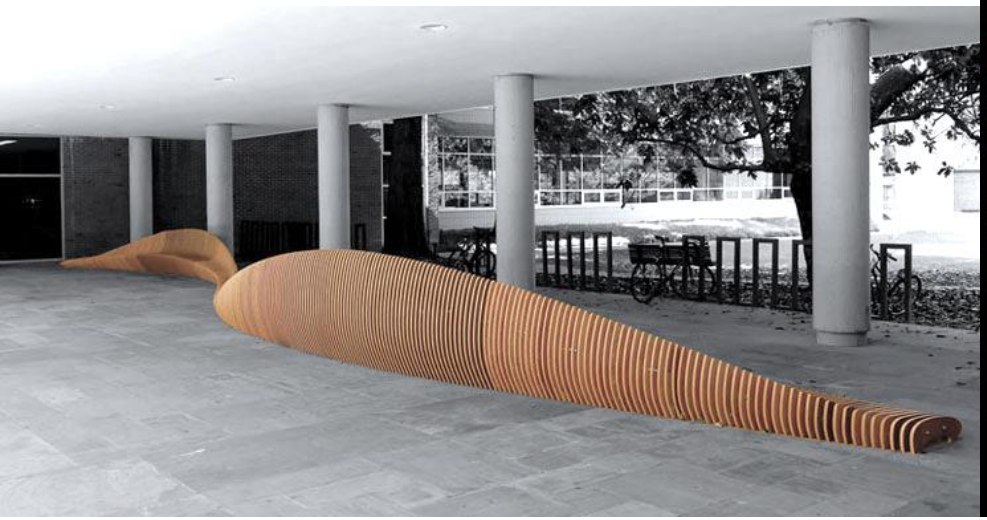

BLOSSOM
by Clark HOU



For centennial celebration of School of Architecture in 2009

Removed recently, So a successor is needed.

Design a Bench at Square under Arch East

Site Analysis

Function

- Short Passage to 4th St
- Serves as banquet venue

Requirements

- No obstruction for east-west path
- Leave area unoccupied as much as possible

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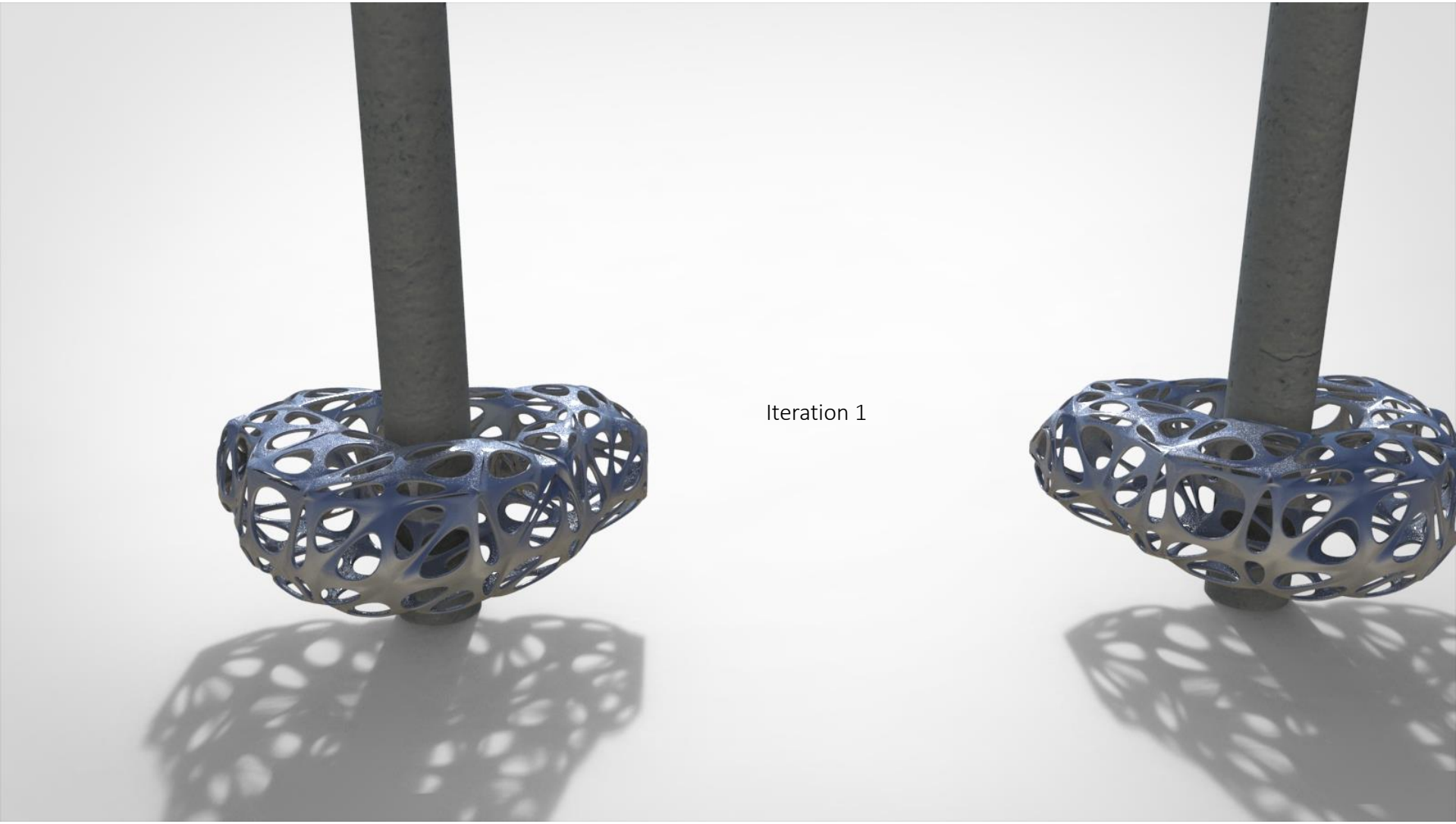
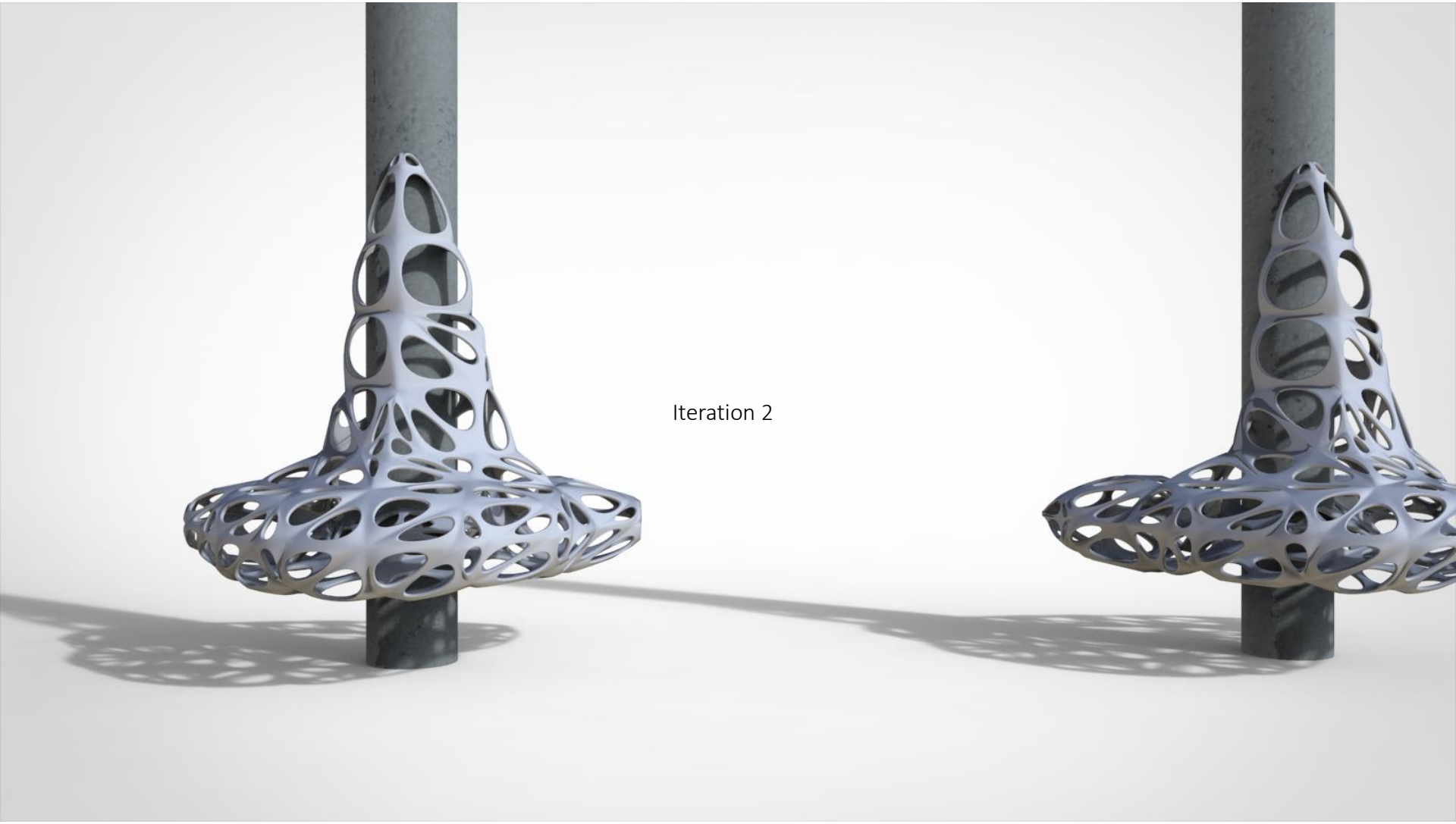
Circular Bench around the pillars

