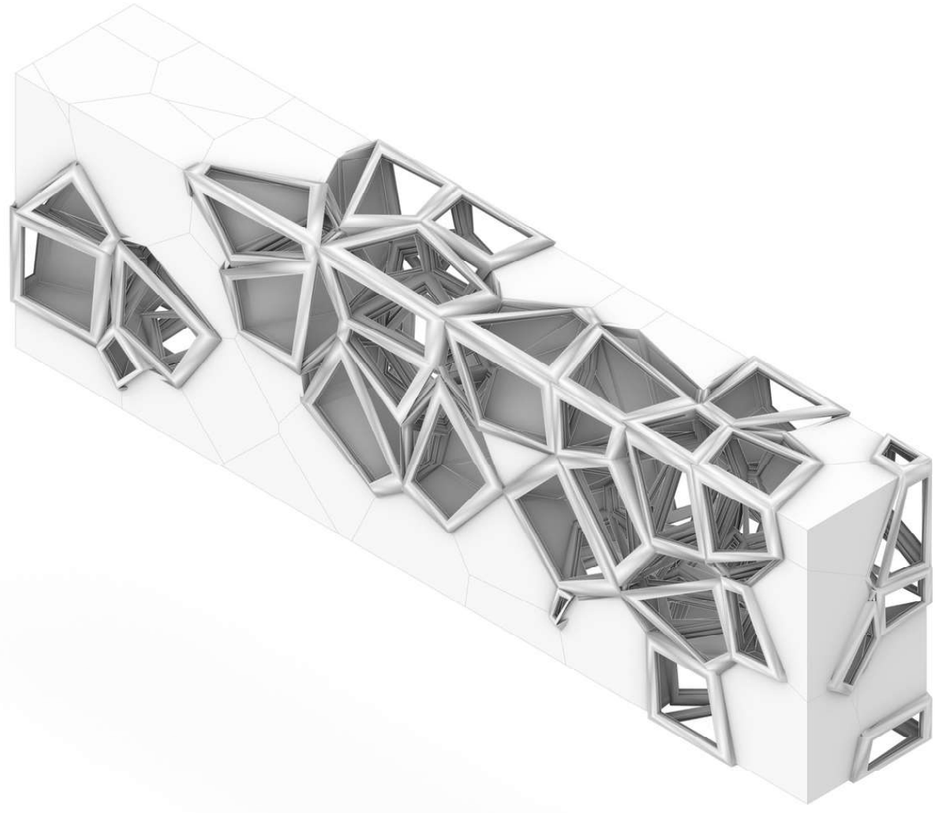
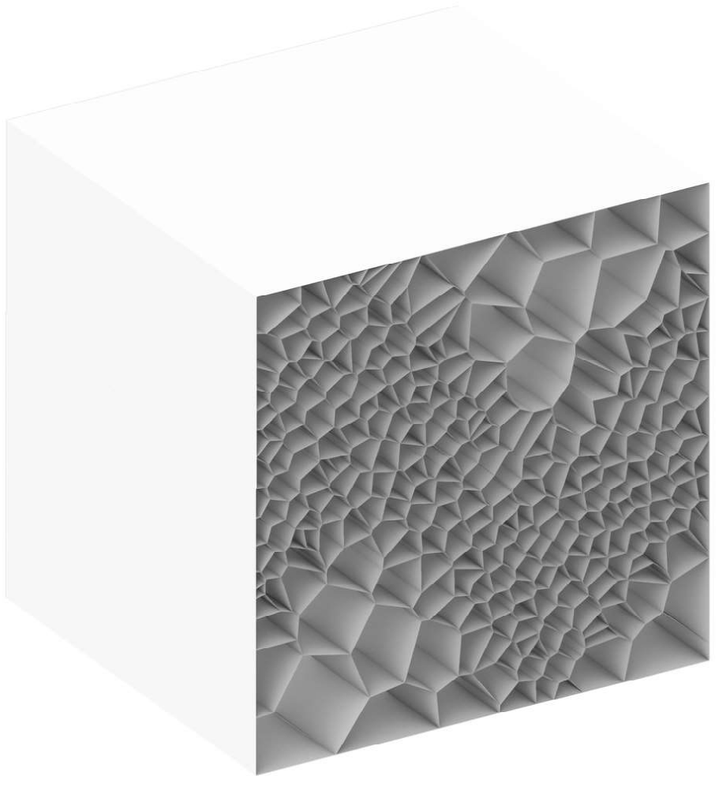
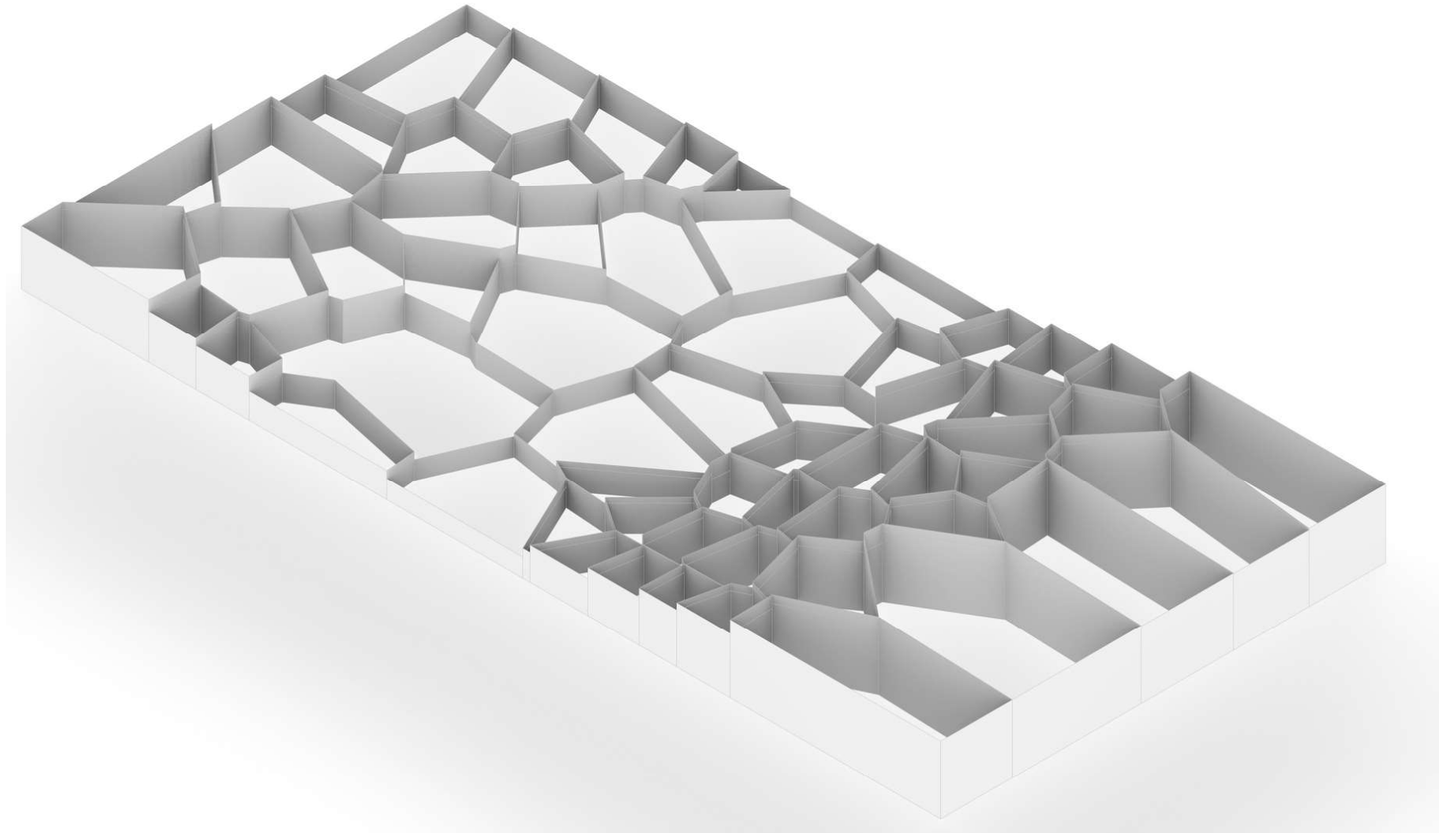
FRAGMENT

