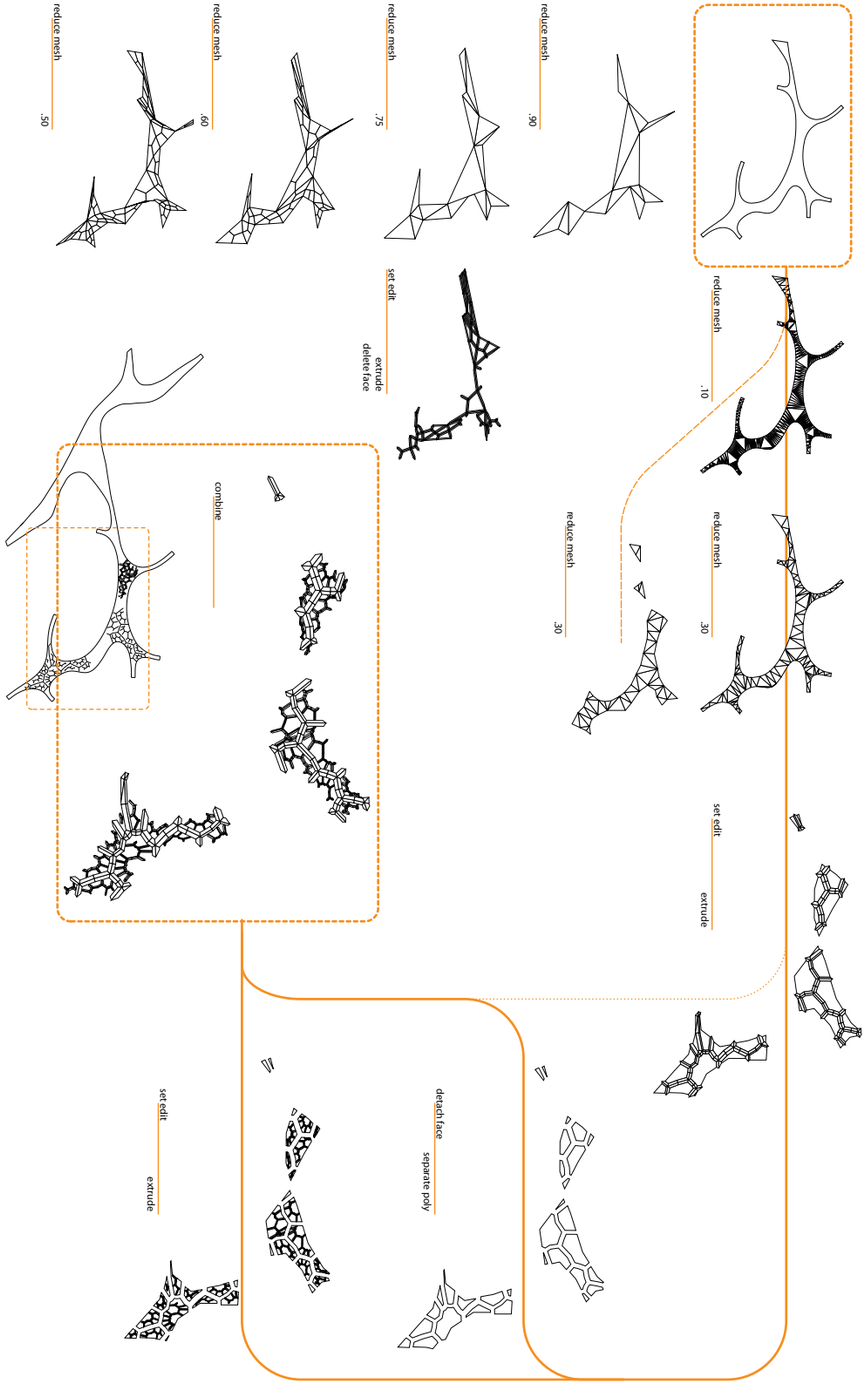
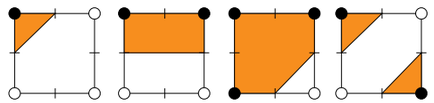


Through a series of generative surface reconstructions, the original surface of the pavilion was reduced to a series of connective paths.