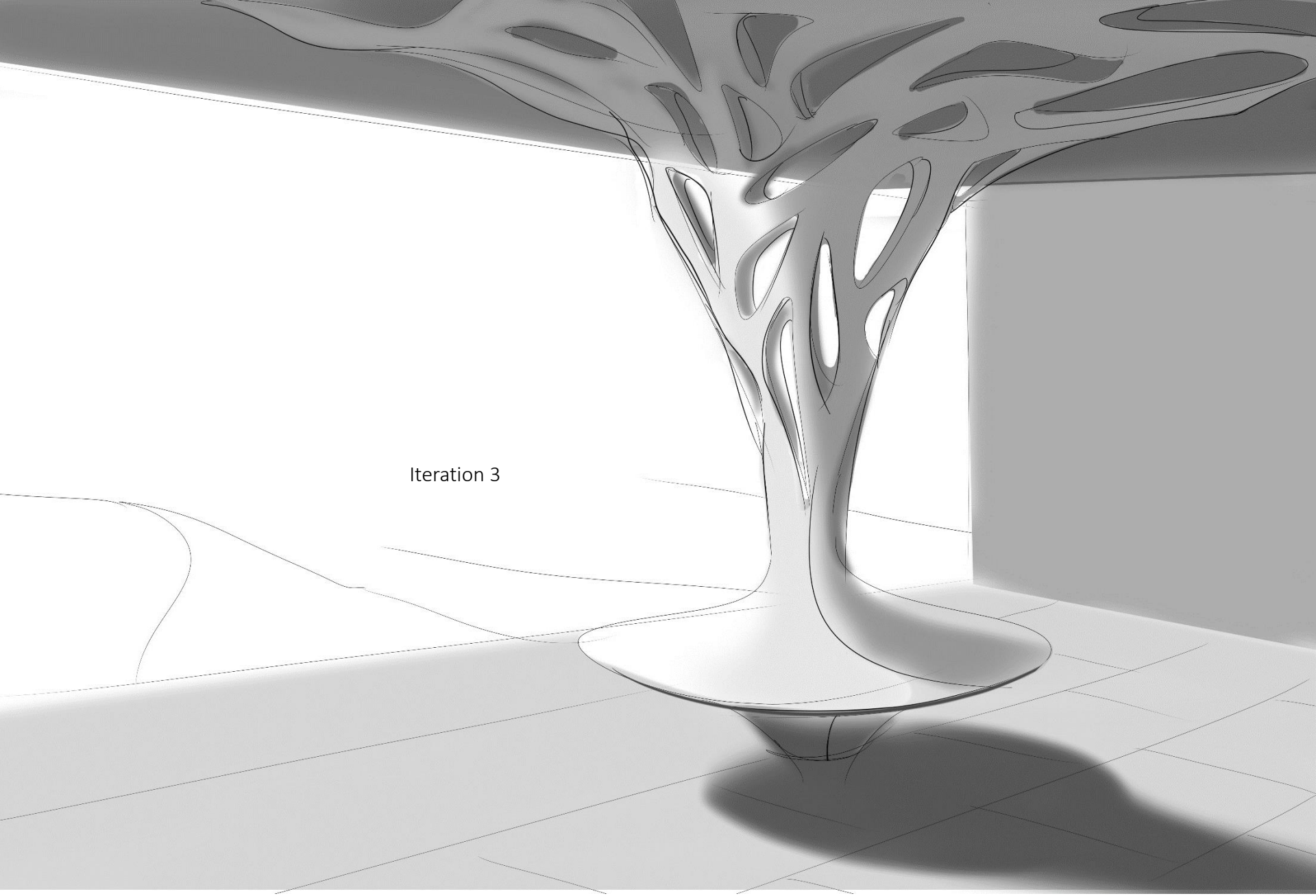
Monolith Iteration



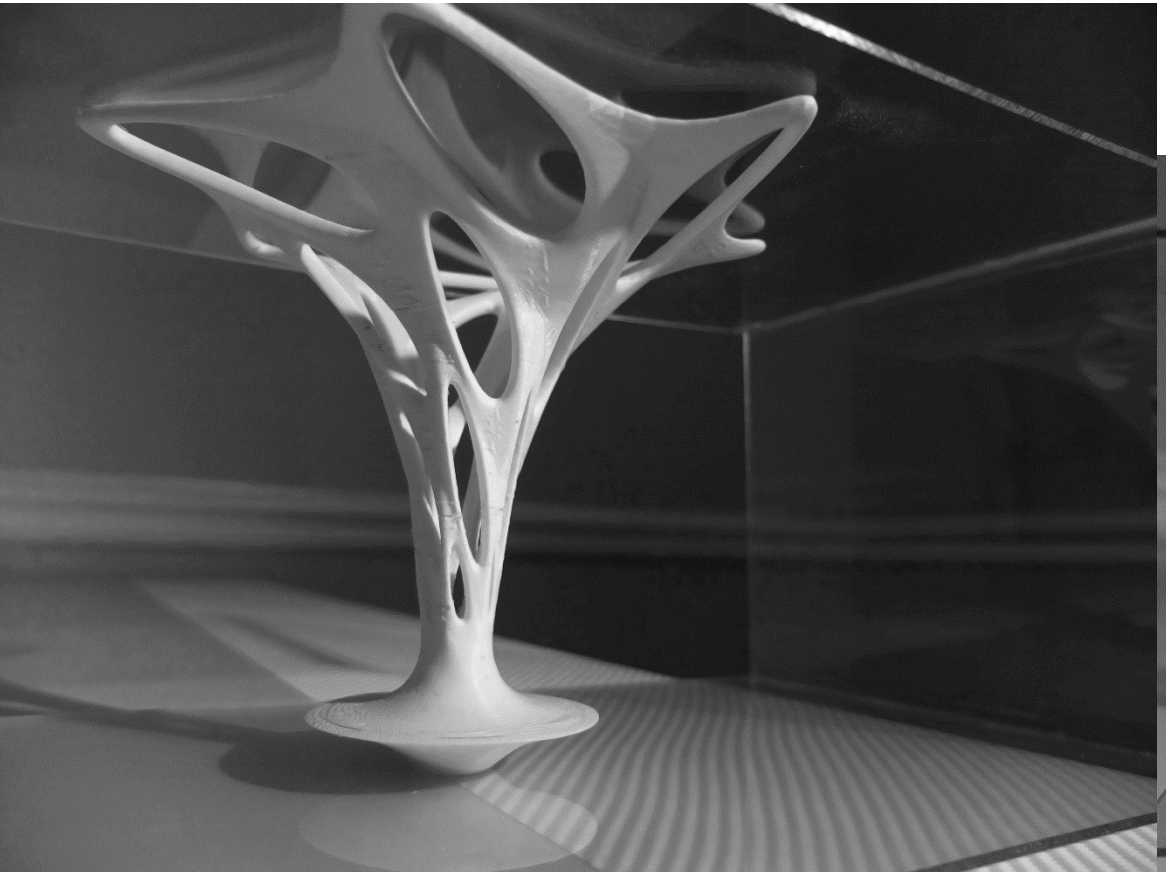
Iteration 1

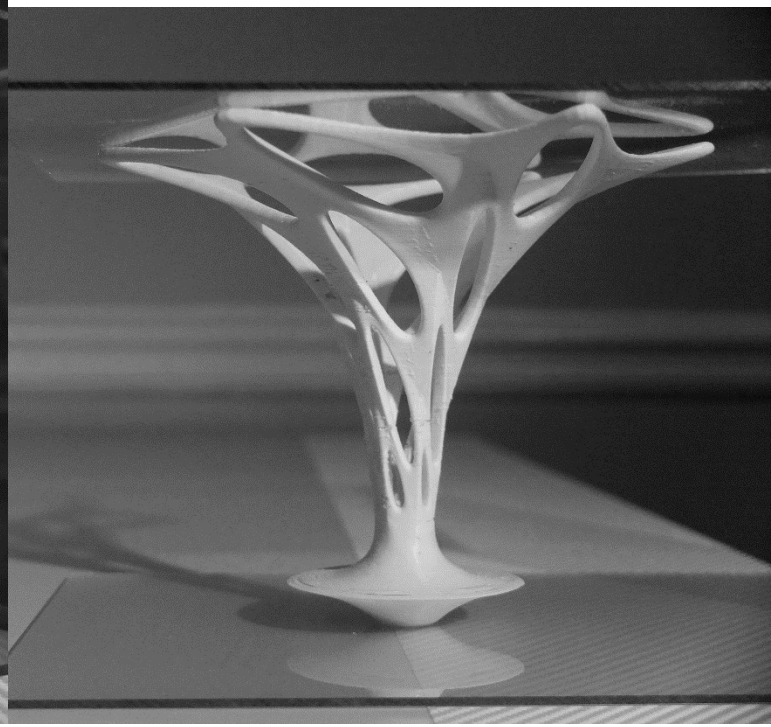
Monolith Iteration

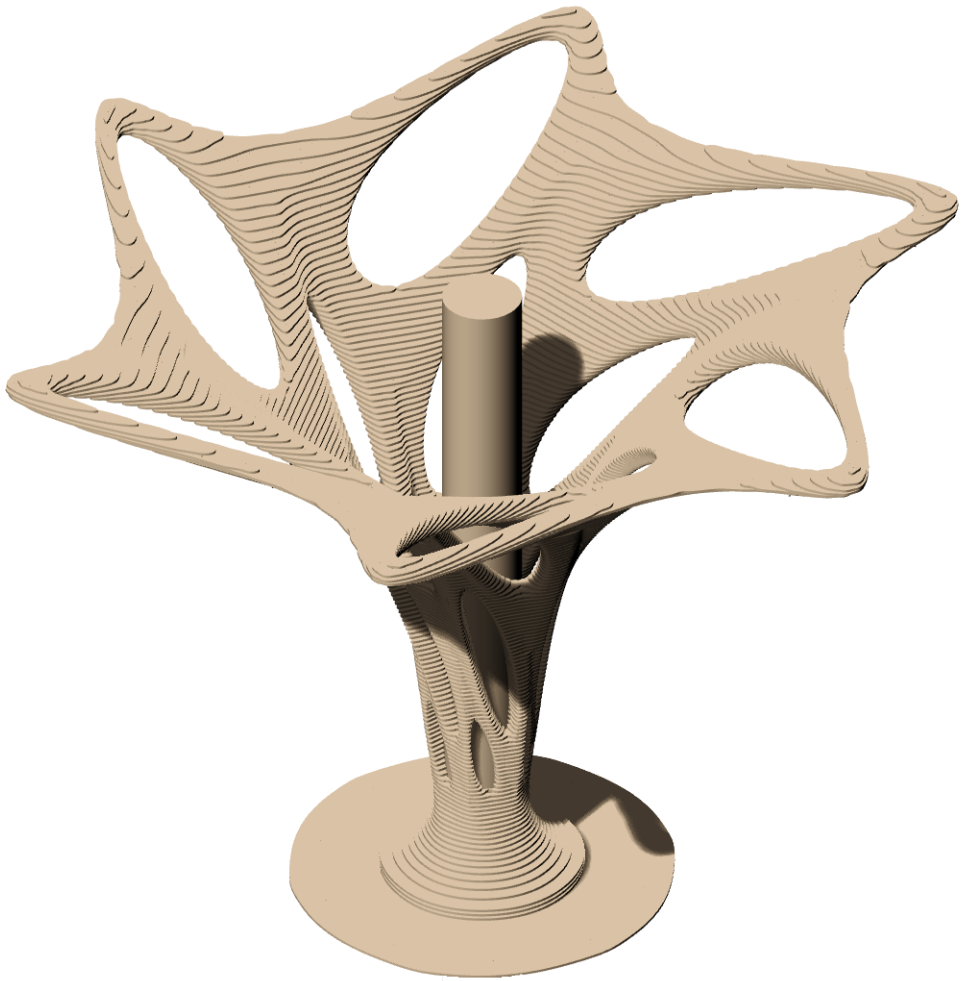



Iteration 3

3d Print model





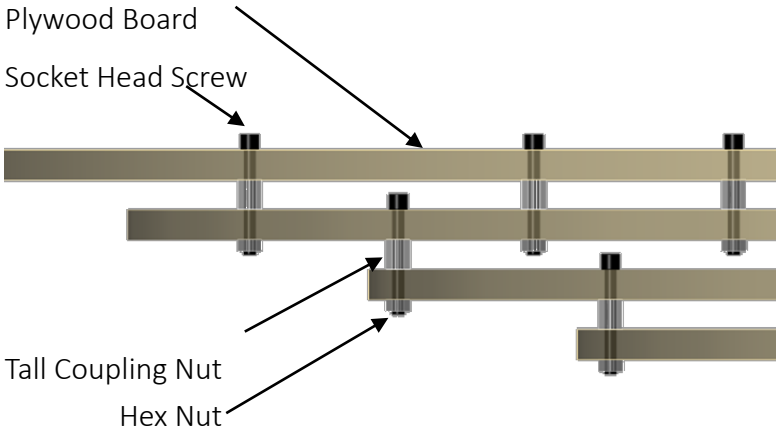


Fabrication