early stages &
exploration

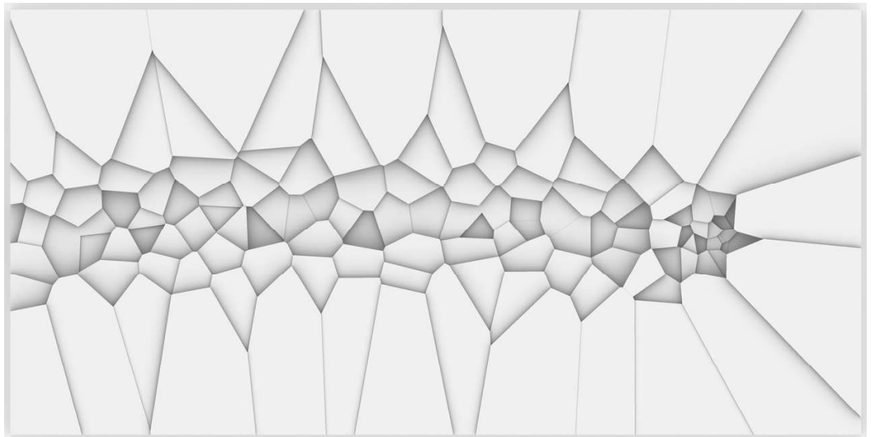


VORONOI SIZING & DEPTH

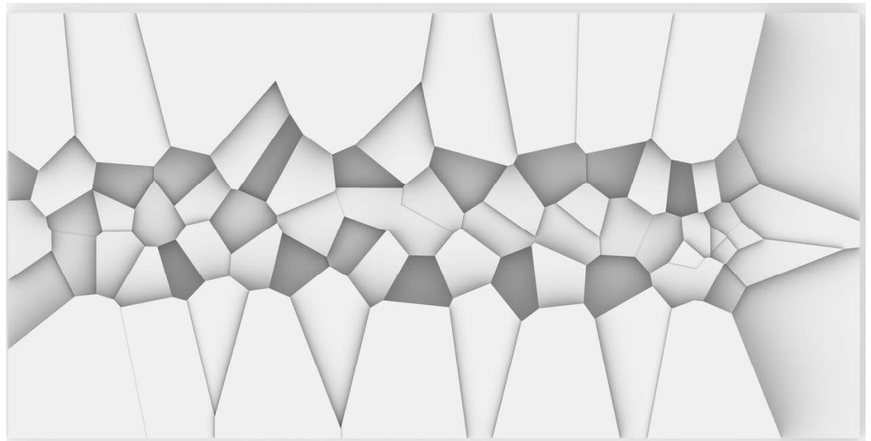




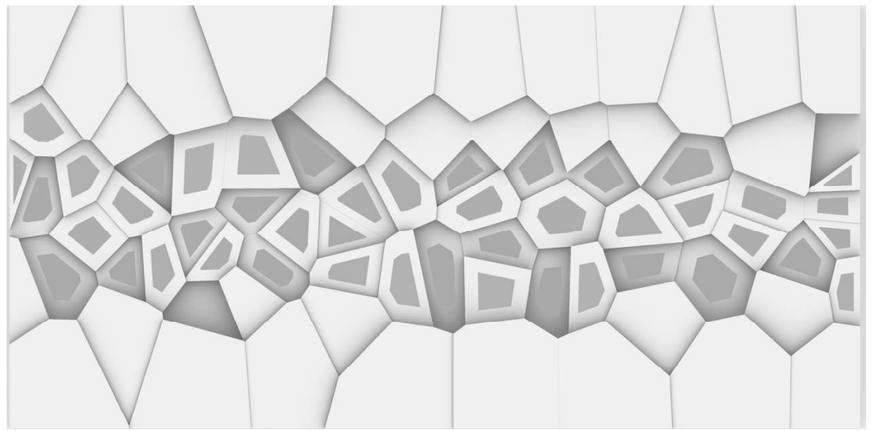
WALL APPLICATIONS & EXPERIMENTATIONS



DEPTH



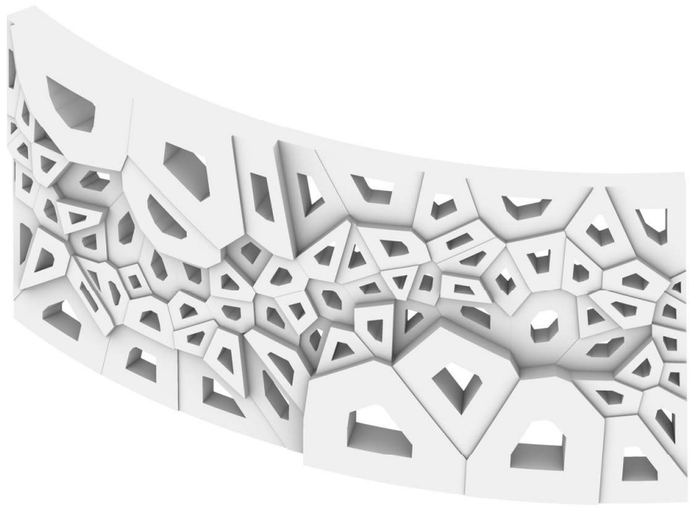
DEPTH & OPENINGS

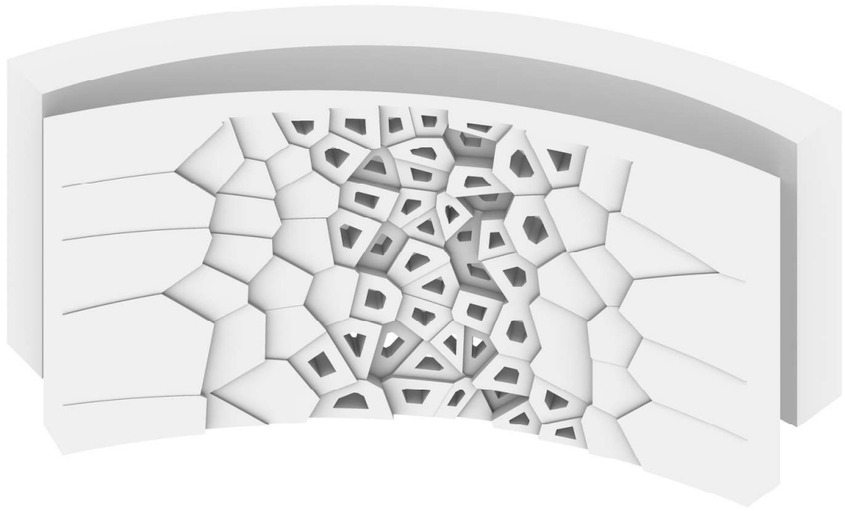


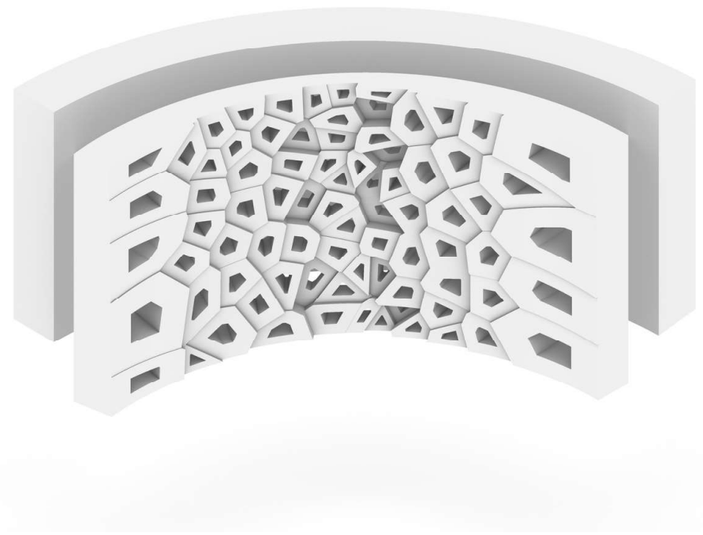
DEPTH & CELL OPENINGS

WALL APPLICATIONS & EXPERIMENTATIONS

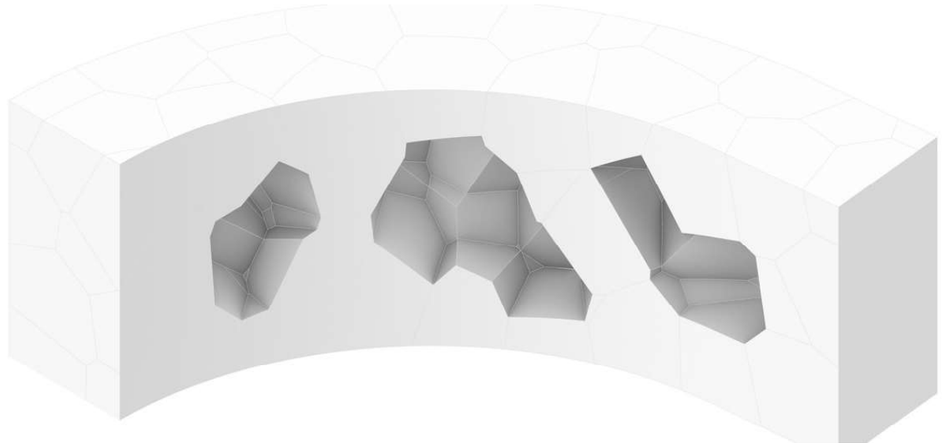
DEVELOPING WALL DESIGN CONCEPTS

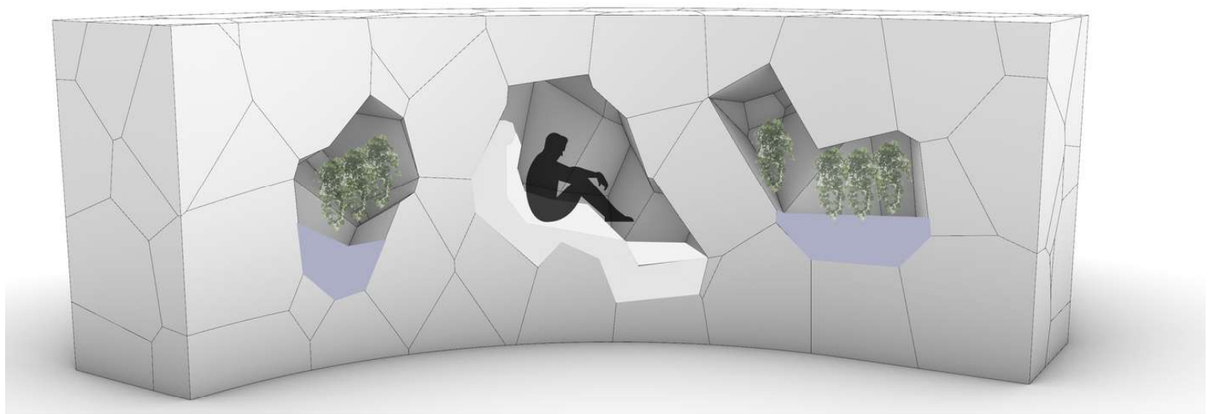


