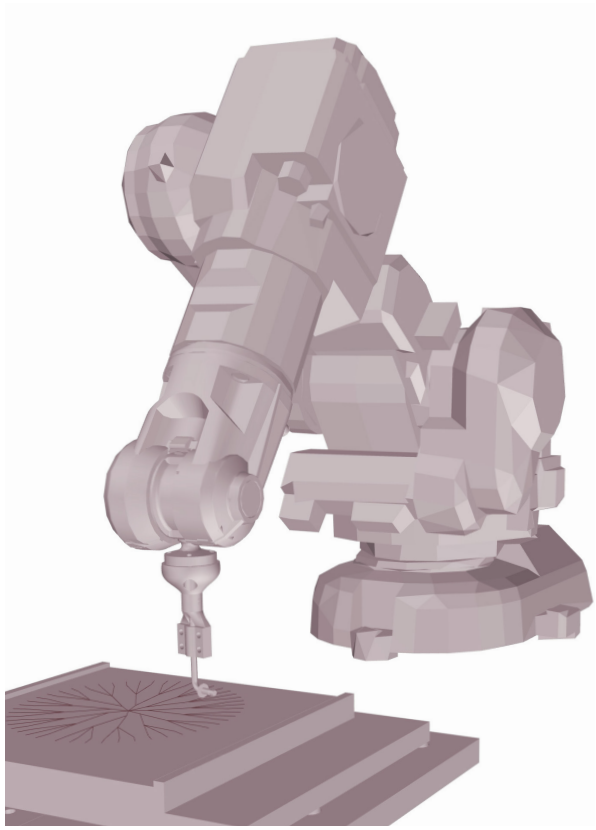
changing the depth with which the robot permeates the clay affects the extent of shadows inside the grooves.

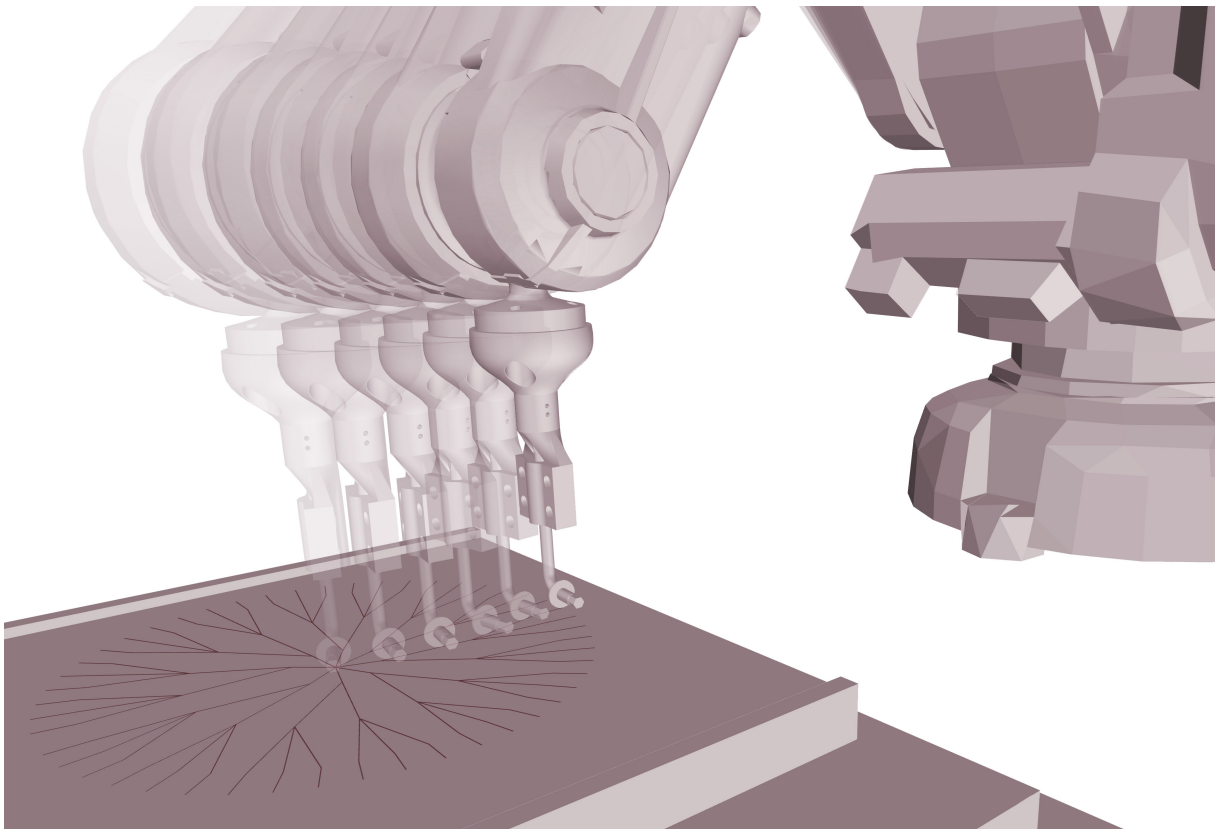
_uniformity

the symmetrical nature can purpusfully be neglected in order to arrange the branches using mathematical functions.

6 axis ABB robot arm







DIGITAL DISHES 4.0

COMPUTATIONAL CRAFTED NEXT GENERATION CERAMICS

Digital fabrication processes and digitally controlled machines have a growing influence on building industries and thus also on the creative possibilities of architects in design. The principles of mass customization mean that the batch size of one, i.e. the unique specimen, which was common in pre-industrial construction, can once again be produced economically. In this advanced module, the theory and methods of parametric and generative design methods are studied in depth and their linkage with current rapid prototyping methods is tested.

The students worked on a project to design tableware. They used traditional and cutting edge manufacturing techniqes and incorporate them into creative process of designing new tools. Using an ABB robotic arm, students transformed own dishes into bespoken artwork.

COUSE LEADERS:
Urs Hirschberg
Lukas Gosch
Milena Stavric

STUD. ASS.
Felix Dokonal
Kilian Hoffmann

ADVANCED MASTER COURSE SS 2023
161.792 SE Generative methods and digital fabrication 1
161.793 SE Generative methods and digital fabrication 2
161.794 UE Design project generative methods and digital fabrication

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