CNC machined Plywood boards will be stacked from the bottom to the top.

A set of Screws and nuts will bridge the board and the board below it.

Joinery

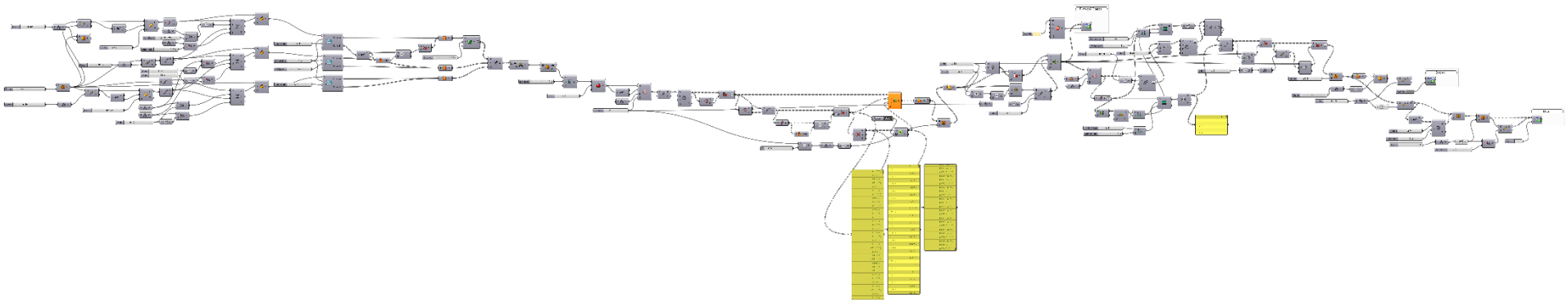


Washers as needed

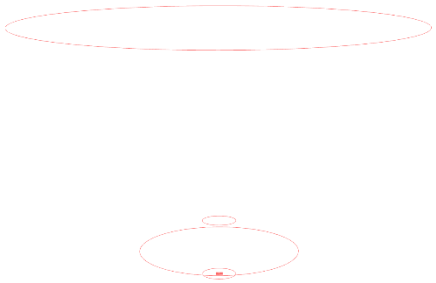
The dimensions of the parts is yet to be determined since I don't have the actual dimension of the site.

