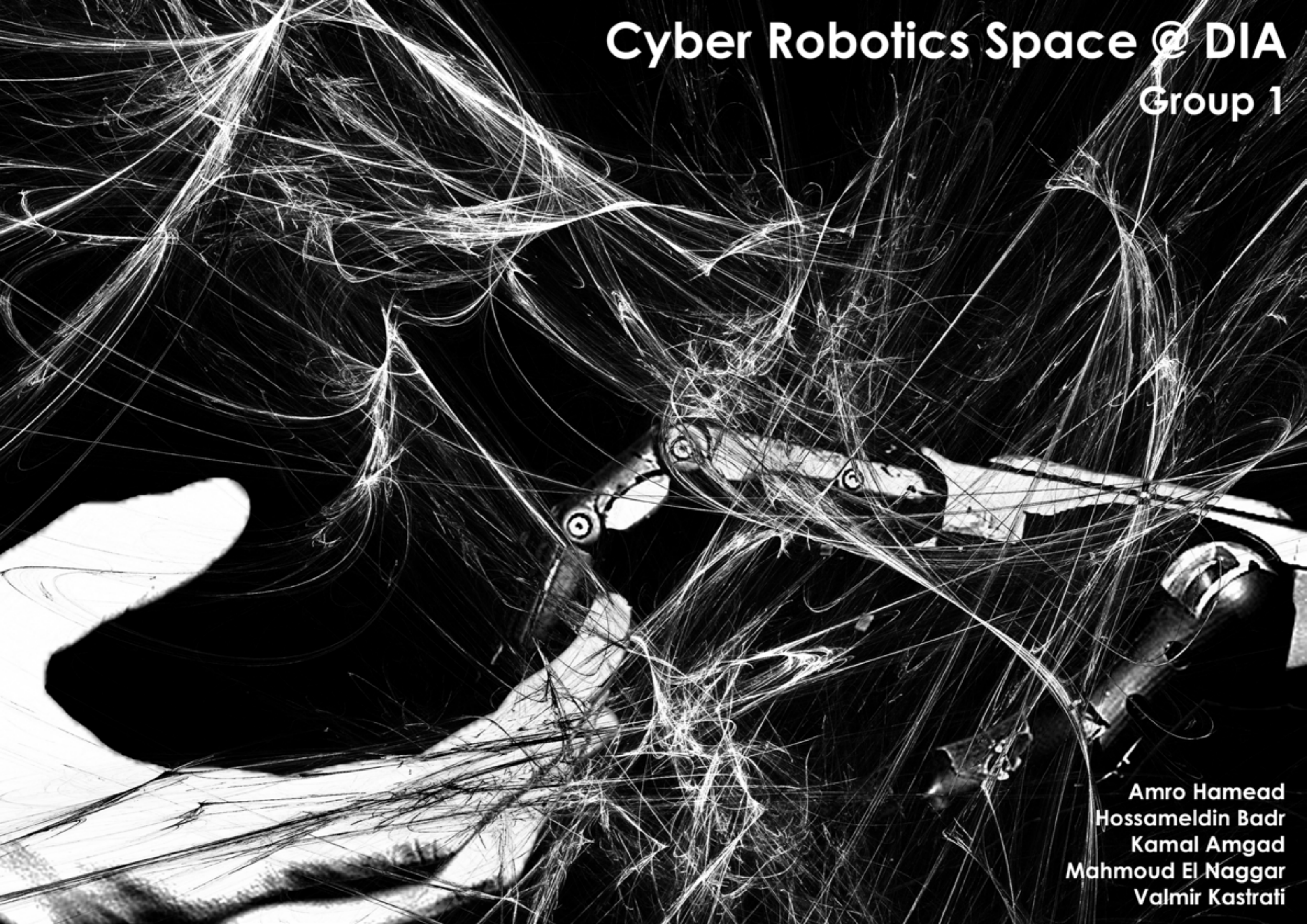


# Cyber Robotics Space @ DIA

Group 1



Amro Hamead  
Hossameldin Badr  
Kamal Amgad  
Mahmoud El Naggar  
Valmir Kastrati



A Venn diagram with two overlapping circles. The left circle is blue and labeled 'TUD Project'. The right circle is red and labeled 'D/A Project'. The overlapping area in the center is shaded and labeled 'THE OPEN SPACE'. The background features a faint grid of binary code (0s and 1s) and a large, light-colored watermark of a building's facade.