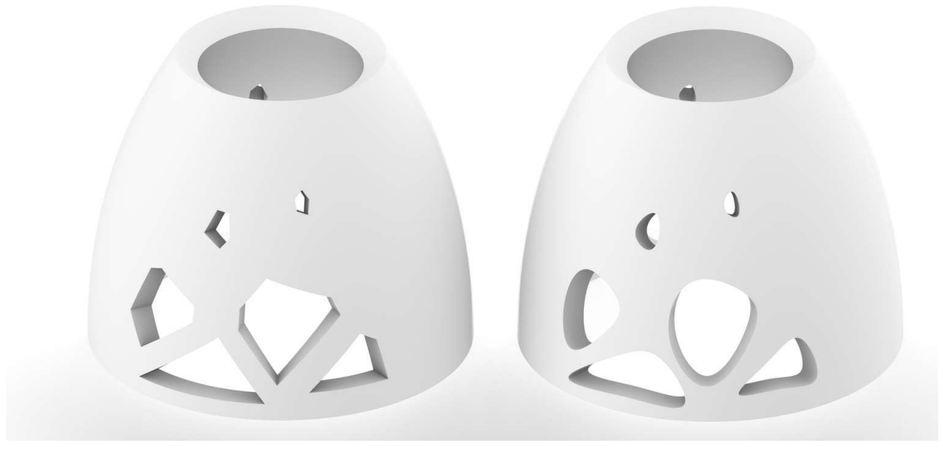




EXPLORING SPATIAL QUALITIES







FRAGMENT

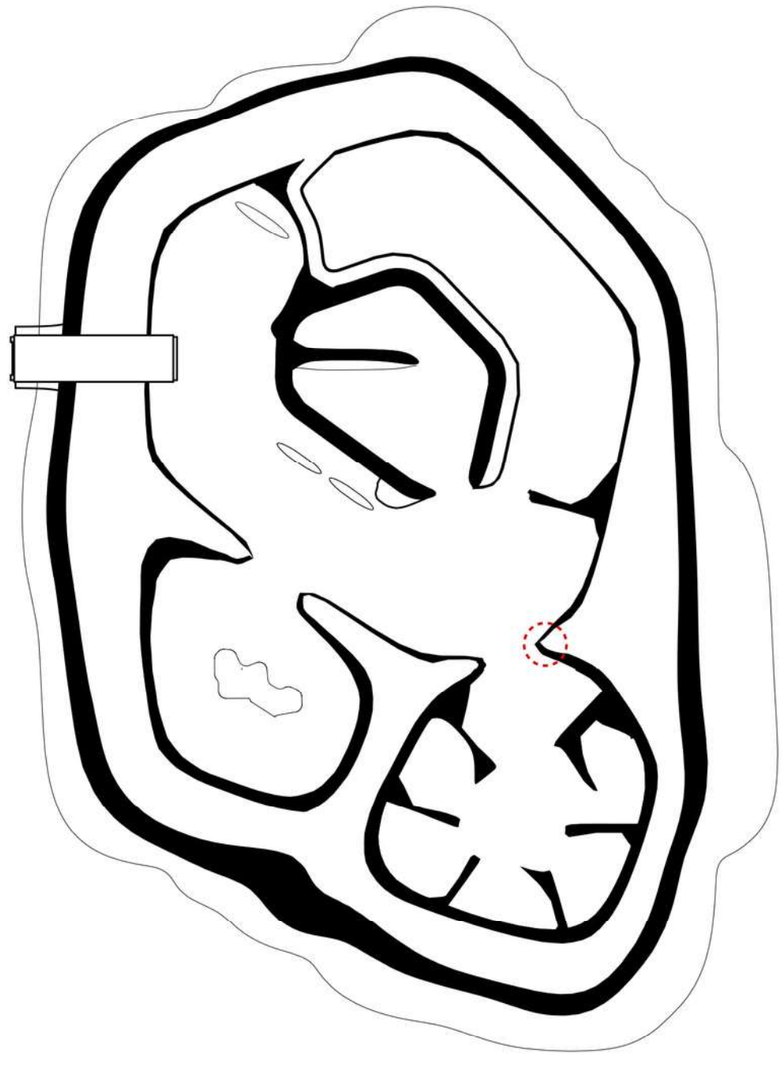
THE OPPORTUNITIES

Implemented

Explored

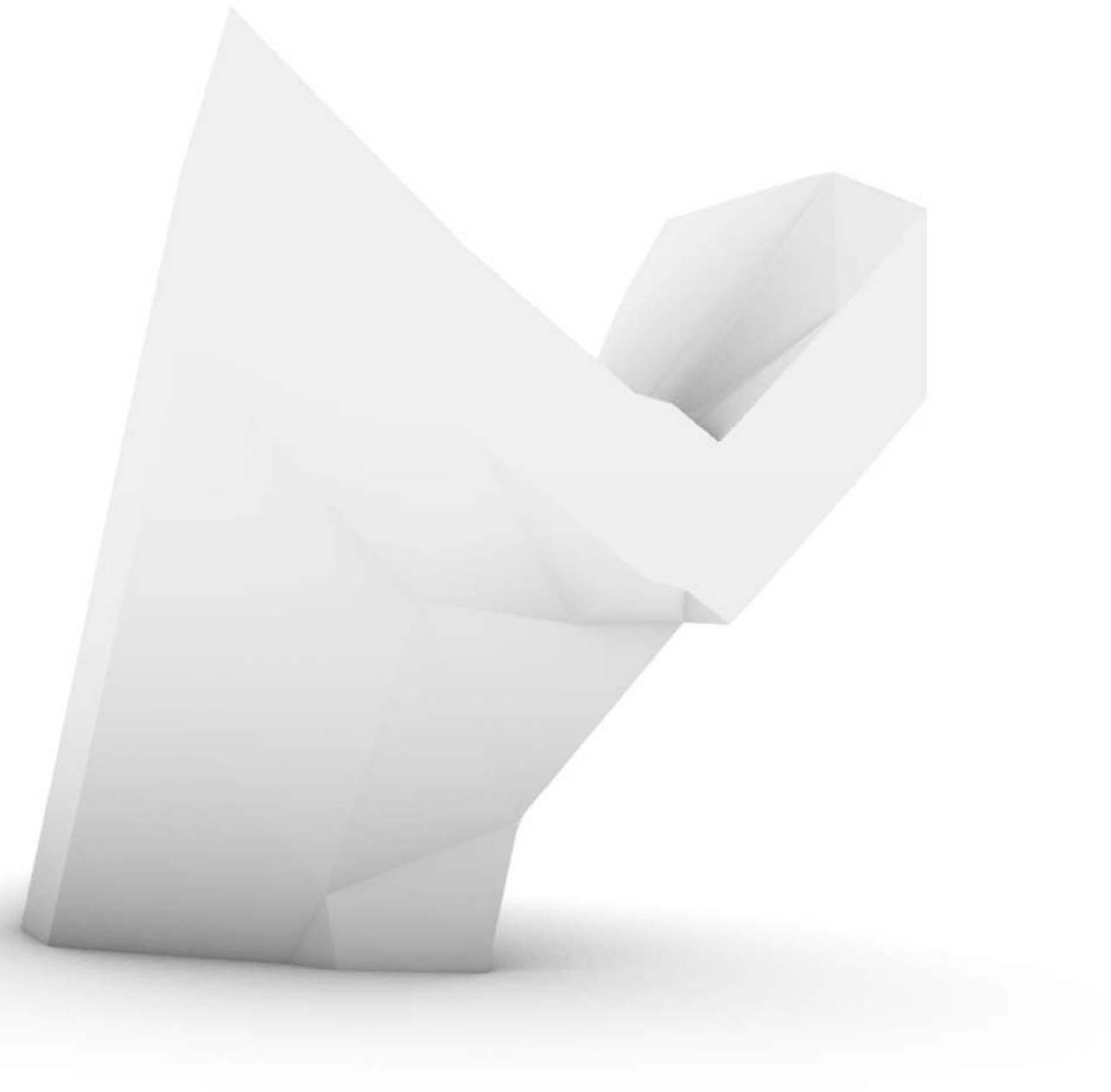
FRAGMENT

IT IS LOCATED AT AN
INTERSECTION OF TWO
CATENARY SHELLS TO SHOWCASE
THE WAY FORCE DISTRIBUTION OF
A COMPRESSIVE STRUCTURE
WORKS IN SUCH A SCENRIO



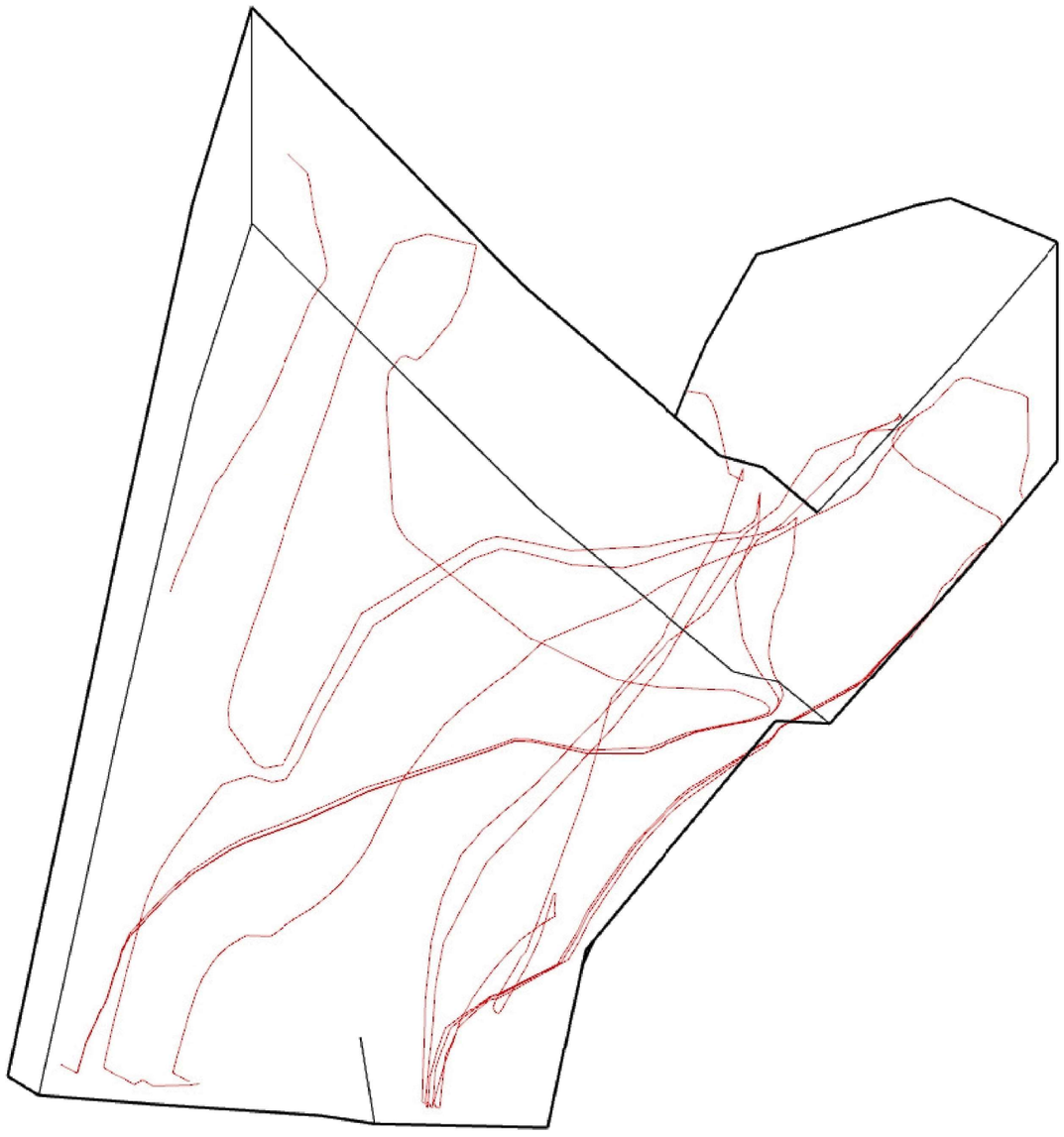
FRAGMENT

A FRAGMENT IS CHOSEN TO FURTHER ELABORATE THE STRUCTURAL CONDITIONS AND ALLOWS ELABORATING ADDITIONAL ELEMENTS ON A SMALLER SCALE