Process

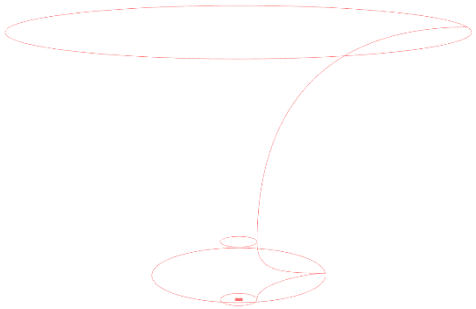
Base Surface → Corolla Skeleton → Shape Slicing → Create Joints



Base Surface

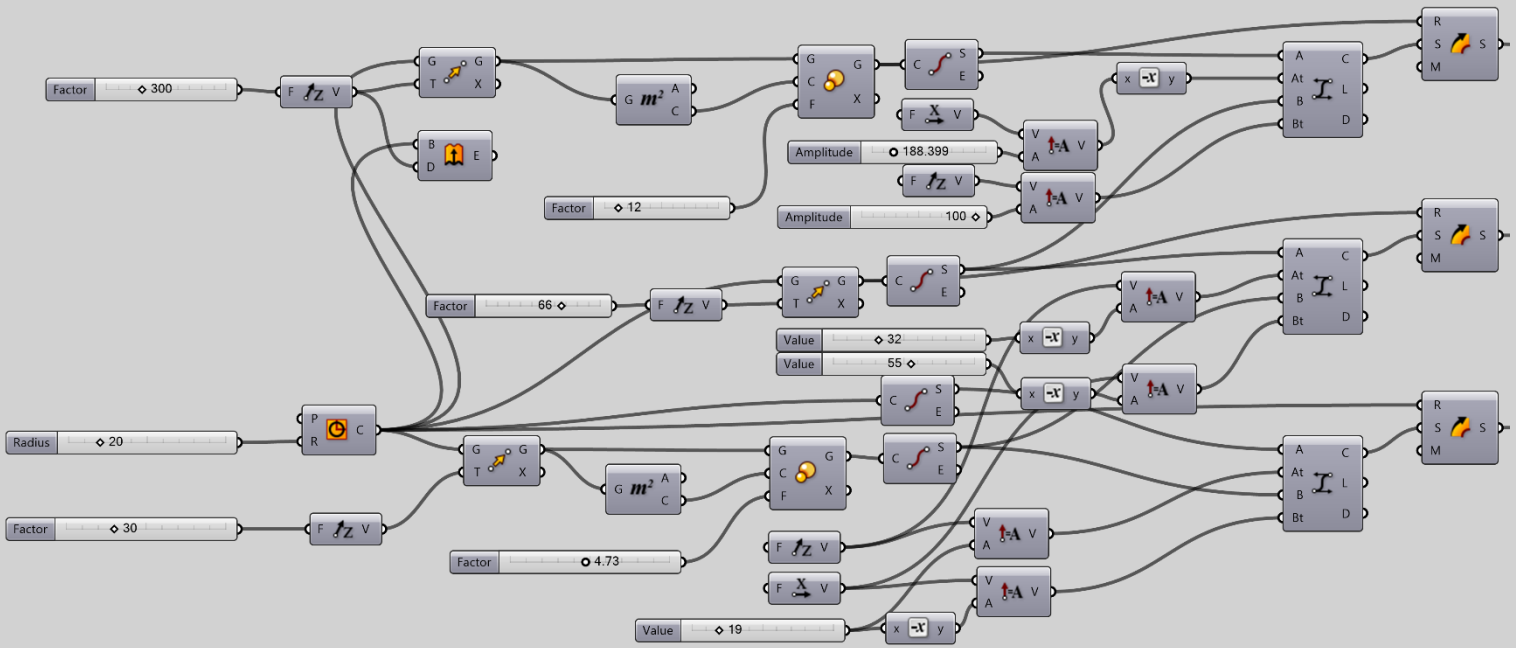


Circles

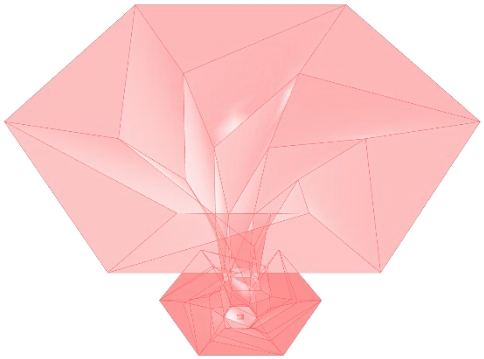


Profile Curve

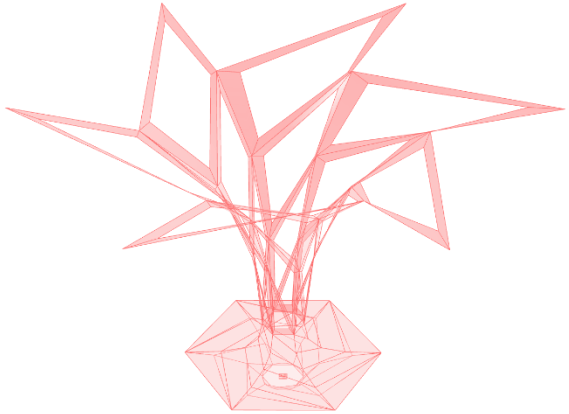
Sweep Surface



Corolla Skeleton

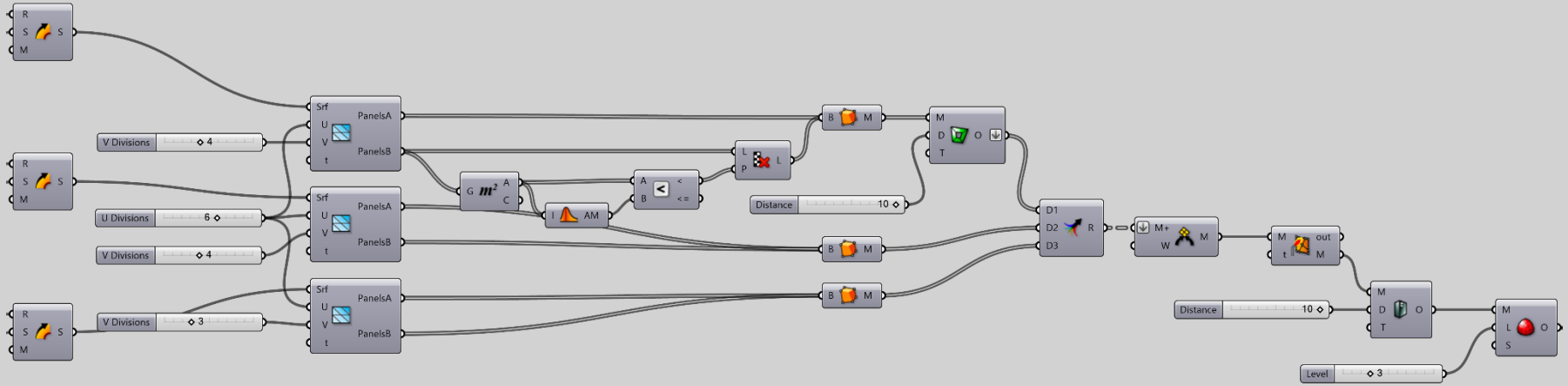


Skewed Quad Panel



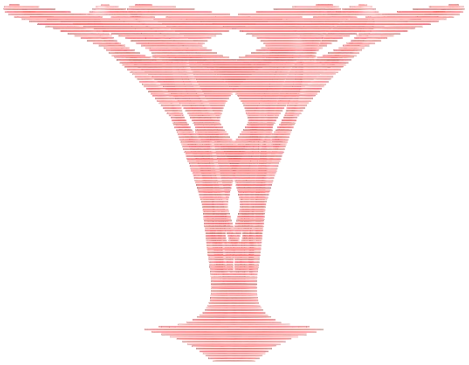
Mesh Frame

Mesh Relaxation