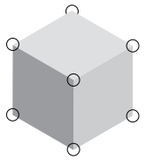
Branching Path Development

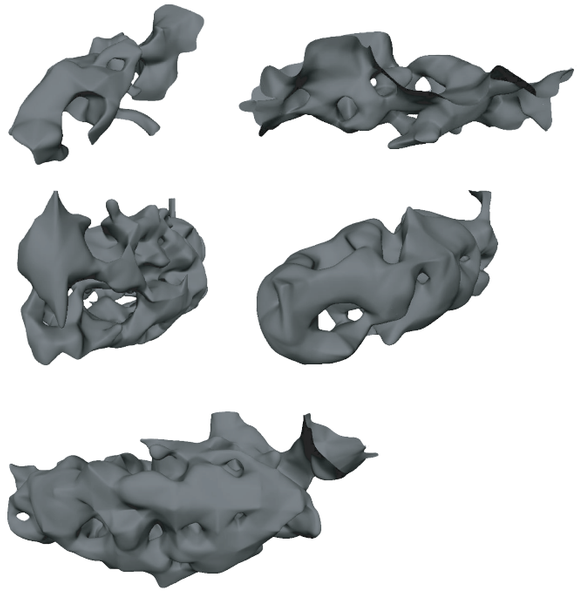
The marching cubes algorithm is often used in volume rendering to construct an isosurface from a 3D field of values. The 2D analog equivalent would be to take an image, and for each pixel, set it to black if the value is below some threshold, and set it to white if it is above threshold. The smooth the jagged black outlines by skinning them with lines. When considered in this manner, the algorithm is very similar to the methods implemented in earlier Generative Components models.



2D examples showing the cubes and their associated surface.

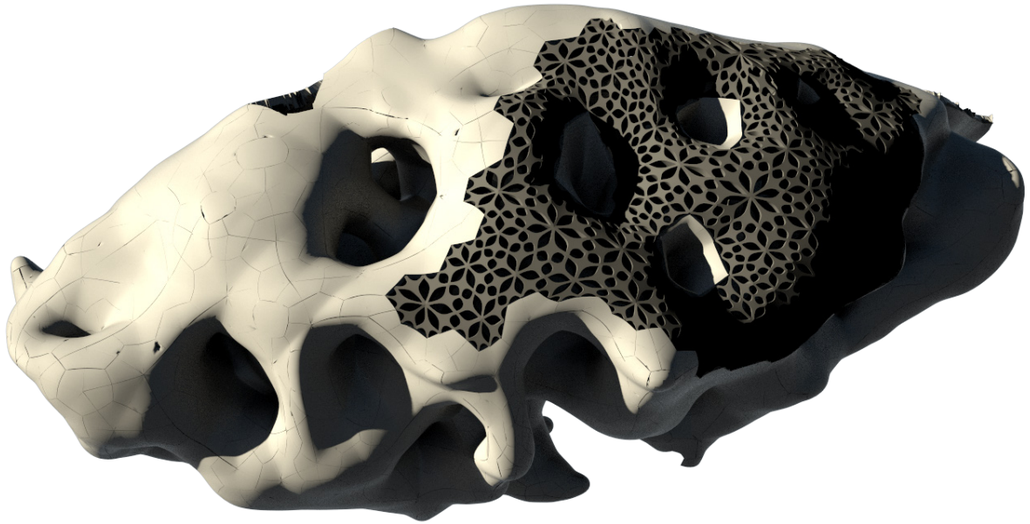
The algorithm tests the corner of each cube in the scalar field as being either above or below a given threshold. This yields a collective of boxes with classified corners. Since there are eight corners with one of two state, there are 256 different possible combinations for each cube. Then, for for each cube, you replace it with a surface that meets the classification of the cube.





Using a point cloud and a system of random point selection, variations of surfaces were generated by adjusting the percentages of points selected. The surfaces were then analyzed for quality of space when measured against the human scale.

Rigorous testing produced a quality global that divides the volumes into adequate units with rich interconnections and blending of spaces with dynamic programmatic implications. The hexagonal surface subdivisions cause very organic patterning and natural variation when proliferated with the basic component.



Marching Cubes Algorithm