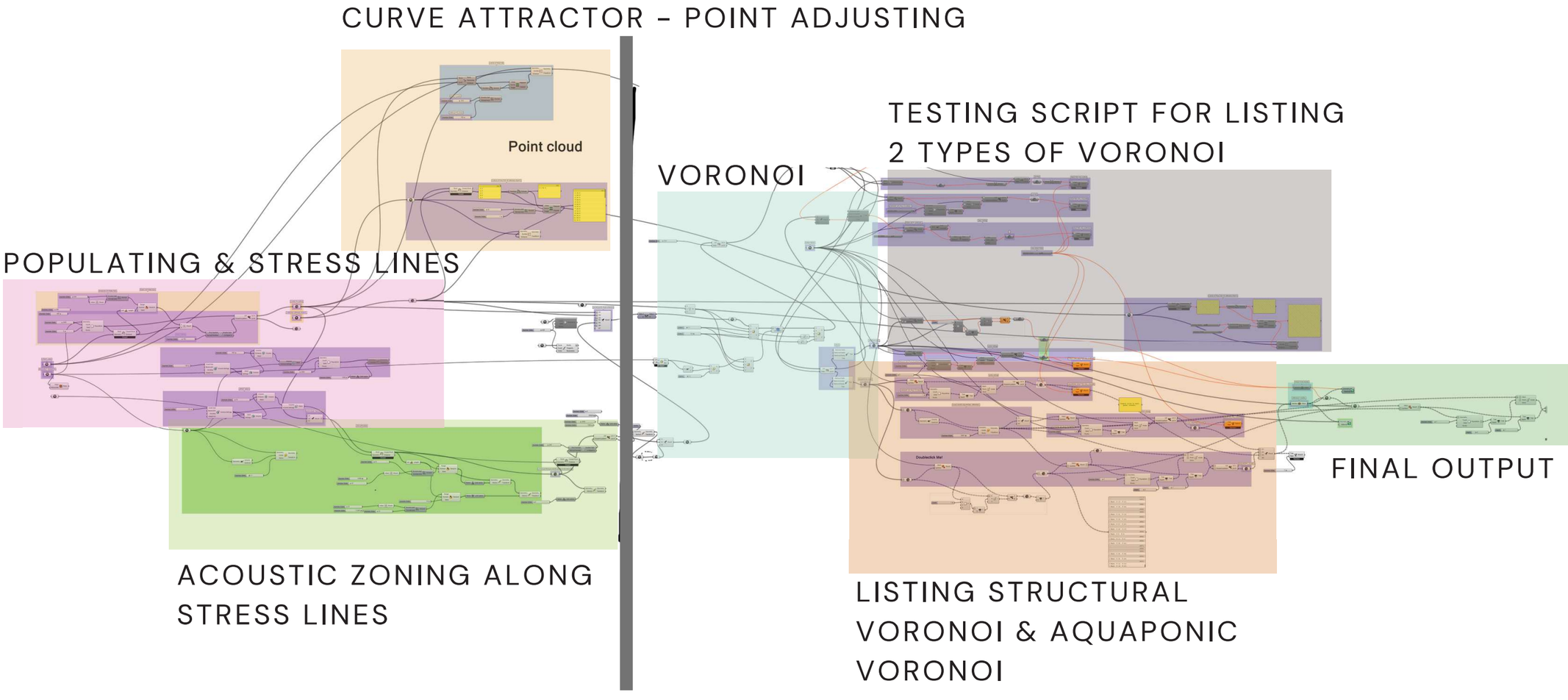


FORCE ANALYSIS

PICKING AN INTERSECTION OF A SEPARATION OF TWO SPACES SHOWCASES THE OVERLAY OF FORCES WORKING IN COMPRESSION COMING FROM THE PRINCIPLE OF A FLIPPED CATENARY