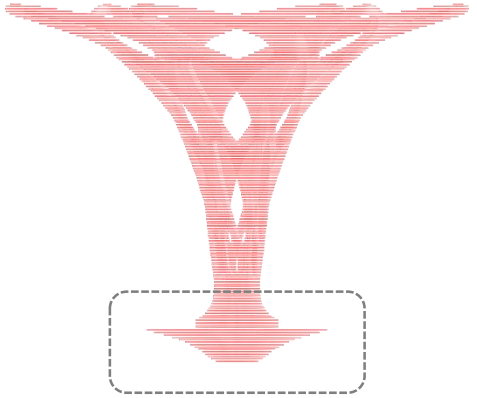


Shape Slicing

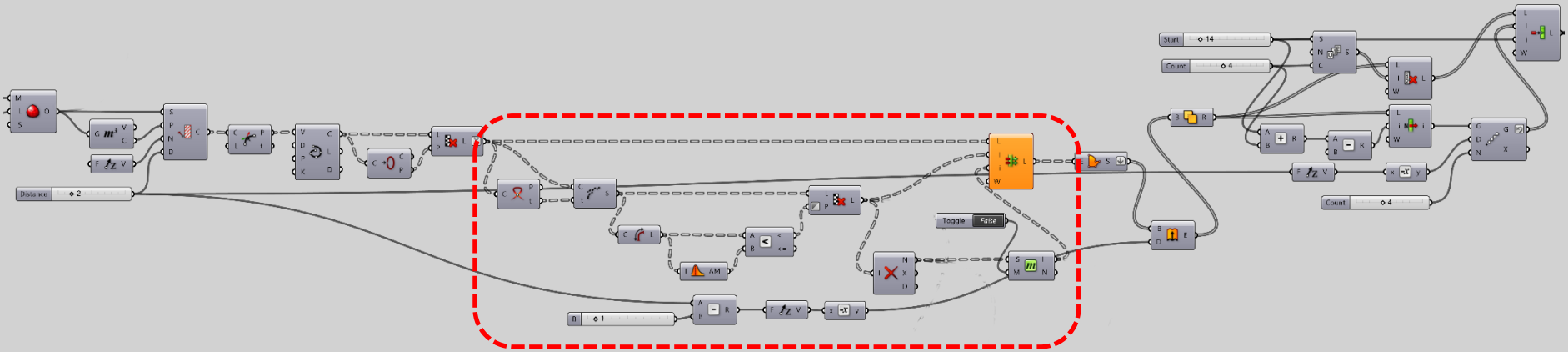
Extract mesh contours and convert to curves



Extrude Boards

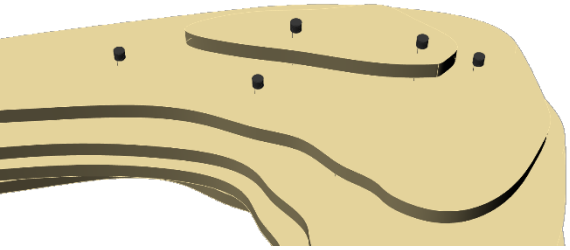


Modify for bigger Seat Area

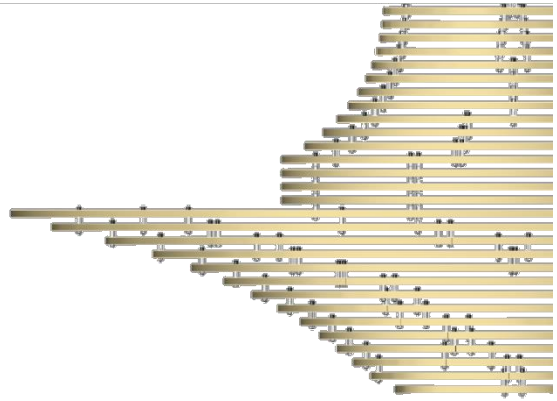


Mesh contours are chaotic, this portion fixed self intersecting curves

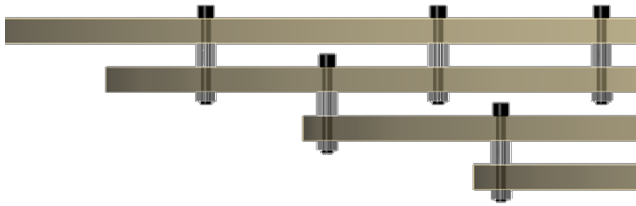
Create Joints



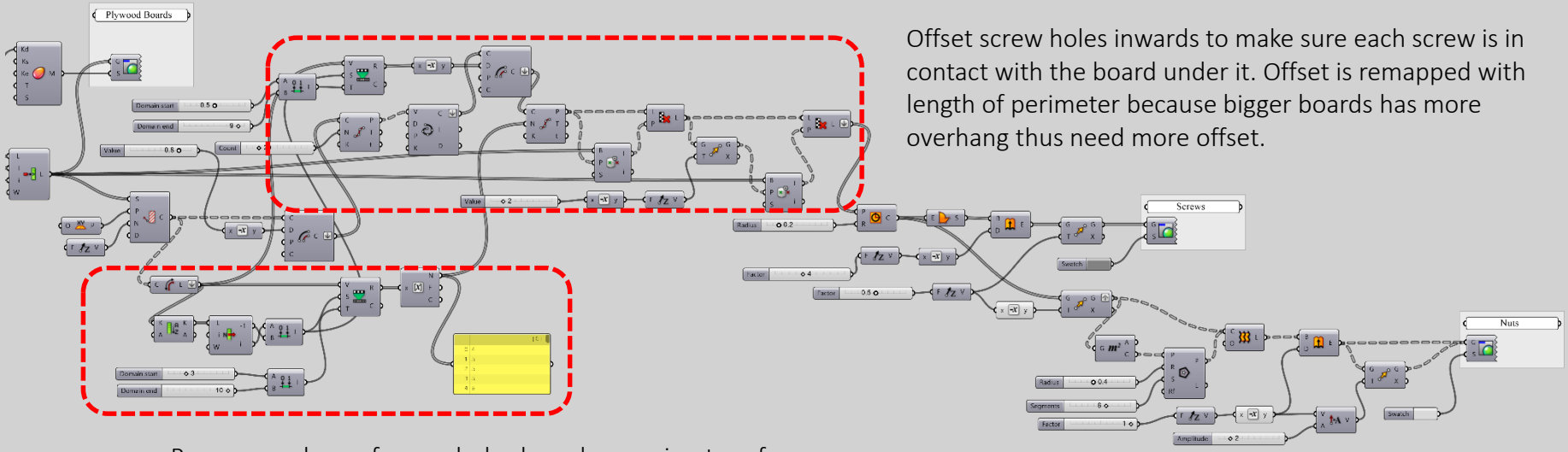
Define Screw Quantities (2-10)