## TUD Project

In Between  
buildings  
playground for  
multifunctional  
purposes

**THE OPEN SPACE**

## D/A Project

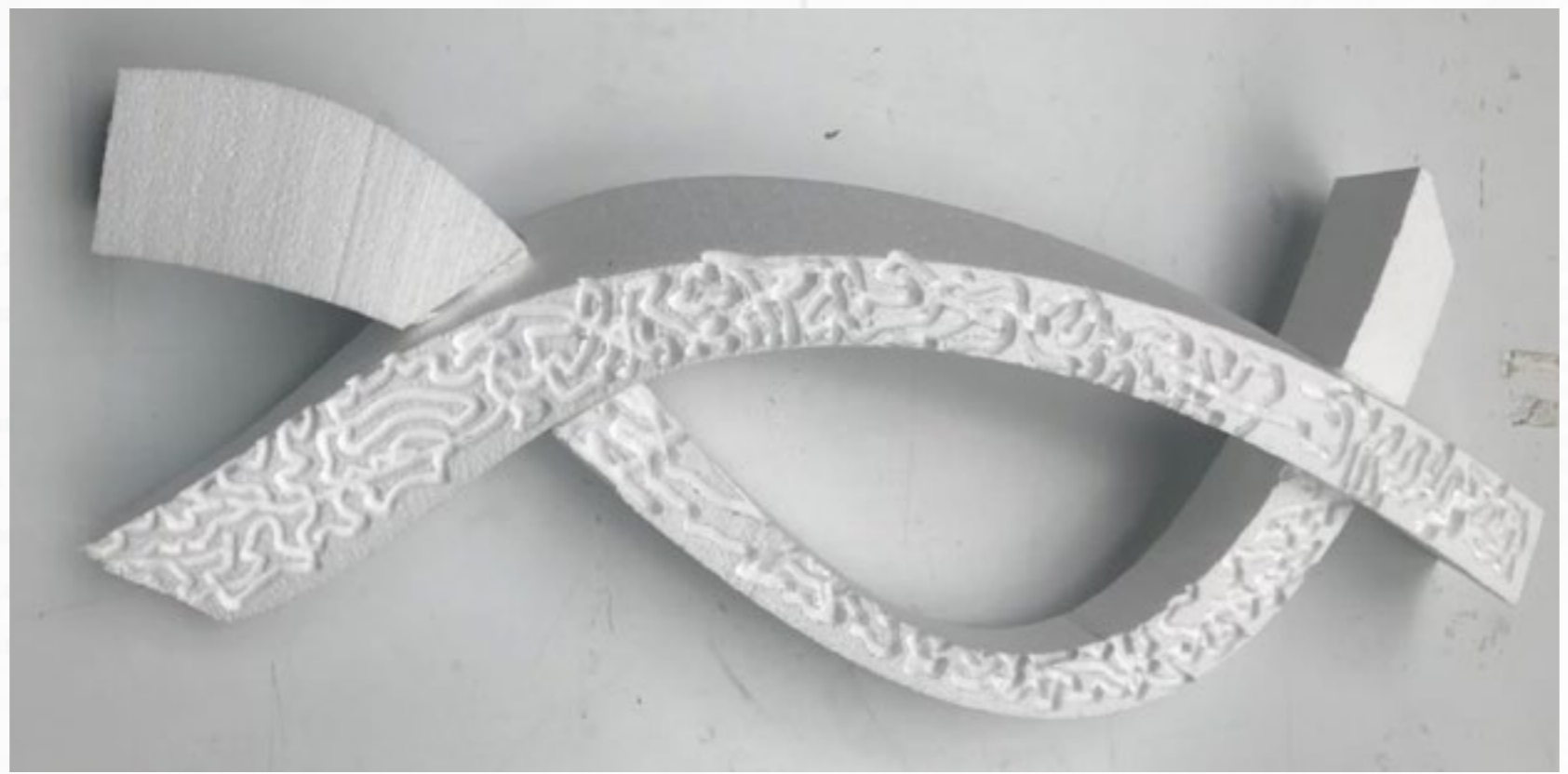
Abandoned  
factory to  
transform into  
contemporary  
arts and production  
space

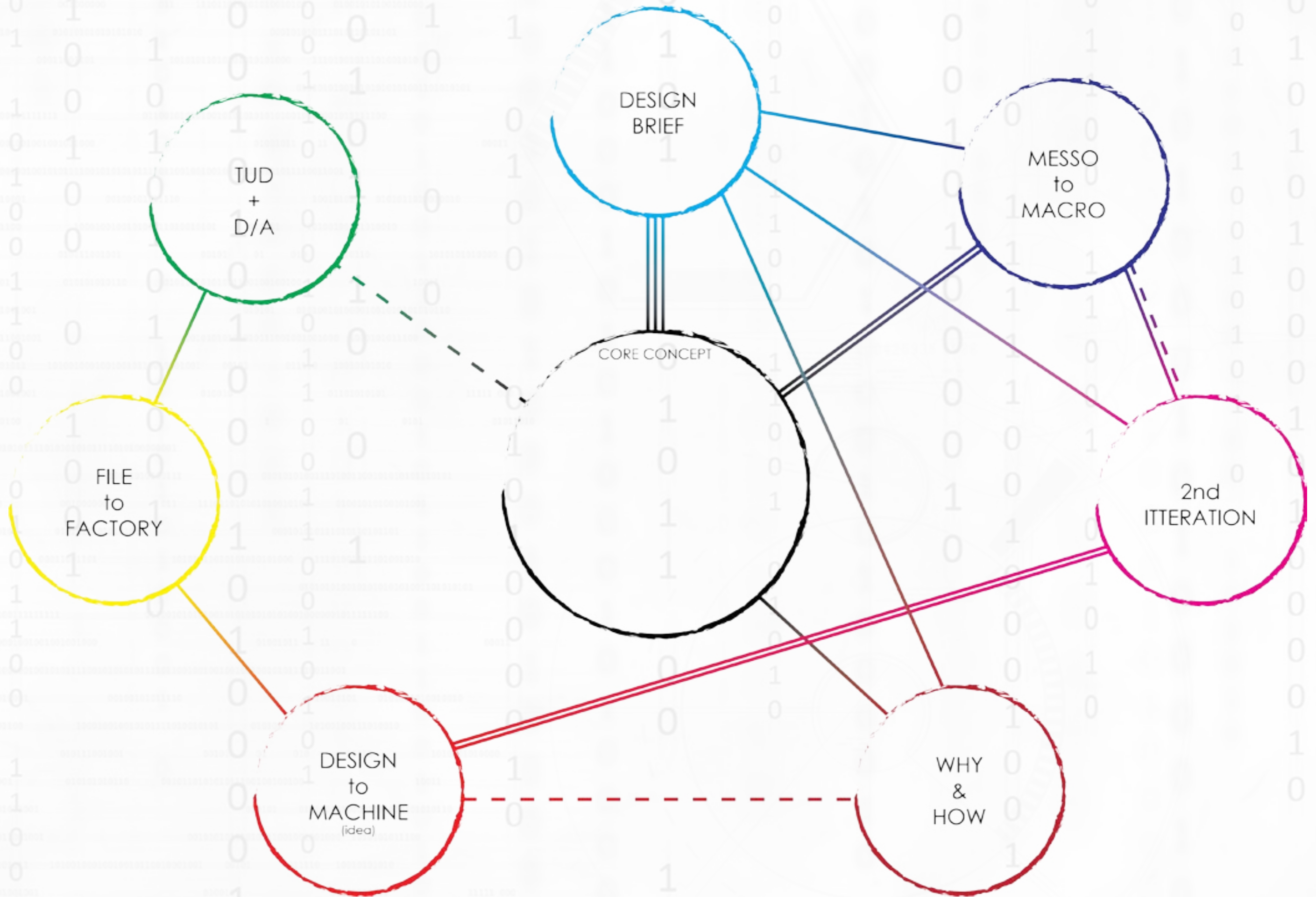


+



DESIGN - KUKA PRC - HOT WIRE CUTTING - MILLING







# DESIGN BRIEF



The scope of this project is the idea of creating the conceptual "OCCUPIED" from "VOID". Referring to the abandoned factory by the term Void, after all the site analysis, the fulfilling of the areas potential is a great challenge. It's the synonym of respawning something that has been gone for as long as it is remembered.