THE SCRIPT

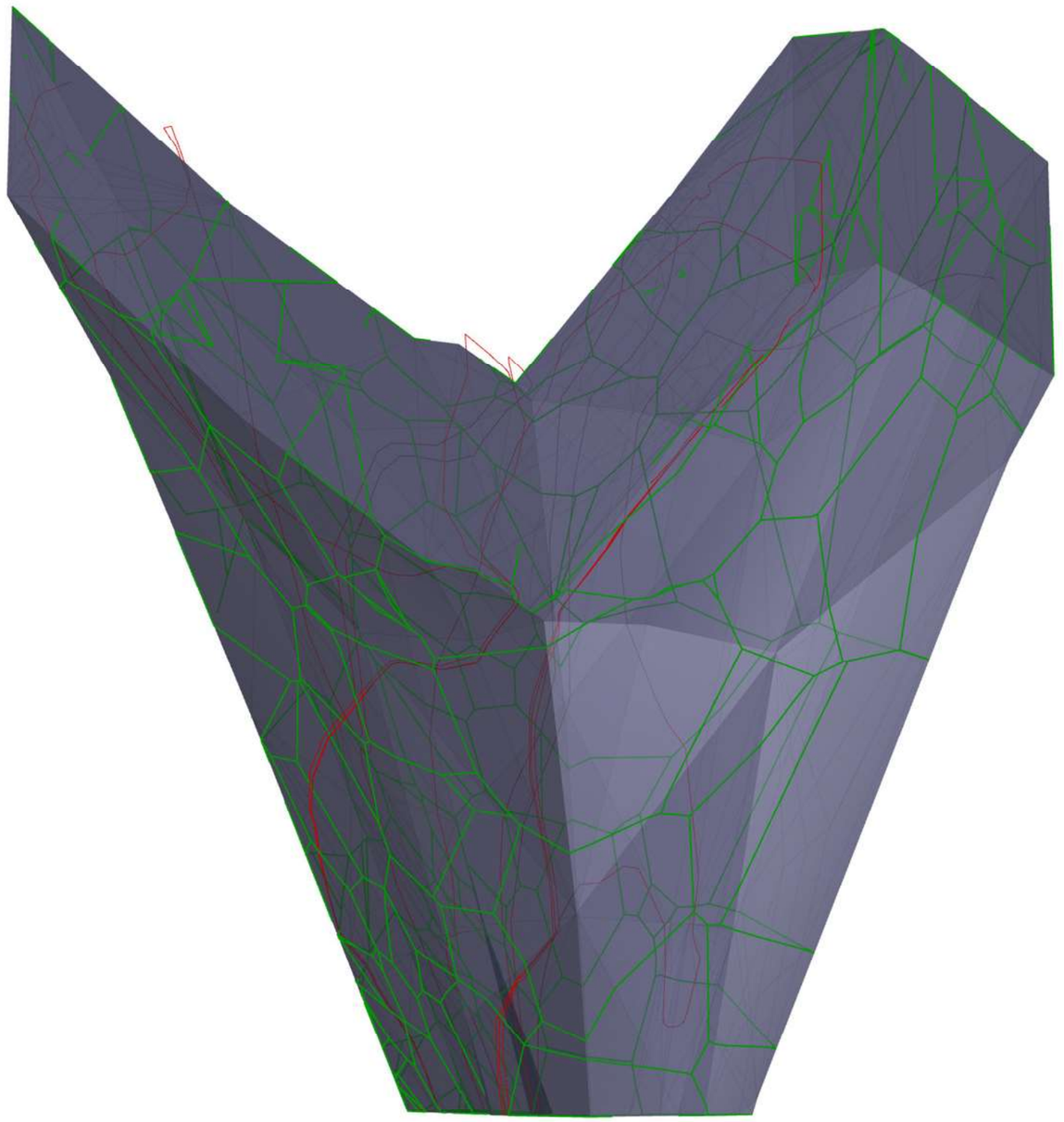


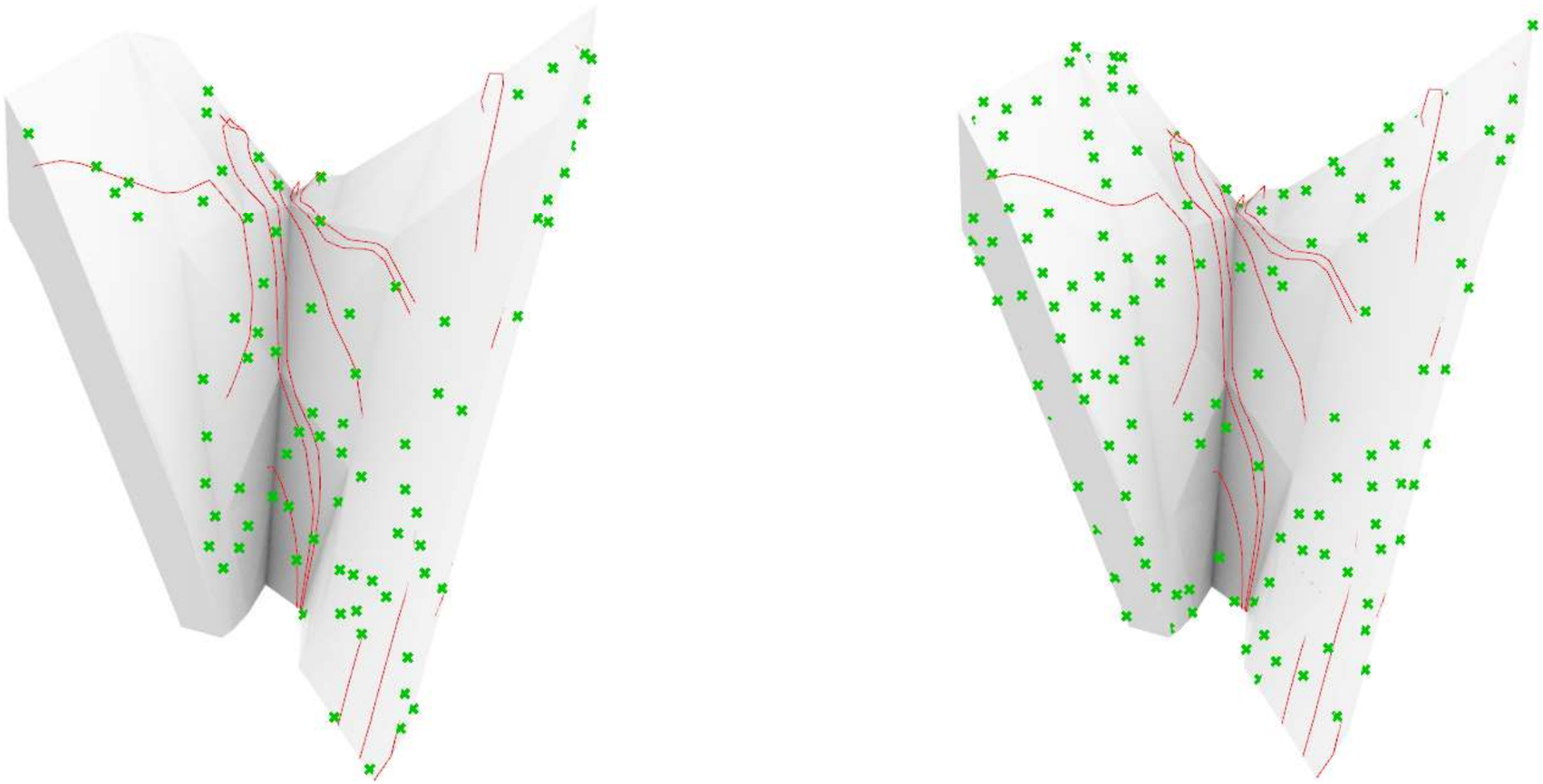
POINT ADJUSTMENT, ZONING, OVERALL DESIGN INPUT

CREATING VORONOI, MESH SPLIT FOR OPENINGS, VORONOI TYPES & THEIR OUTPUT

VORONOI ZONING

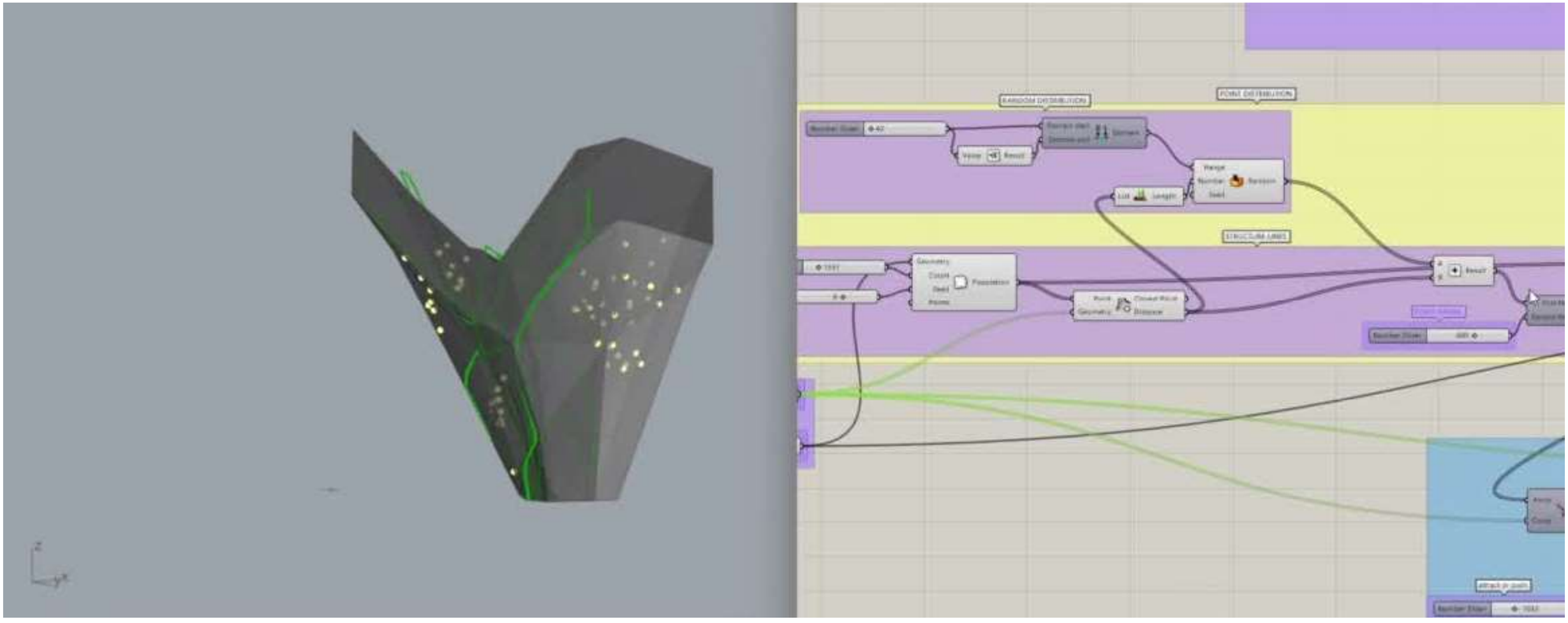
Using curve attractor to zone voronoi. The distance between the cells are adjustable and go along the stresslines.



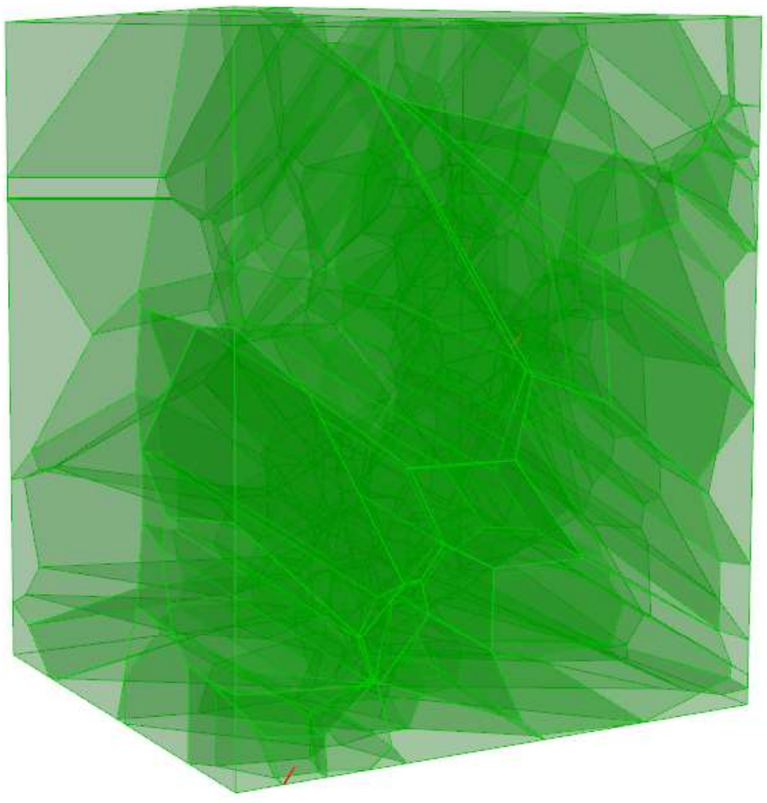


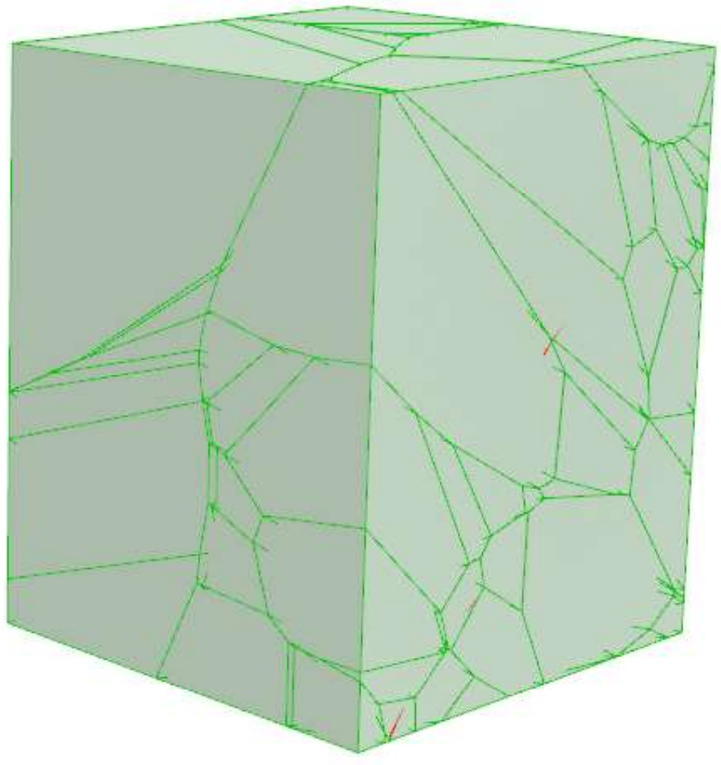
Selection of points close/away from the stress lines
Point randomness with 500 mm offset