Define Screw Hole Positions



Create Screws and Nuts

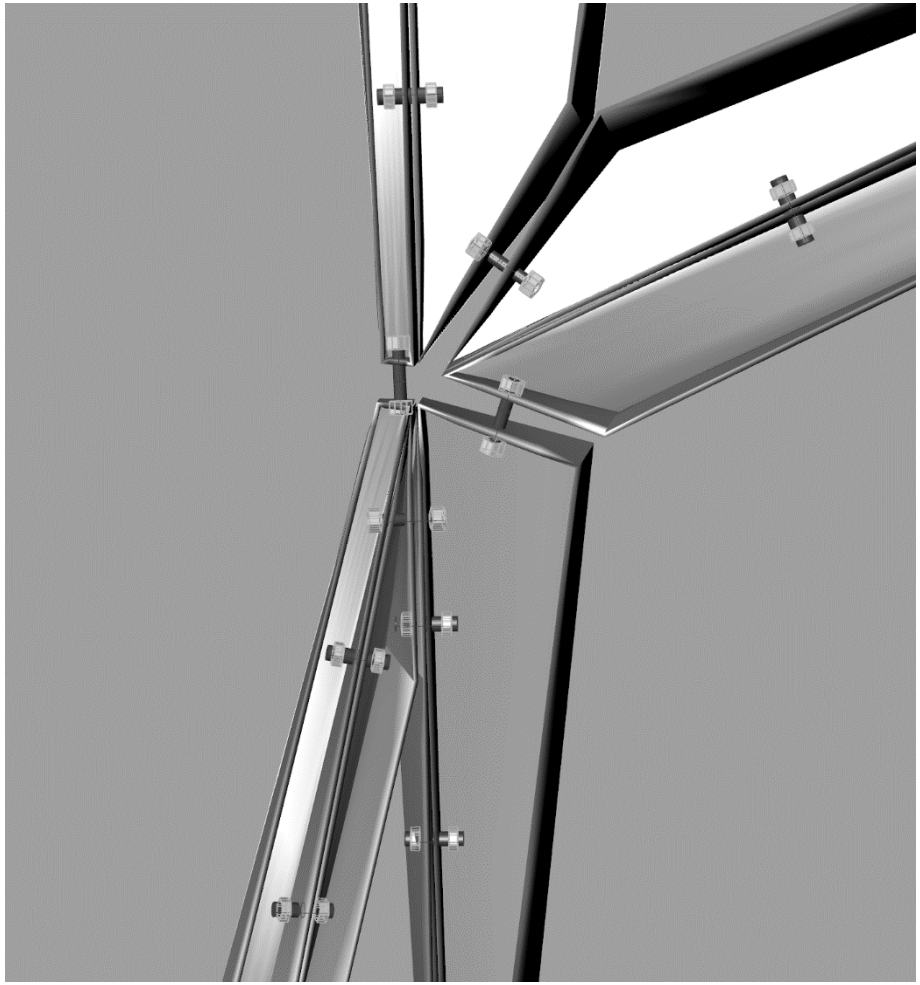


Offset screw holes inwards to make sure each screw is in contact with the board under it. Offset is remapped with length of perimeter because bigger boards has more overhang thus need more offset.

Remap numbers of screw holes based on perimeter of each board, bigger boards needs more screws (2-10)

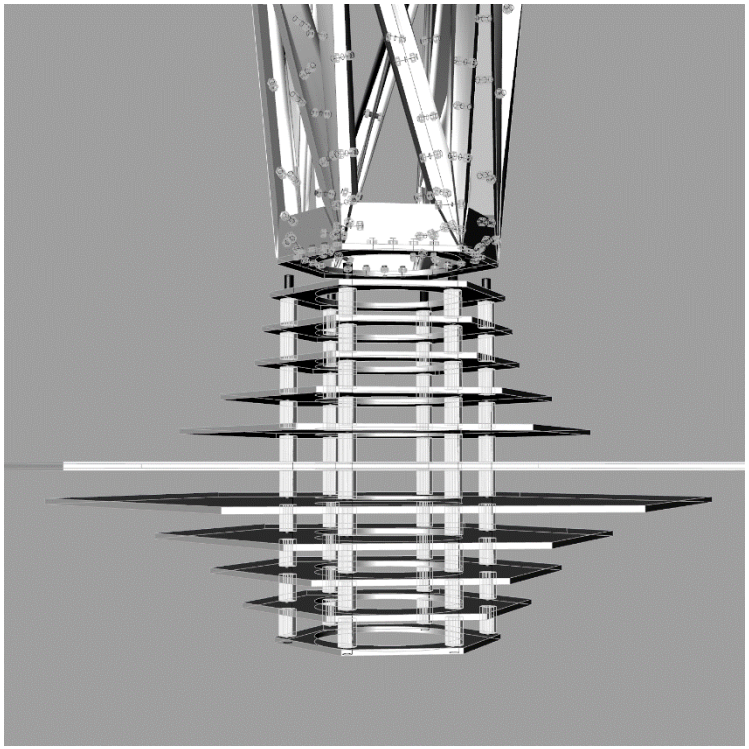
Sheet Metal Version

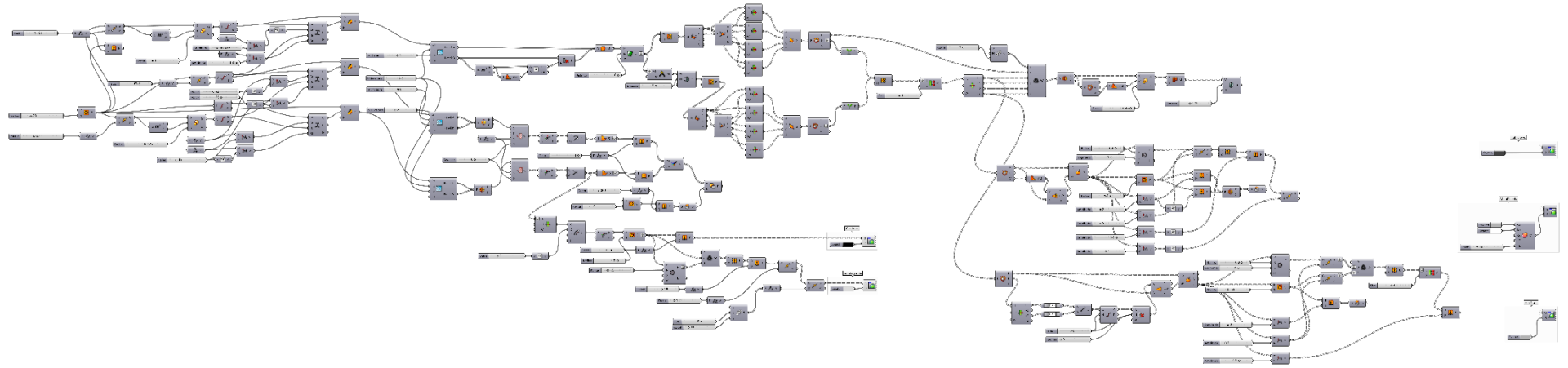
Fabrication



Sheet metal will be cut by water jet, then bent by robotic arms to get curvature and flange. A set of set screws and nuts will bridge the bent metal pieces together.

At the seat area, flat steel sheet will be stacked and joined by threaded steel rods and coupling nuts.