By creating a space where every rank of artists has the possibility to expose their work, and a large production space where art and architecture is created itself would be targeting the majority of the market audience.

The hybridity of functionality that it shall offer has an attempt to revive the entire south of Dessau.

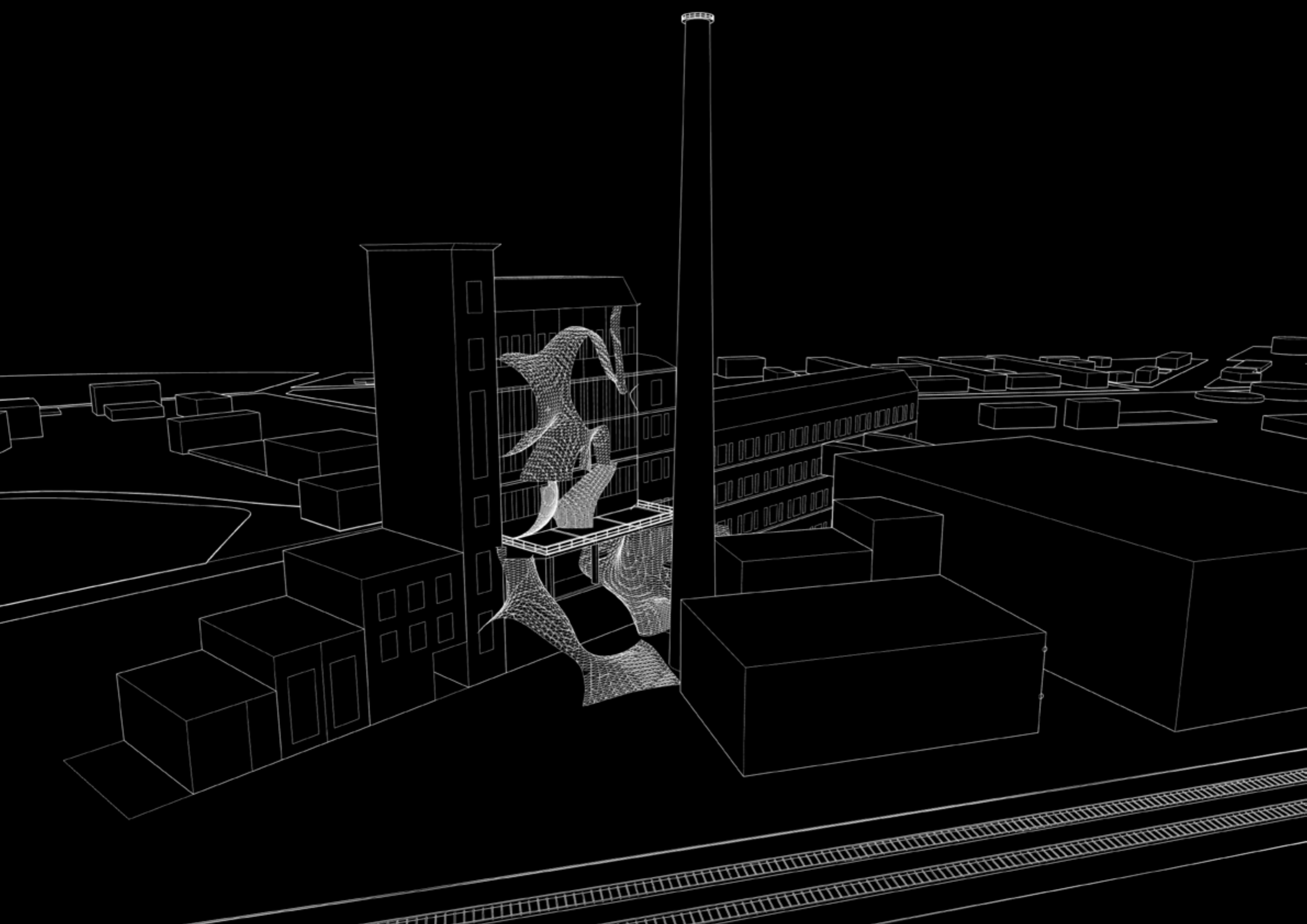
By putting the ultimate goal to robotically generate a 1:1 prototype of a part of the design, starting from the concept/inspiration, analysis, Macro Scale Design; Messo Scale Design; Micro Scale Design, this will generate a parametrically robotic generated design flow which fits the core concept and the functionality.