POINTS ZONING

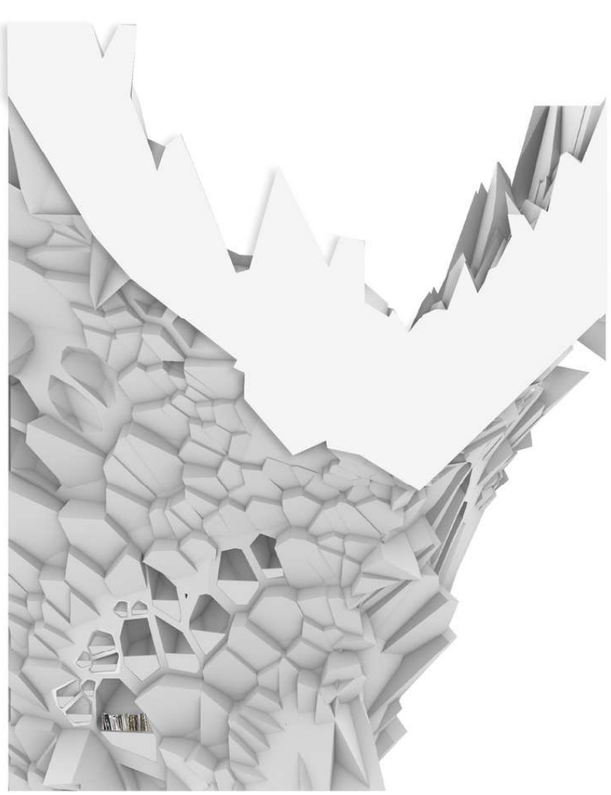


VORONOI SIZE VARIETY

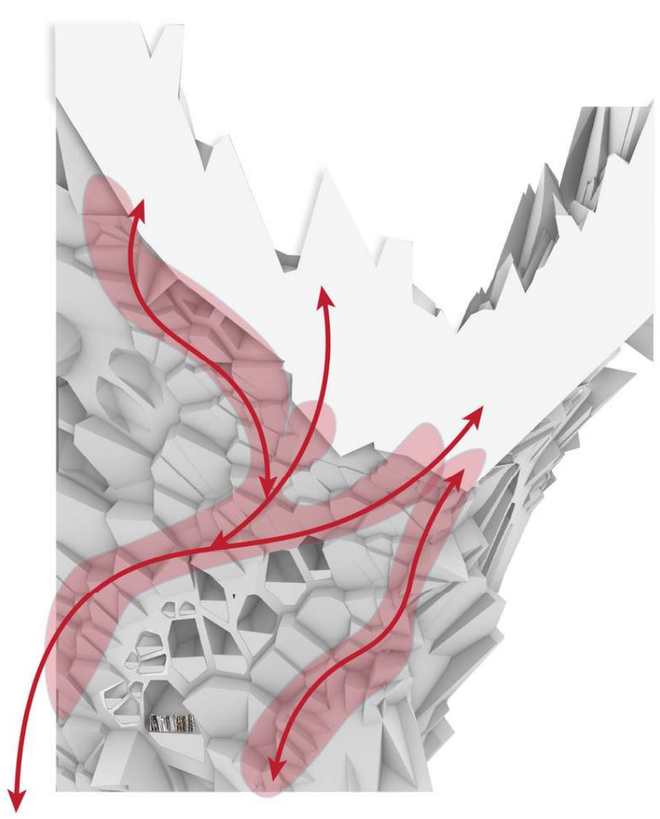


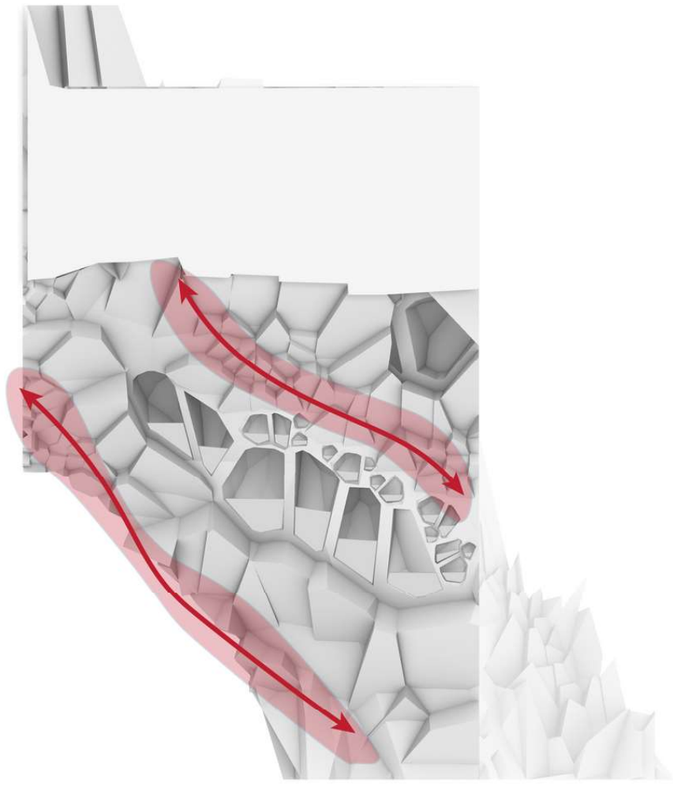


FINAL FRAGMENT DESIGN



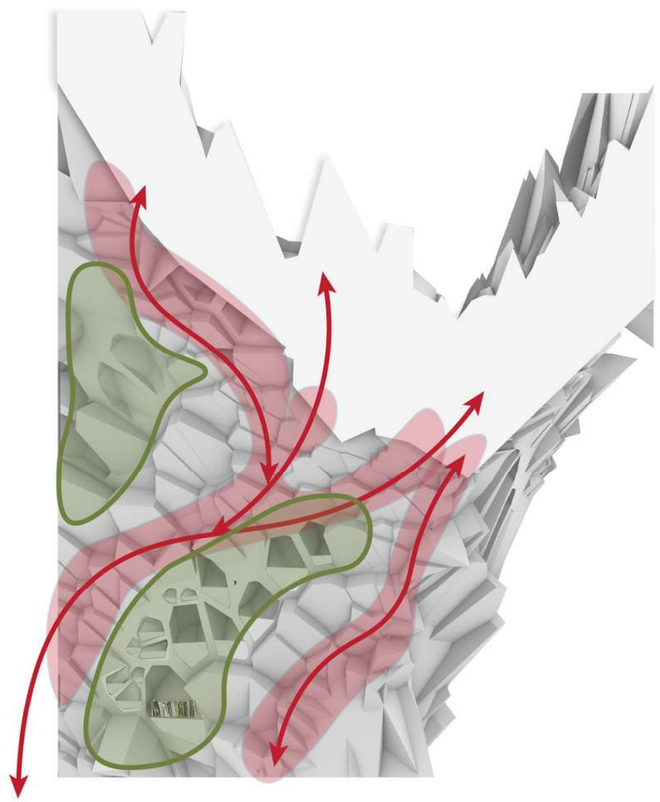
STRUCTURE





STRUCTURE

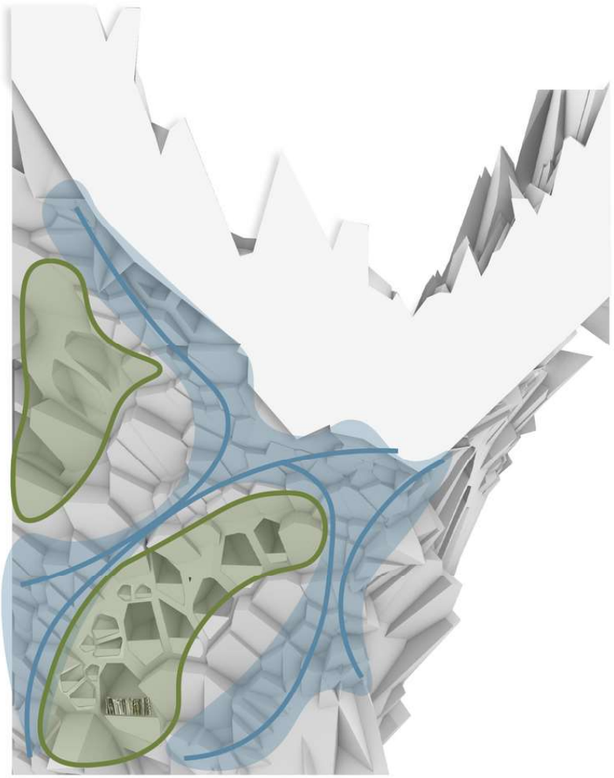
AQUAPONICS



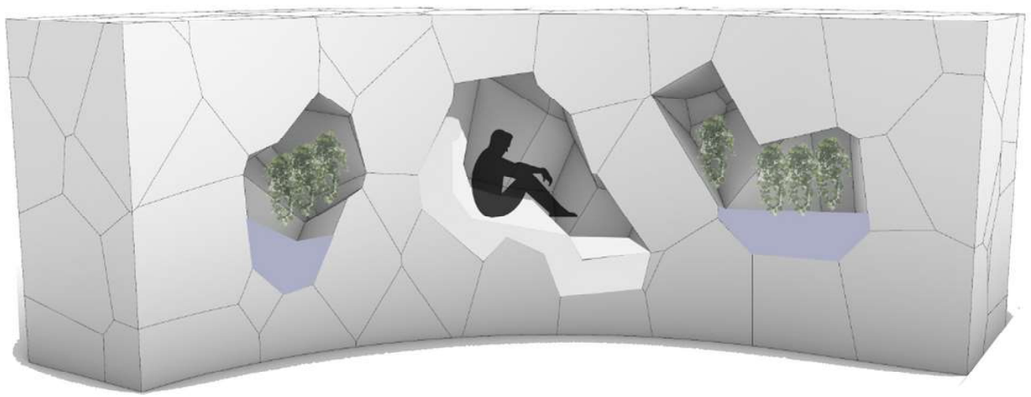
STRUCTURE

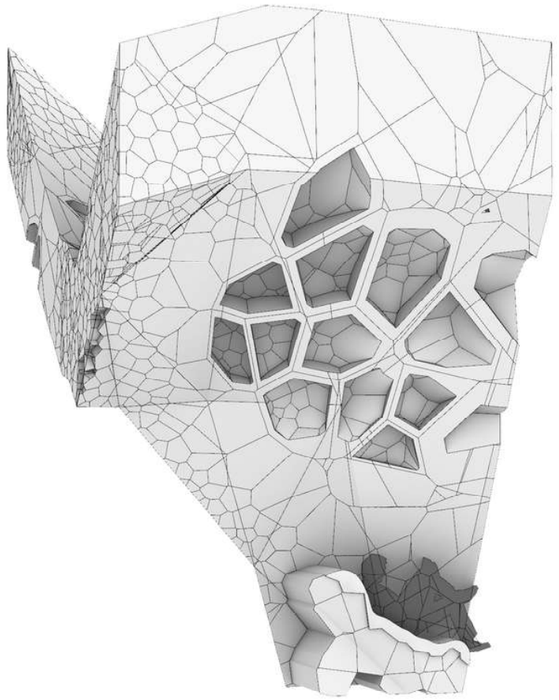
AQUAPONICS

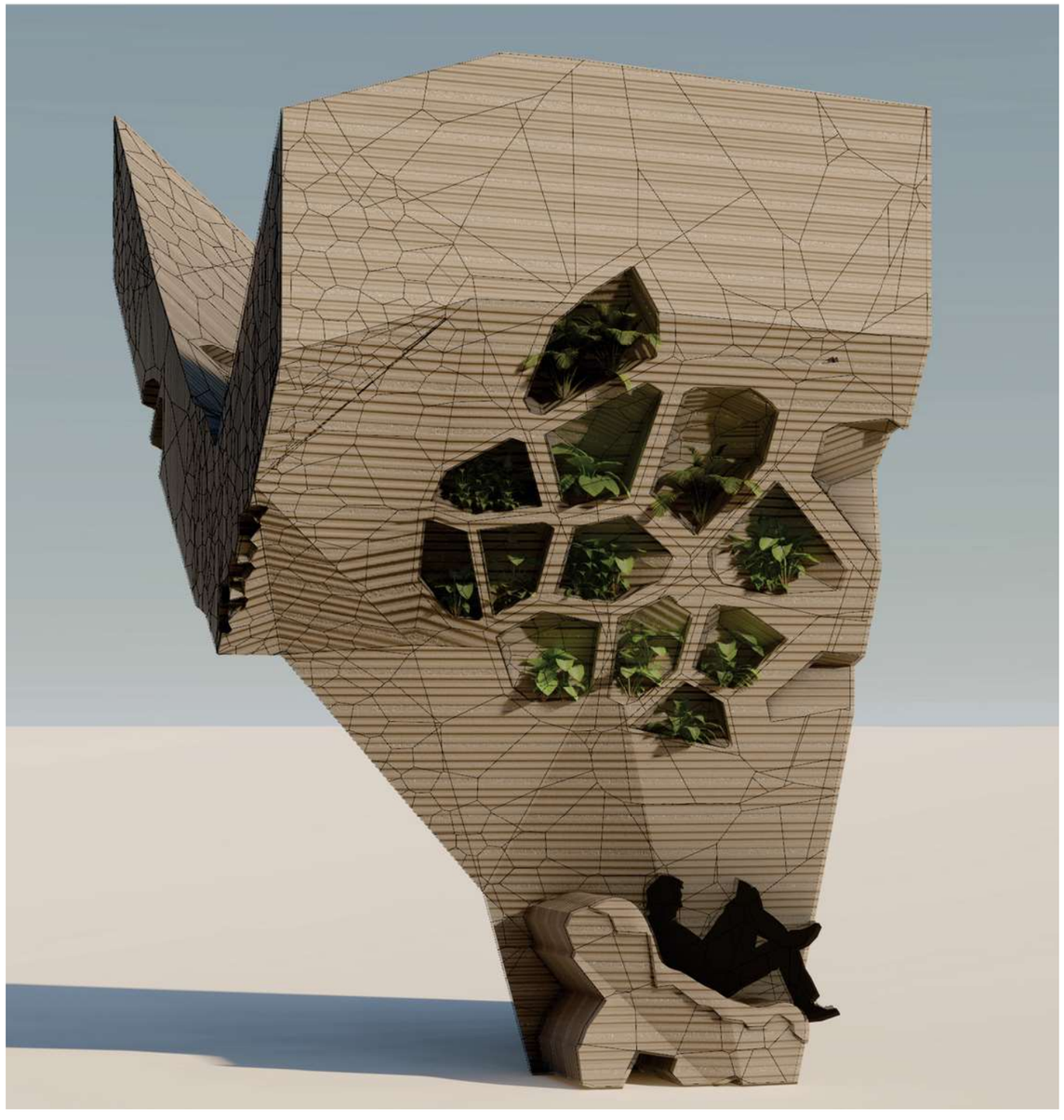
ACOUSTICS