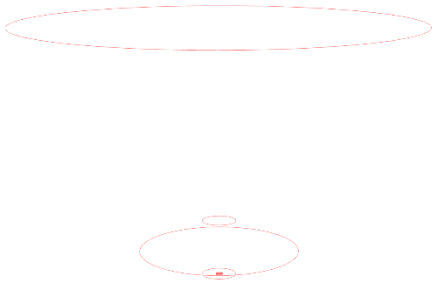




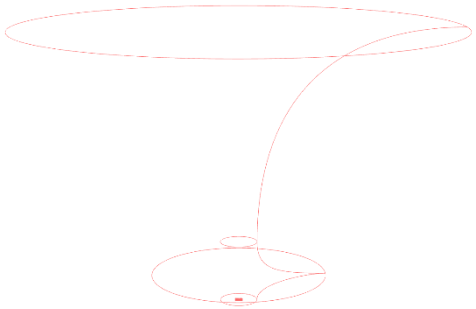
Process

Base Surface → Corolla Skeleton → Create Flange → Create Joints

Base Surface

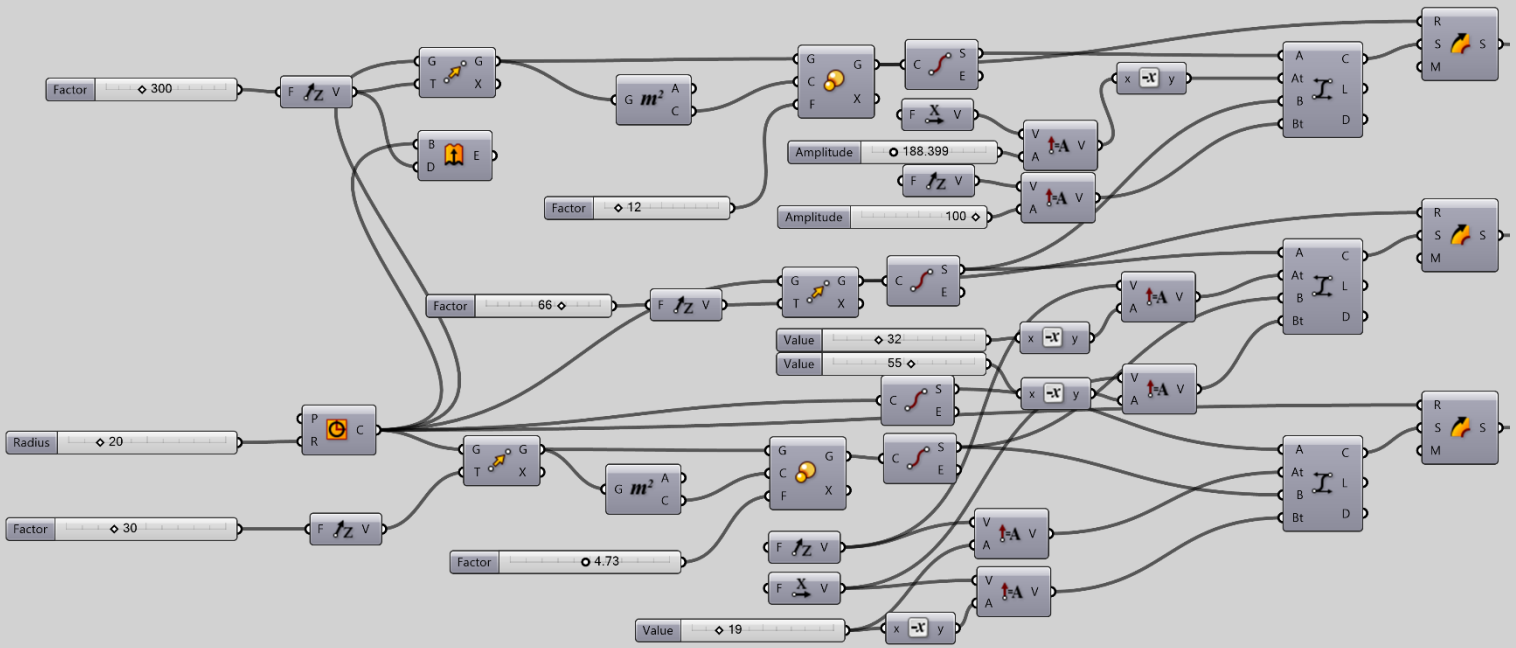


Circles

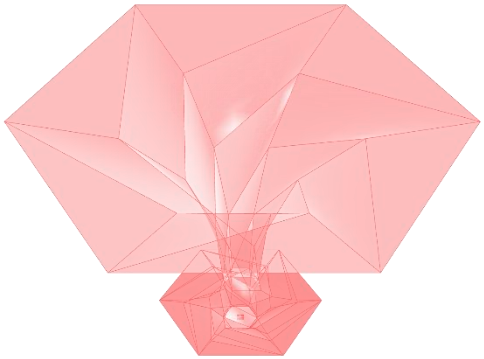


Profile Curve

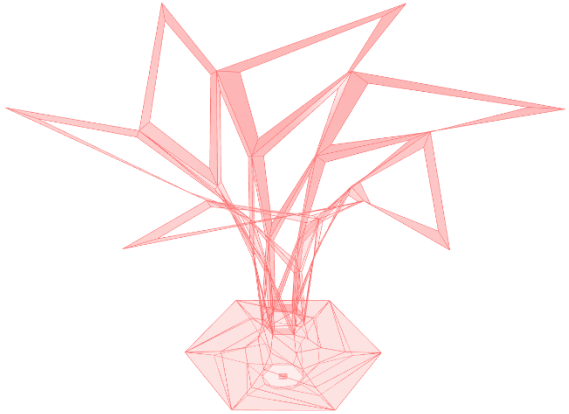
Sweep Surface



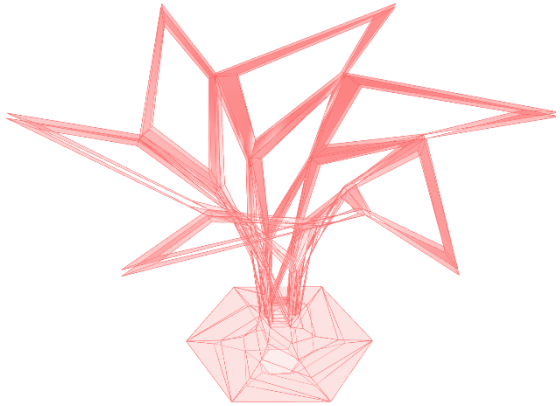
Corolla Skeleton



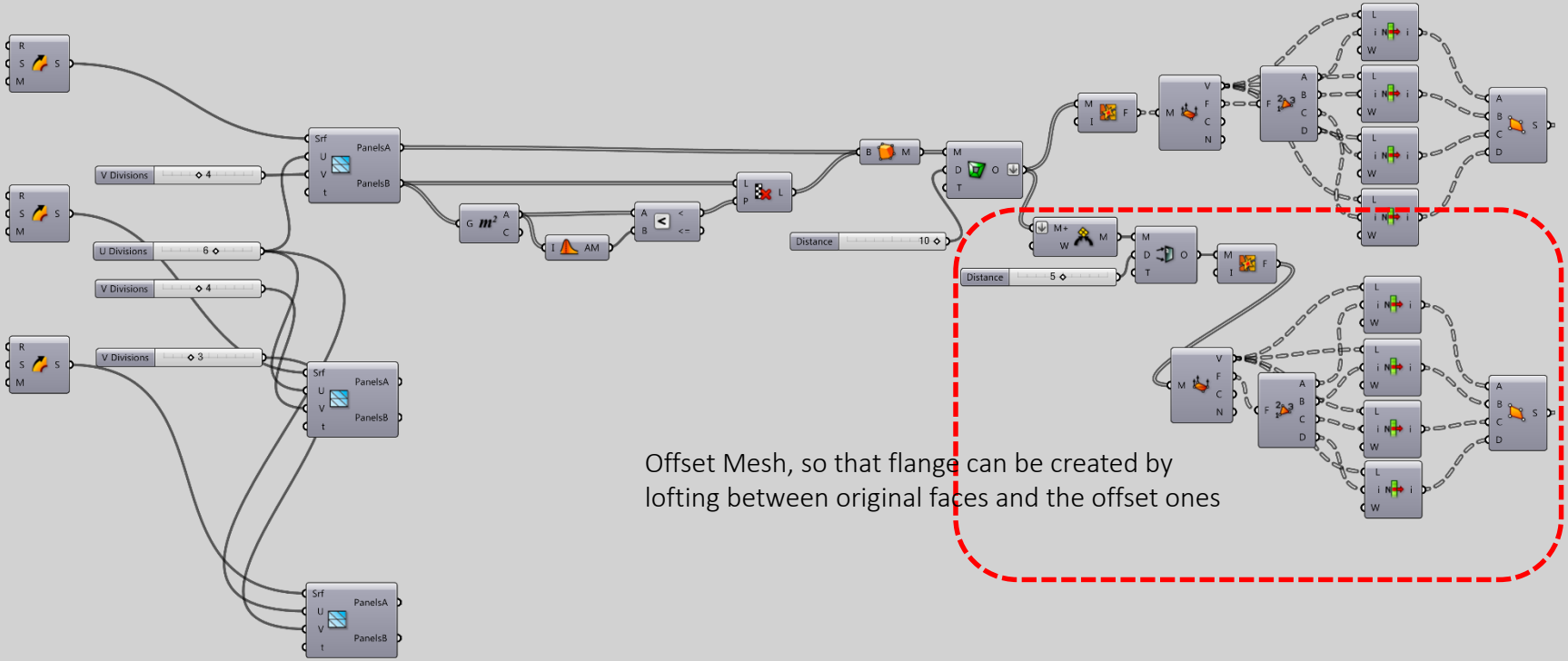
Skewed Quad Panel



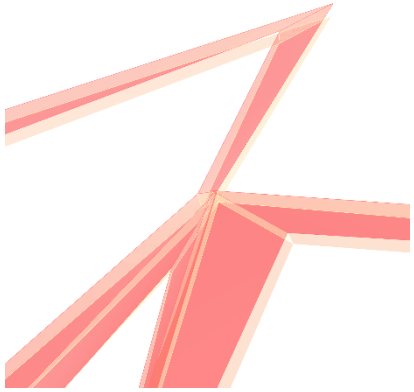
Mesh Frame



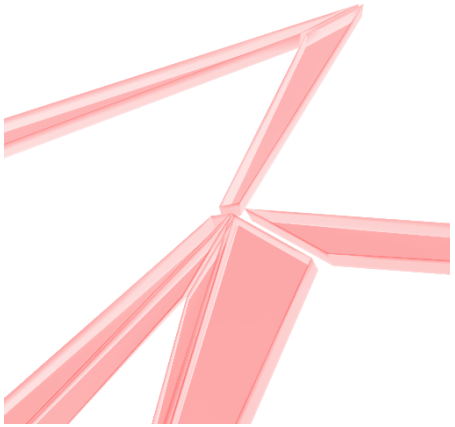