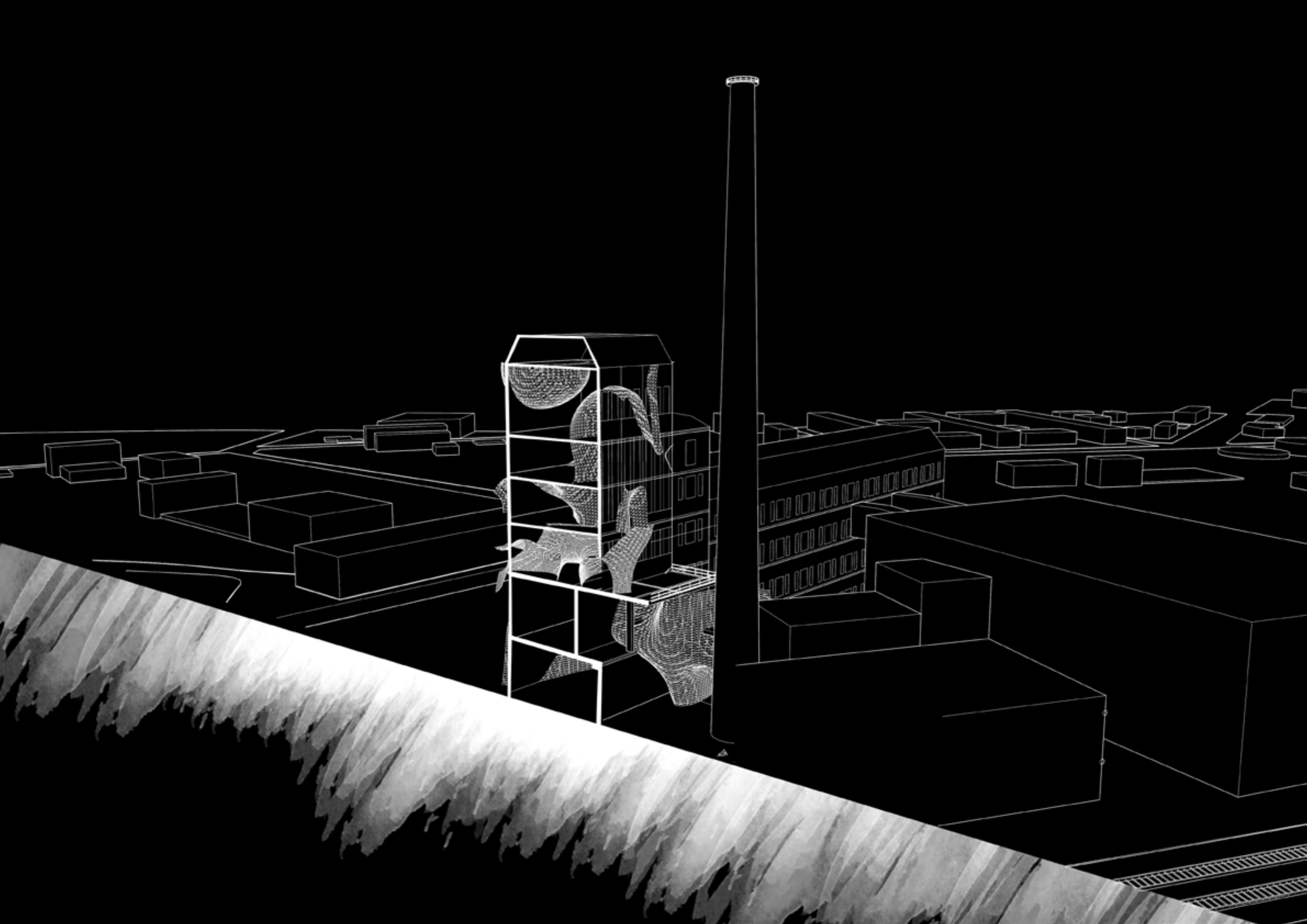


### ISOSURFACE Application on existing building.

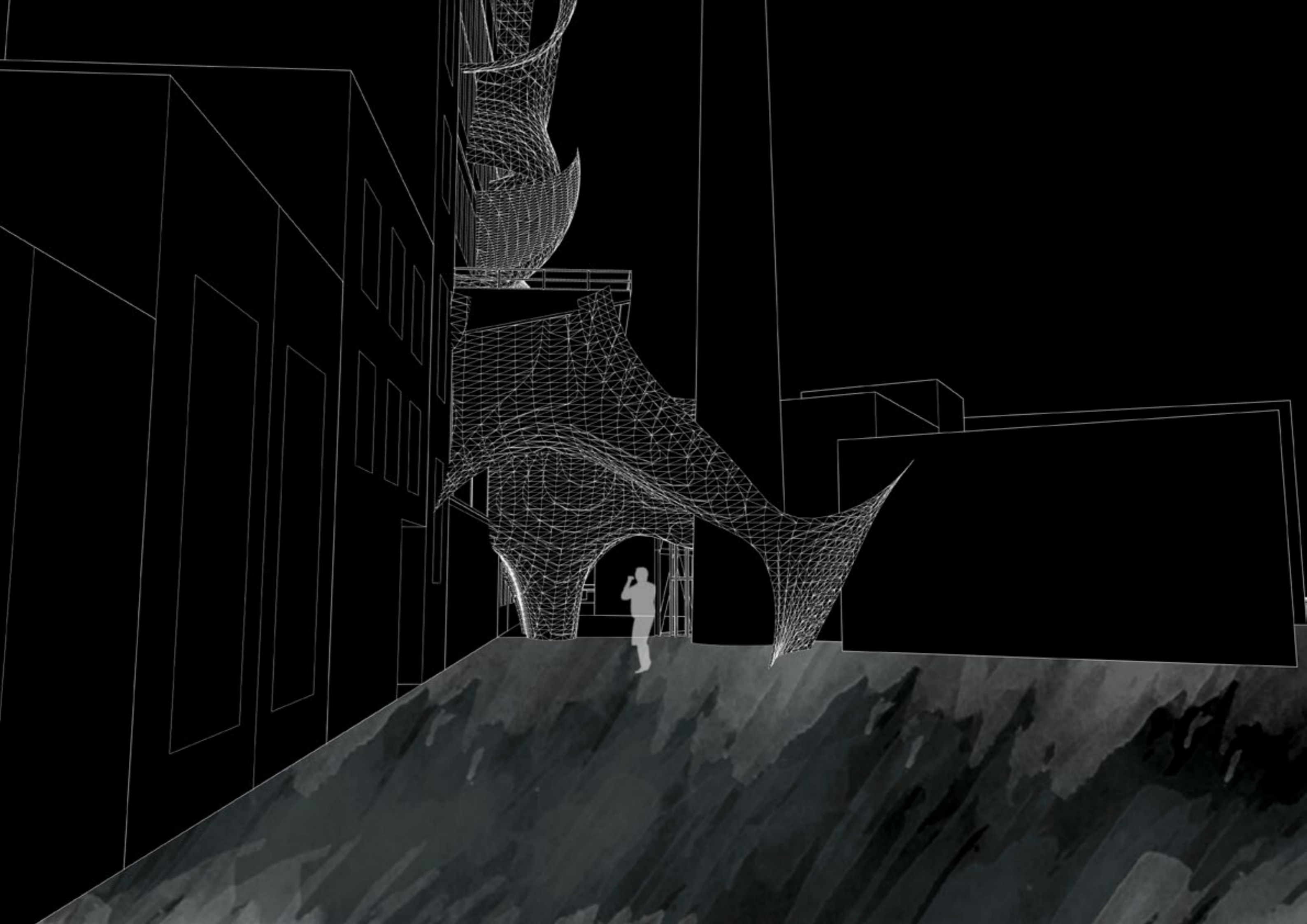
This operation was undertaken within the framework of an existing building shell. Existing space is perceived as a field charged with potential, which is eroded through the displacement of particles within a self-organising system. A threshold of density generated by this erosion is extracted as a surface through the tomographical technique of isosurfacing. The resultant porous form creates a spatial organisation based on connections, both circulatory and visual. The implication of the project lies in the capacity of the design process to act directly upon form, rather than a translation of a generative diagram into architecture.

