GENETIC OPTIMIZATION |

Optimization of a food distribution matrix for Physarum Polycephalum

Master in Advanced Architecture
SO.8 Computational Design

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Optimization of a food distribution matrix for Physarum Polycephalum

This project explores the design possibilities through the research of the protist organism Physarum Polycephalum, also known as Slime Mould, and proposes an innovative material system for architectural purposes. The growing slime mould inside the layers will display its own pattern by foraging on the nutrients we provide. It will grow according to where you place the food, this will happen with an X and Y axis machine that will distribute the nutrients it needs for it to grow.

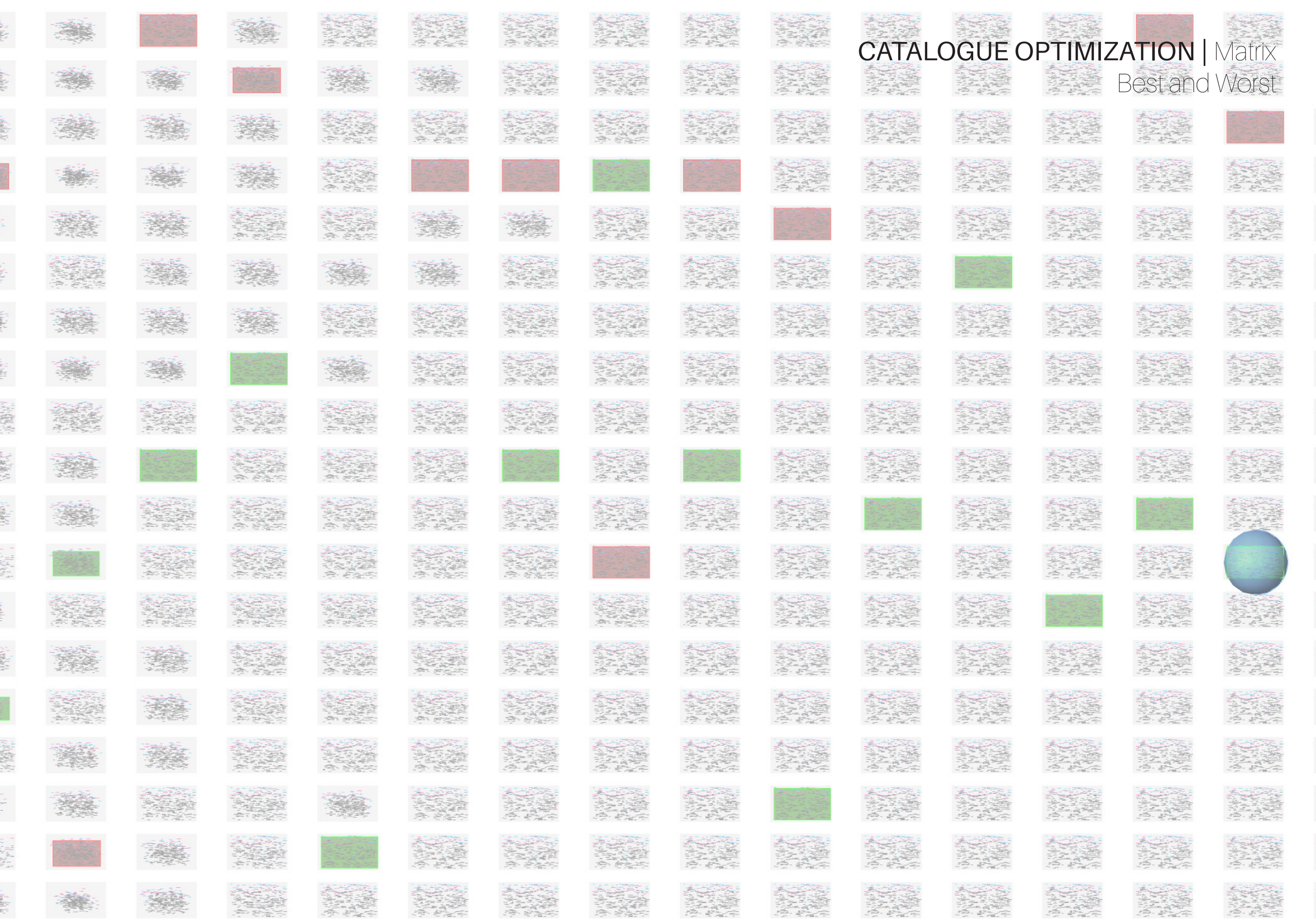
Creating a 3D matrix to optimize the 3 layers panel where the Physarum is going to grow by manipulating the position where the food will be dropped by the machine.