Offset mesh / convert mesh back to NURBS



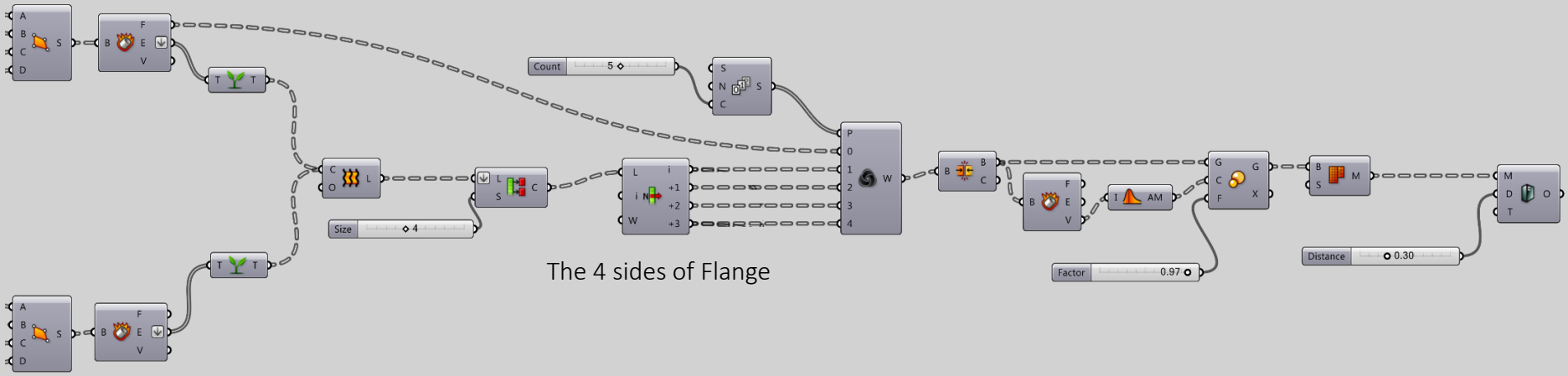
Create Flange



Create Flange by lofting / Join Flanges and Faces



Create gaps and thickness
(Just For Visual effect)

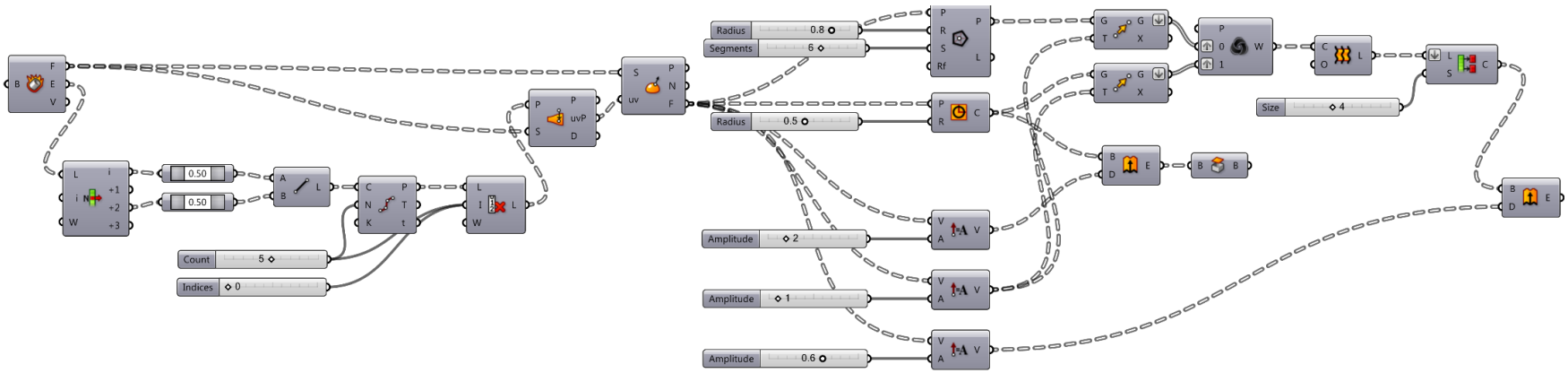


The 4 sides of Flange

Create Joints

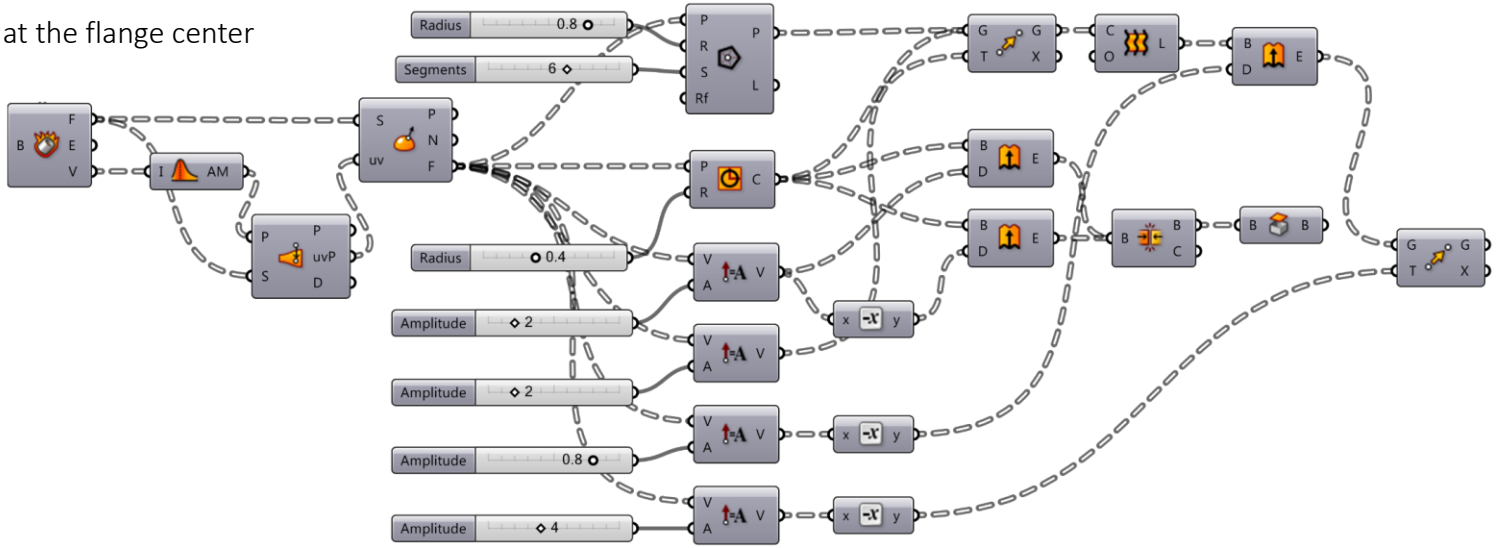
Joints on longer flanges

4 screws on the center line of flange



Joints on shorter flanges

One screw at the flange center




THANK YOU
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