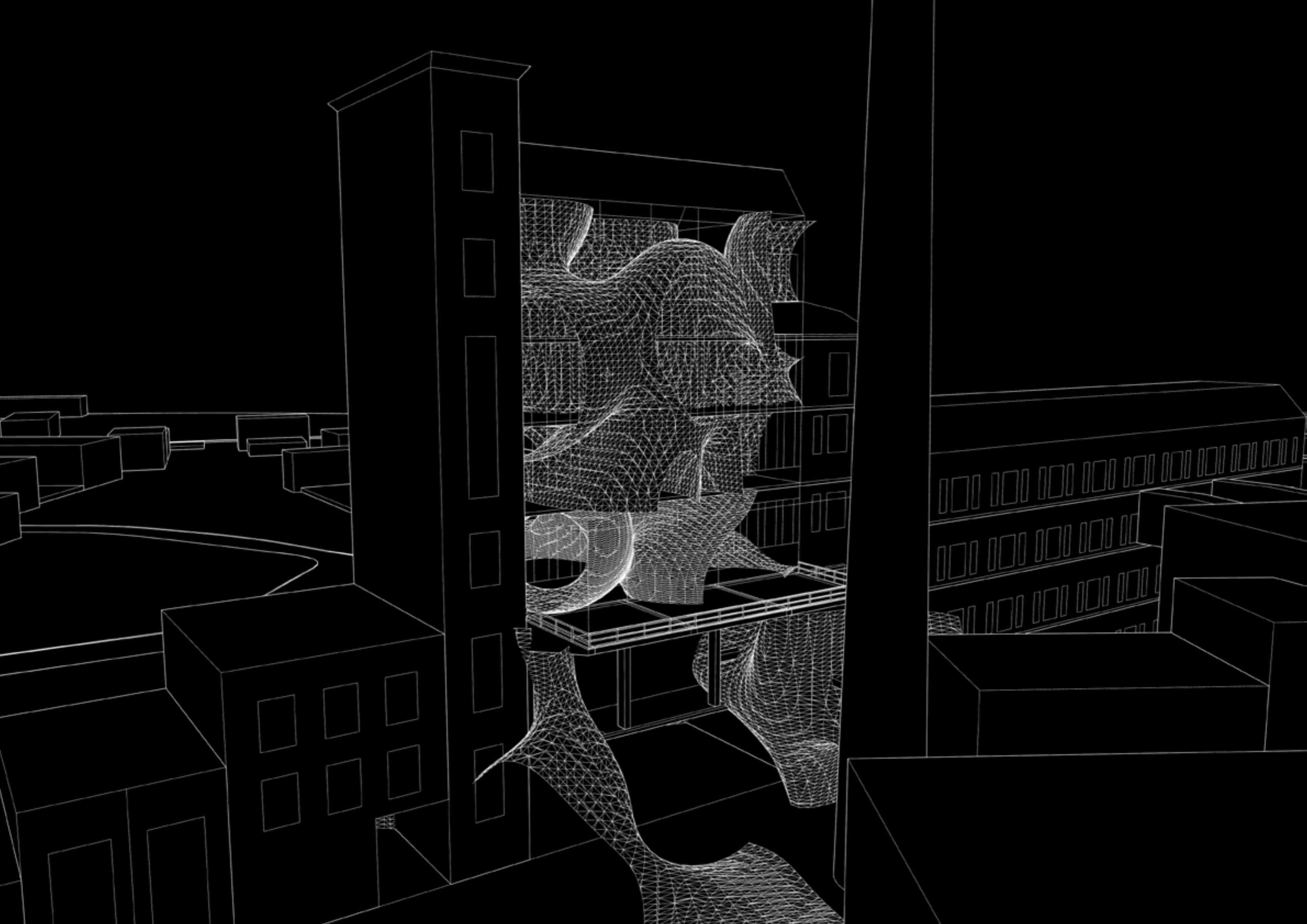














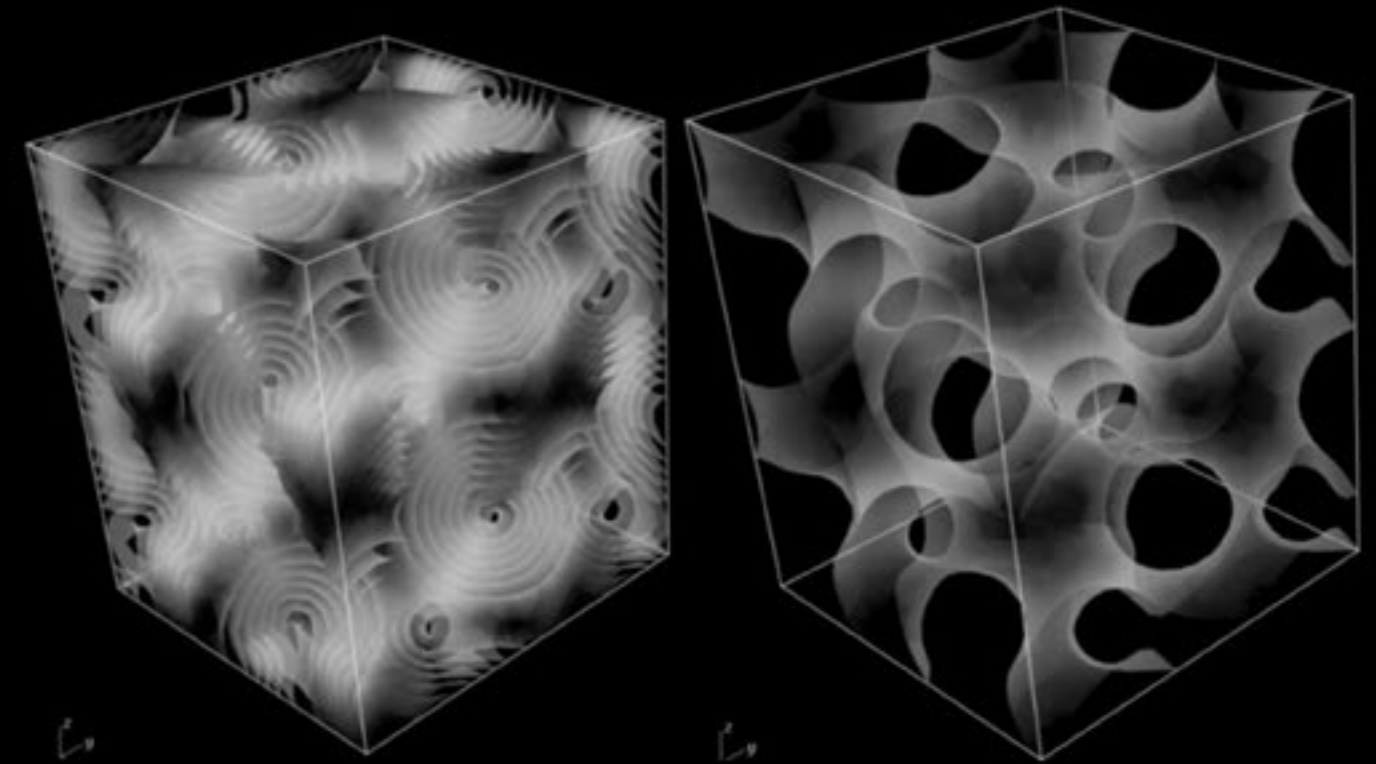




# ISOSURFACE

Micro scale

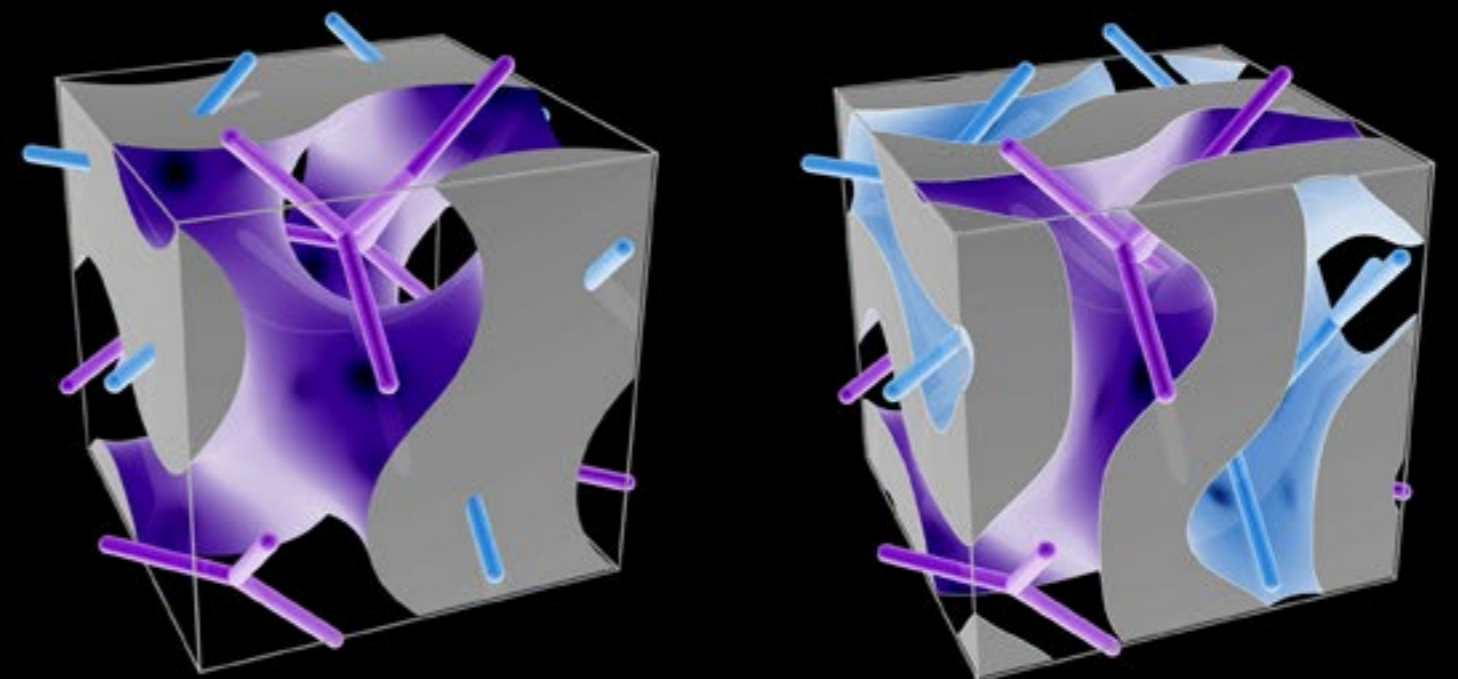
An isosurface is a three-dimensional analog of an isoline. It is a surface that represents points of a constant value (e.g. pressure, temperature, velocity, density) within a volume of space; in other words, it is a level set of a continuous function whose domain is 3D-space.