The Fitness Value is based on this parameters:

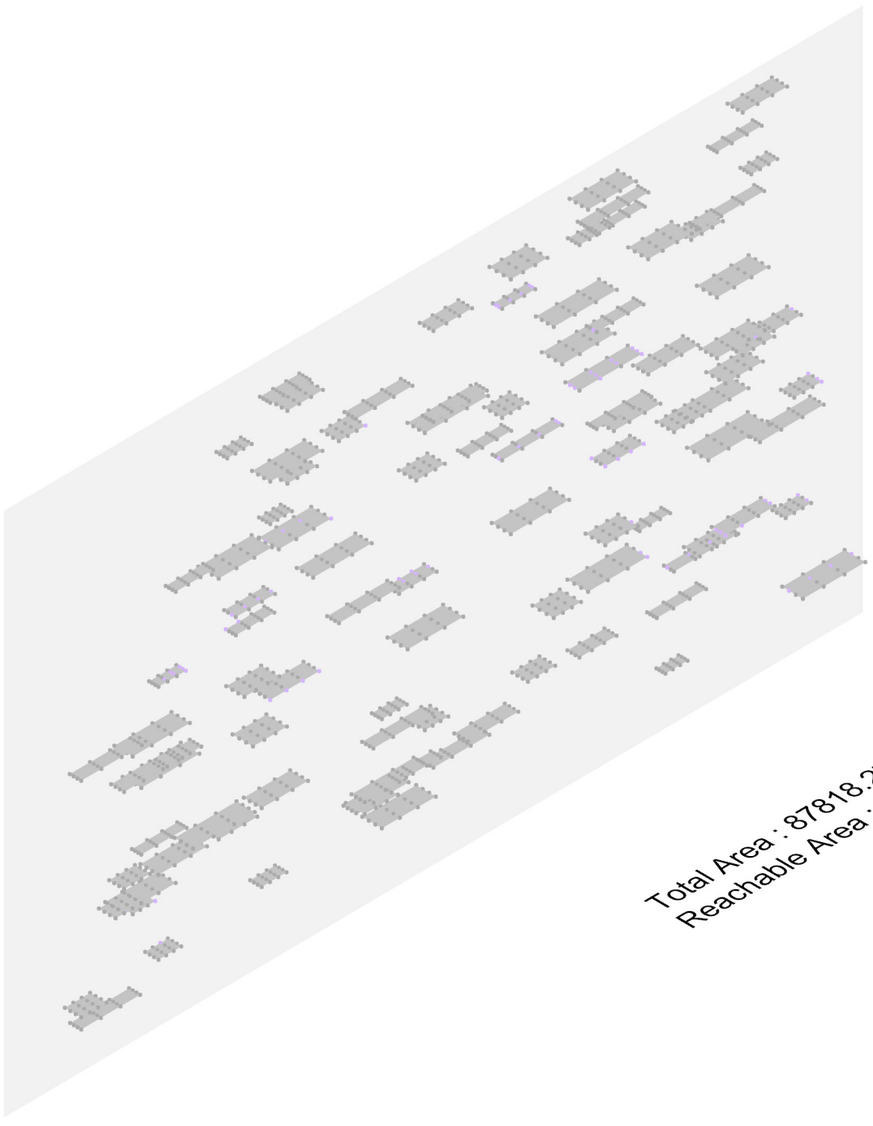
- All the surfaces need to stay within the panel.
- They cannot intersect within their own layer.
- Positioning of the surfaces cannot overlap between the 3 layers.
- They all have exposure to the axis machine that drops the food.