FURNITURE

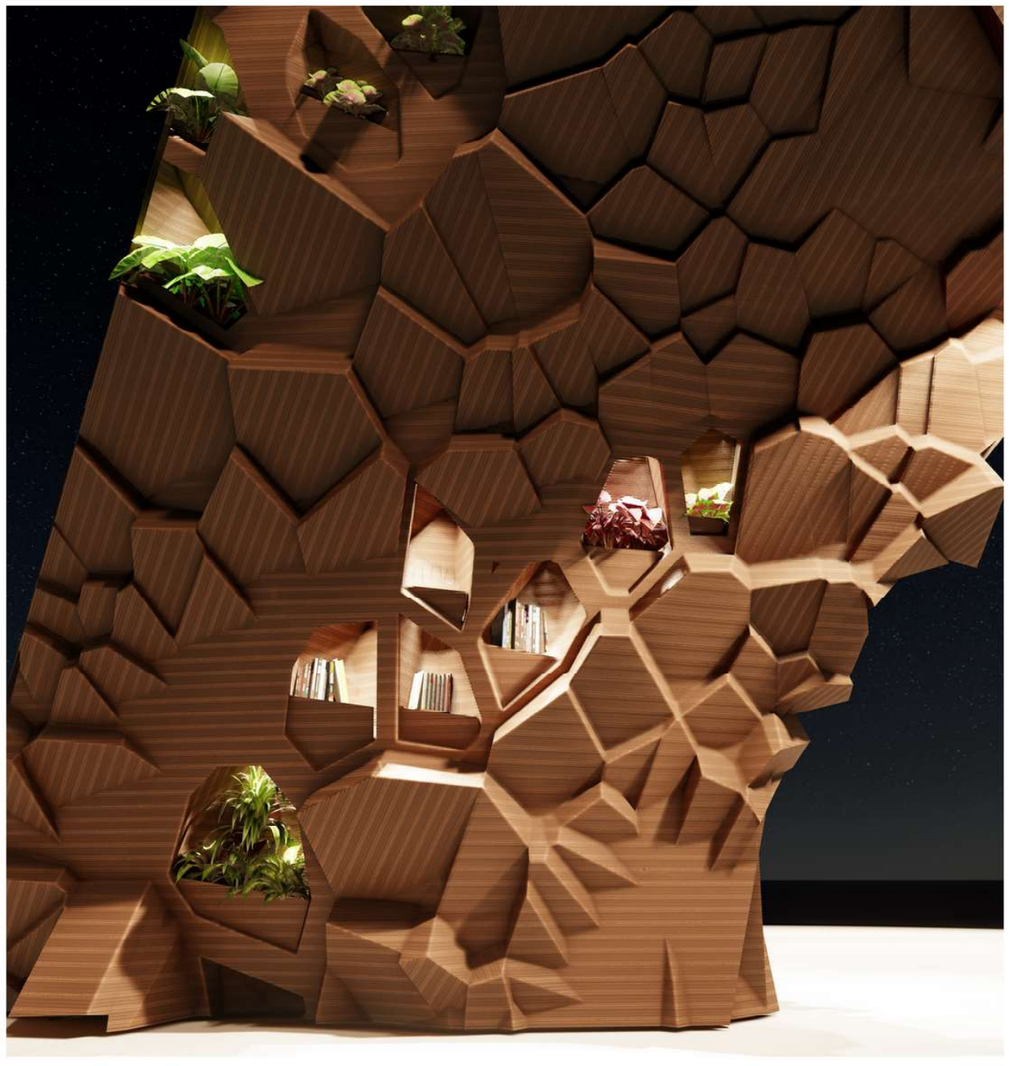






Seating Option

LIGHTING



Lighting integration & shelves

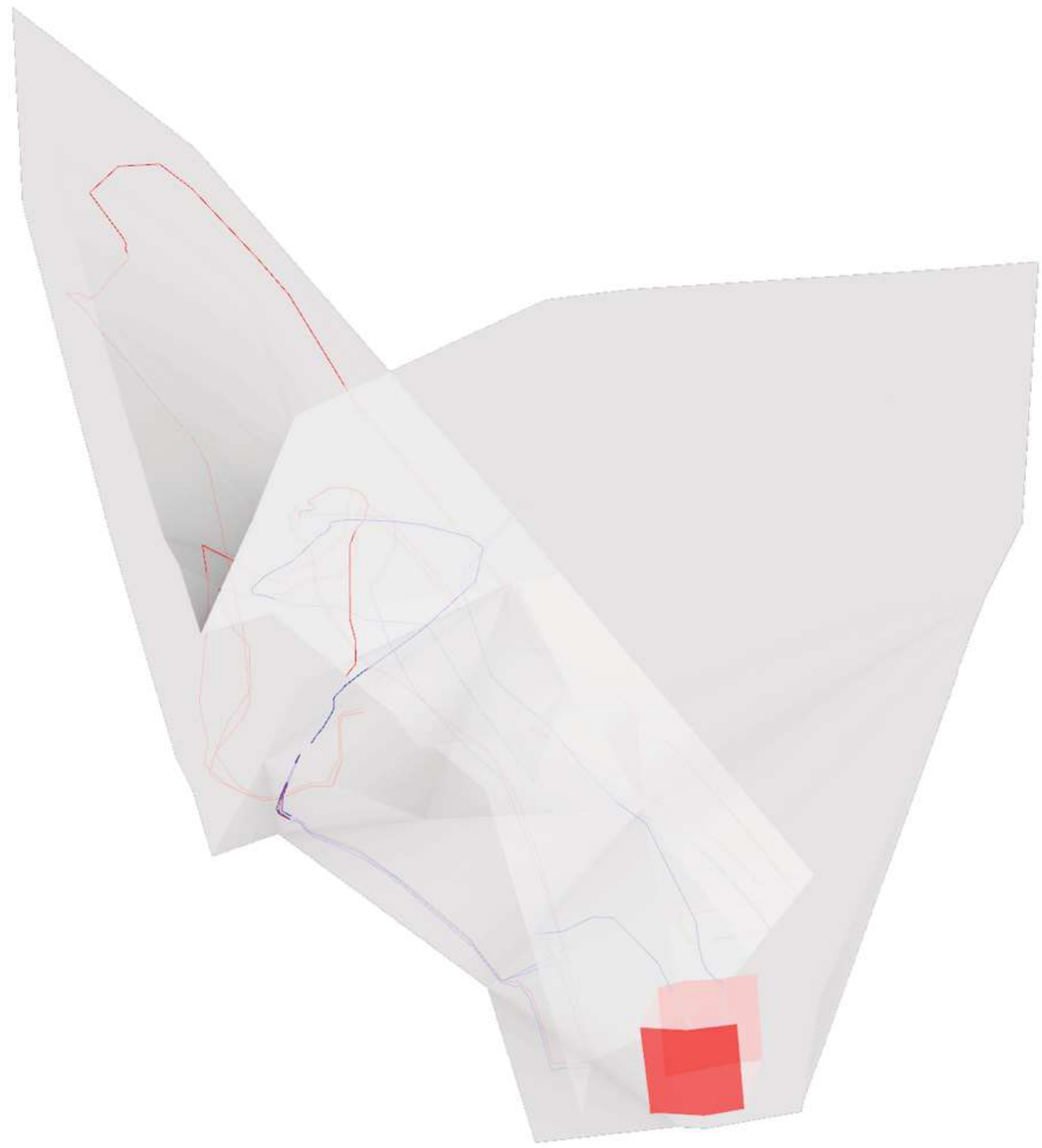
INCORPORATING LIFE SUPORT SYSTEMS

AQUAPONICS PRINCIPLE

1:1 FRAGMENT

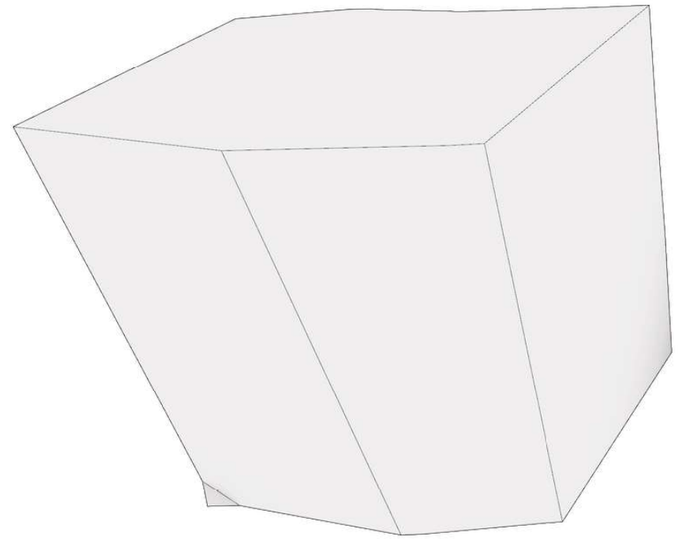
SELECTION

We choose a part of the fragment for the production of 1:1 prototype.



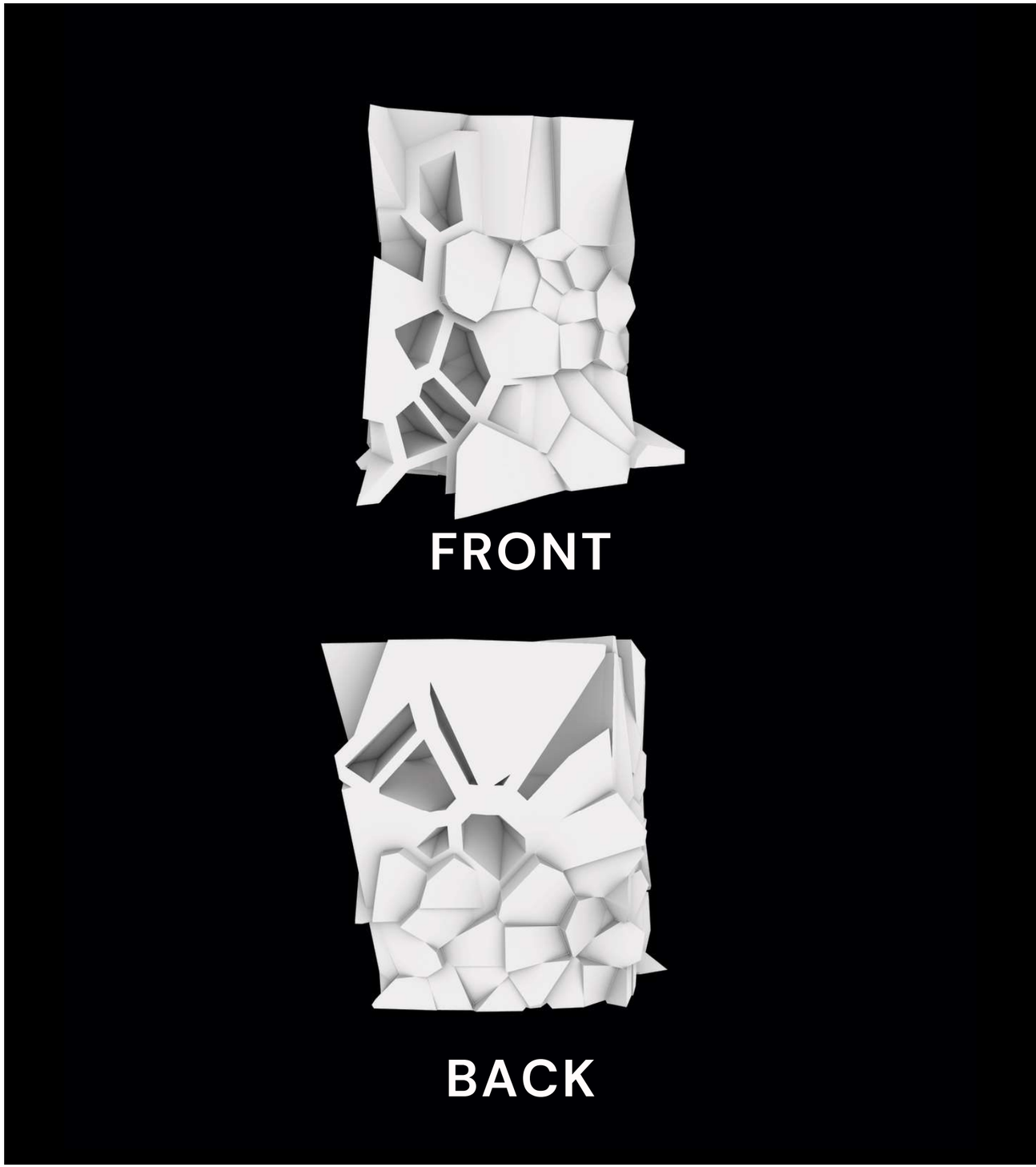
SELECTION

The following fragment has intreasting lean to it which allows to test the principle of leaning walls.