## Minimal surface scaffold design

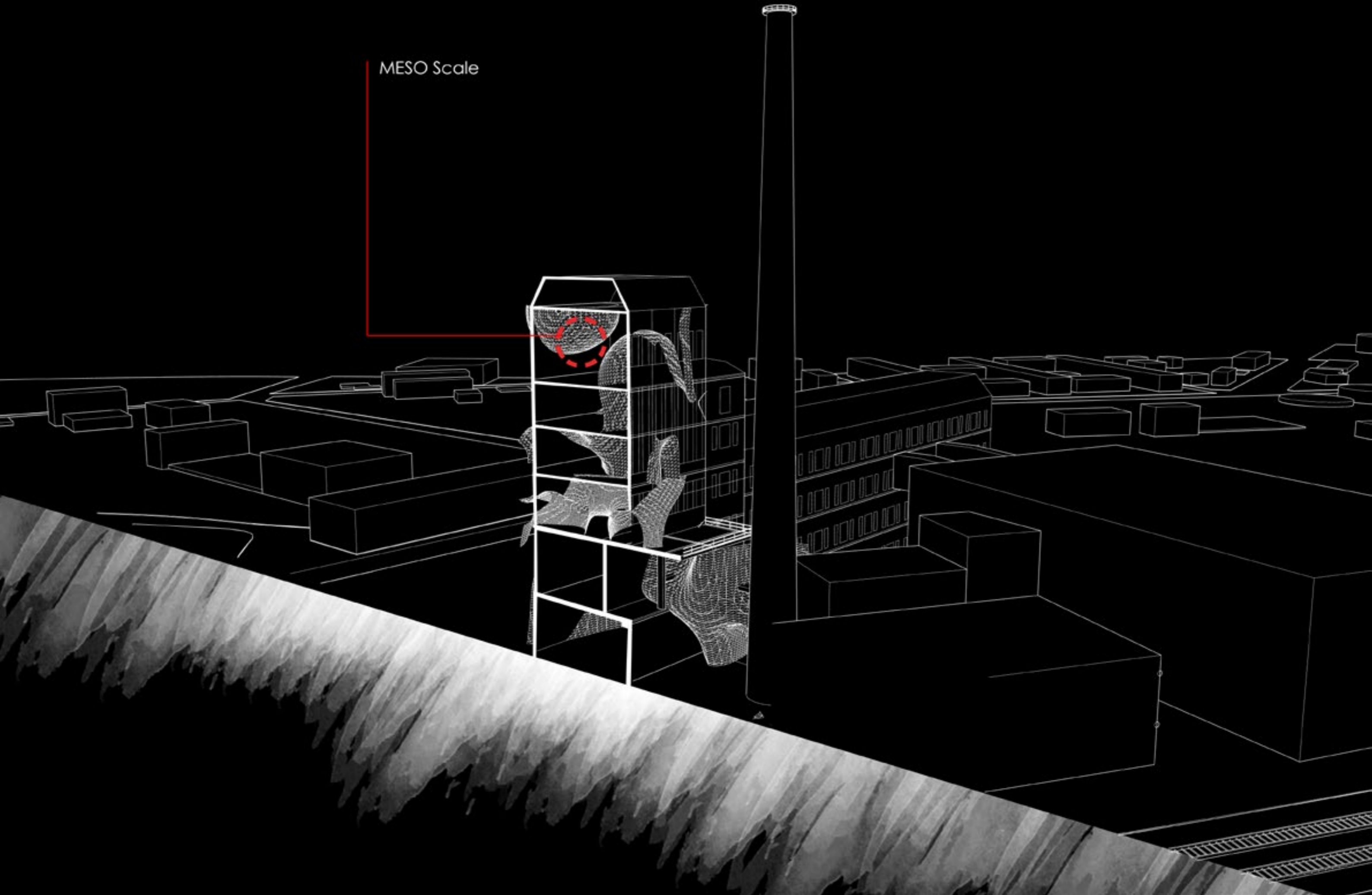
Meso scale

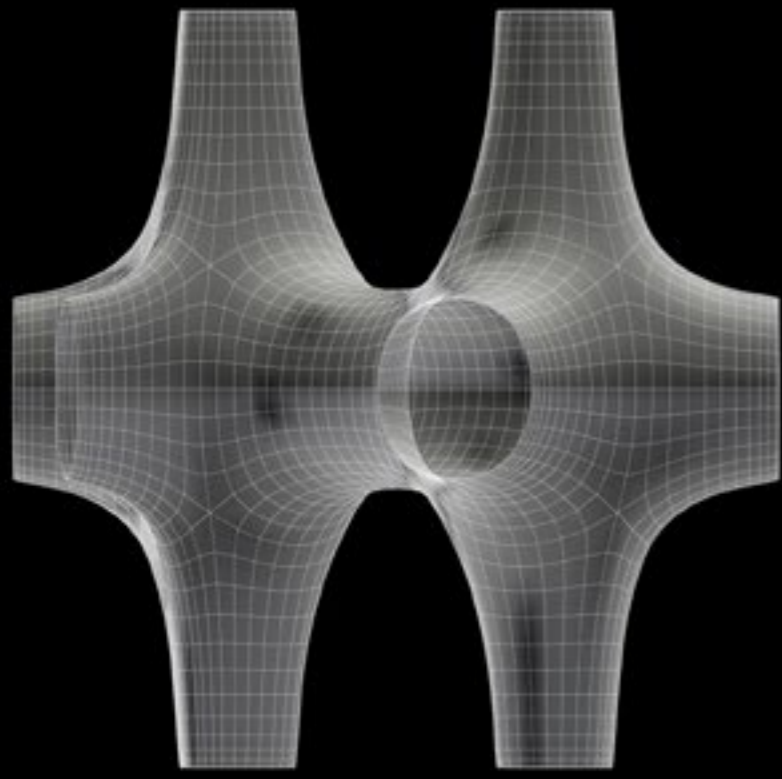
Scaffolds designs of 50% volume fraction derived from the Gyroid minimal surface. Left: Network solid architecture. The minimal surface partitions space into two interwoven domains. One is filled with an isotropic elastic material, the other is left empty (void domain). Right: Sheet solid architecture: The solid domain is given by a sheet of thickness  $r$  folded onto the Gyroid minimal surface. The value of  $r$  is adjusted to yield a volume fraction of 50%.