CATALOGUE OPTIMIZATION | Matrix

CATALOGUE OPTIMIZATION | Matrix
Best and Worst

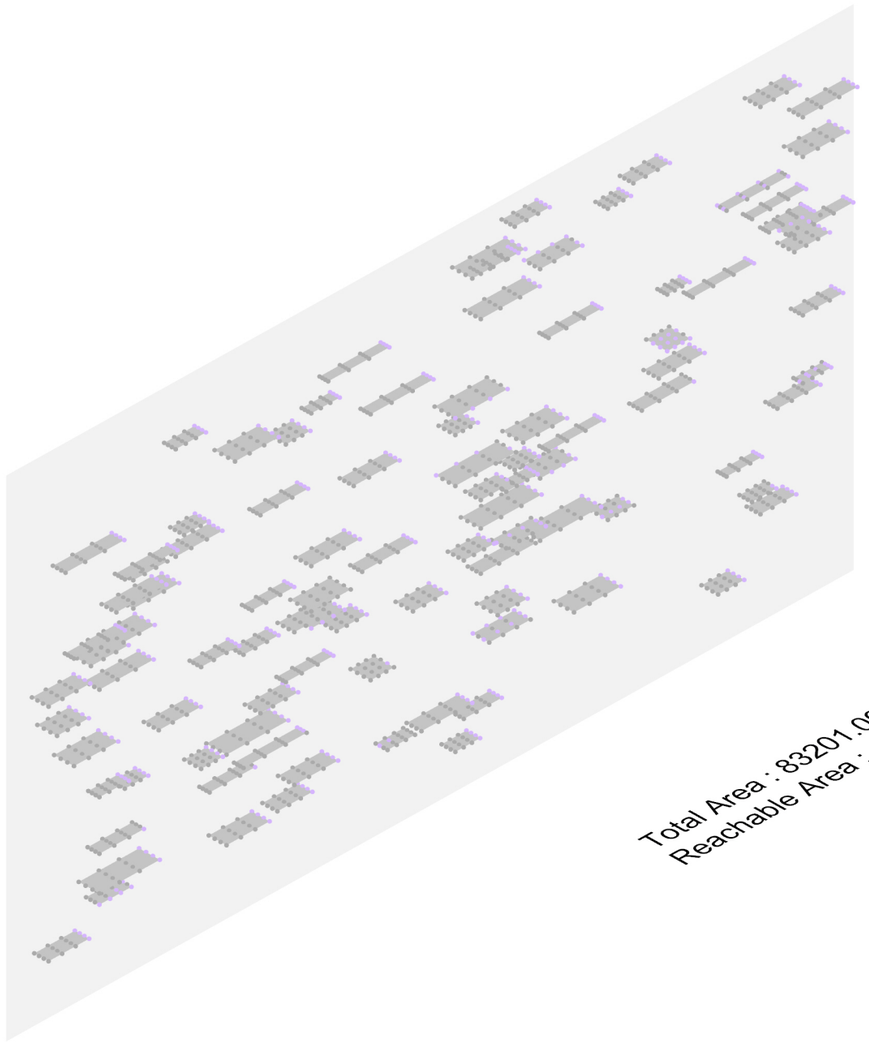


Pre-Optimization of 1 layer



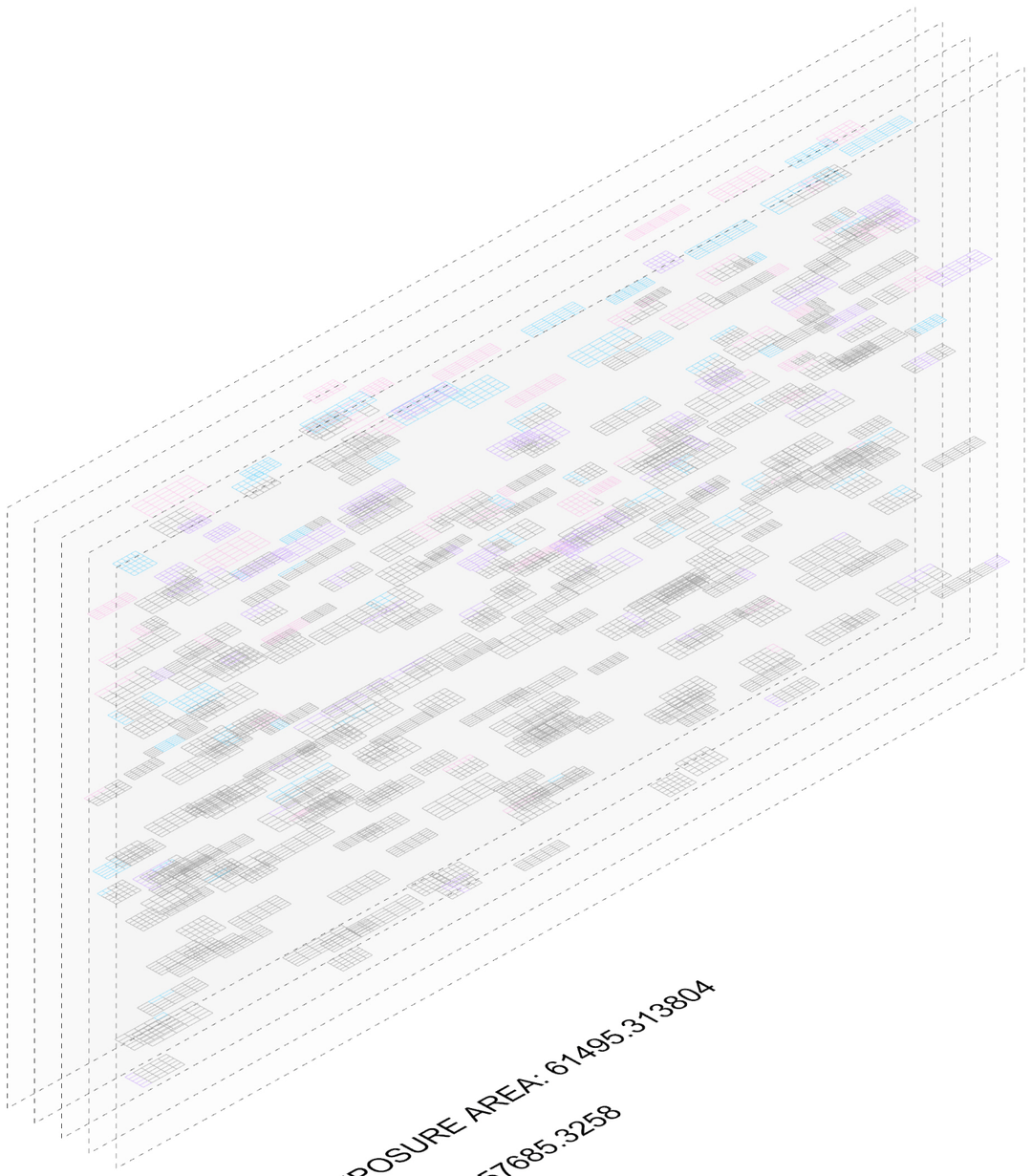
Total Area : 87818.2727
Reachable Area : 33087.5534

Post-Optimization of 1 layer



Total Area : 83201.0947
Reachable Area : 41270.9591

Pre-Optimization of the 3 layers



TOTAL EXPOSURE AREA: 61495.313804

TOTAL AREA: 257685.3258

Post-Optimization of the 3 layers



TOTAL EXPOSURE AREA: 64596.344148

TOTAL AREA: 262456.149