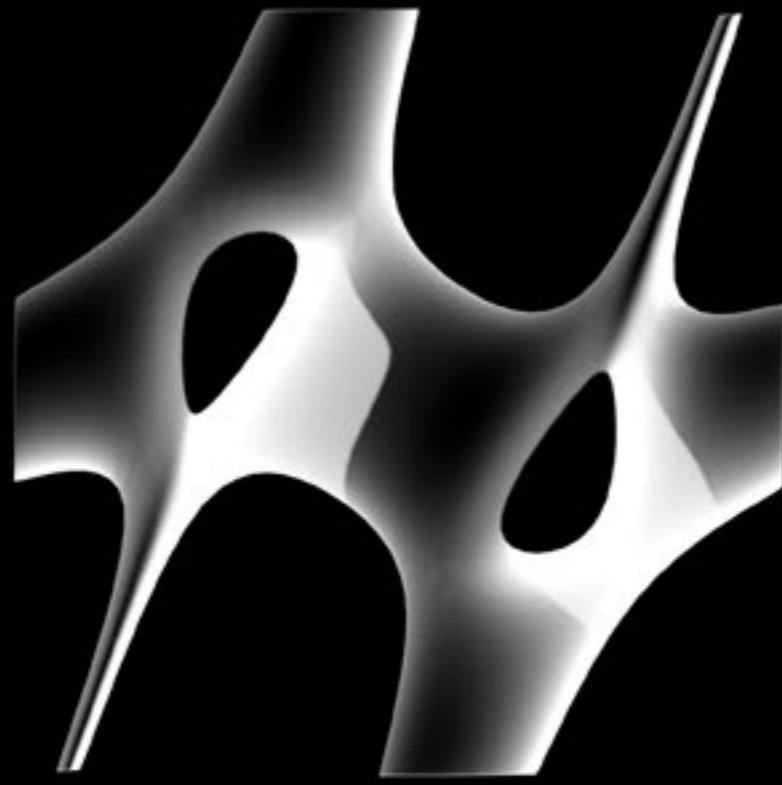


MESO Scale





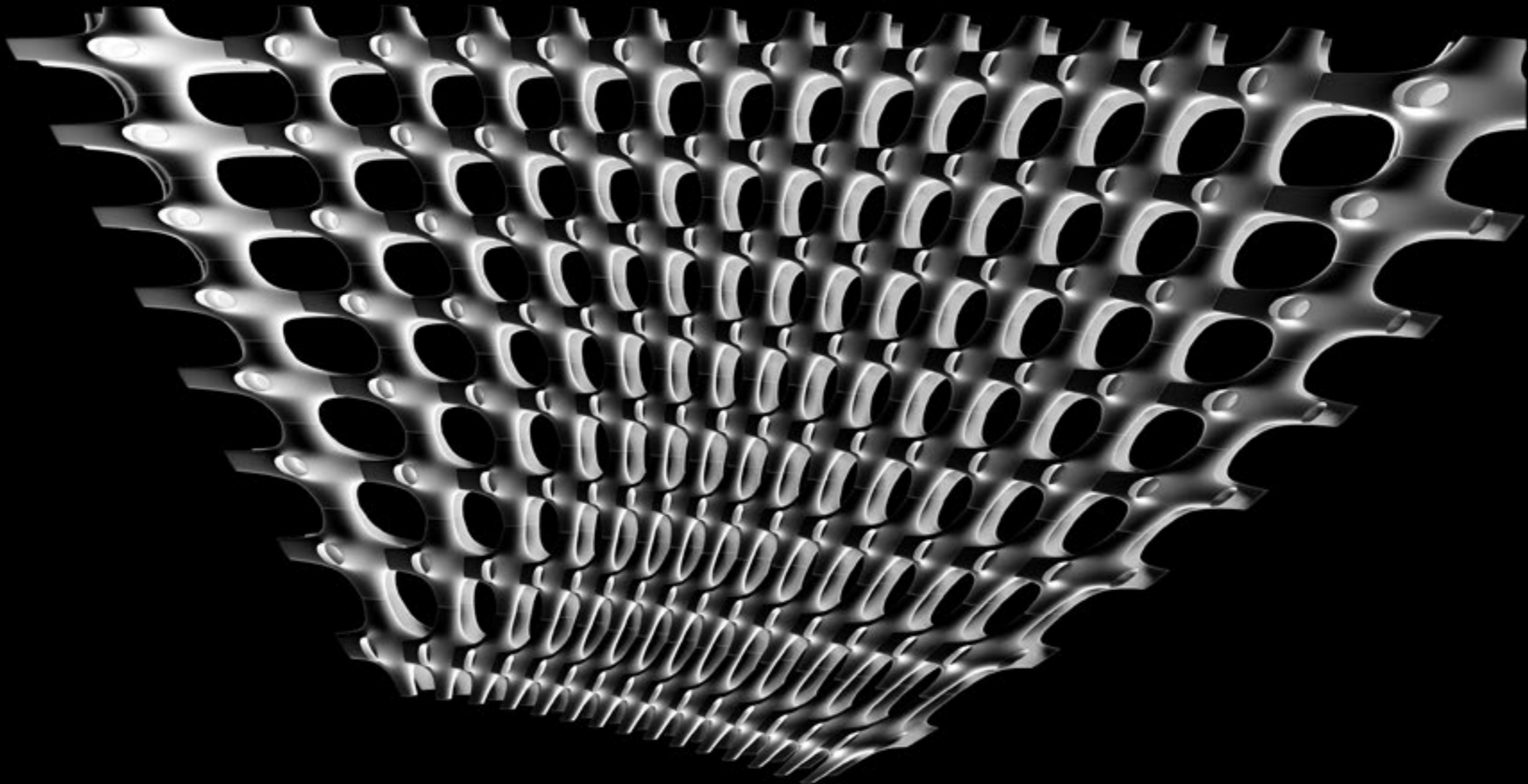
FRONT



TOP



VIEW



MORPHING ON THE SURFACE