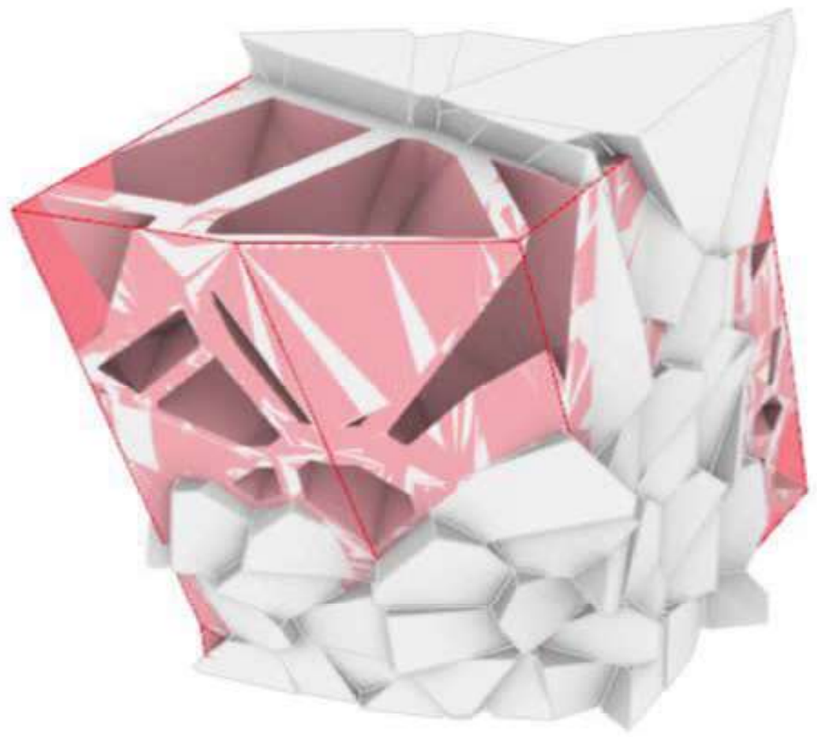


PROTOTYPE 1

First prototype create geometry hard to 3D print. The amount of aquaponics was also problematic as they overtook the geometry and hence eliminated acustics in some parts. Our aim of the exercise was to create a script that allows for a lot of control over the geometry - therefore we set goals and continued working. It preforms well compared to initial geometry.

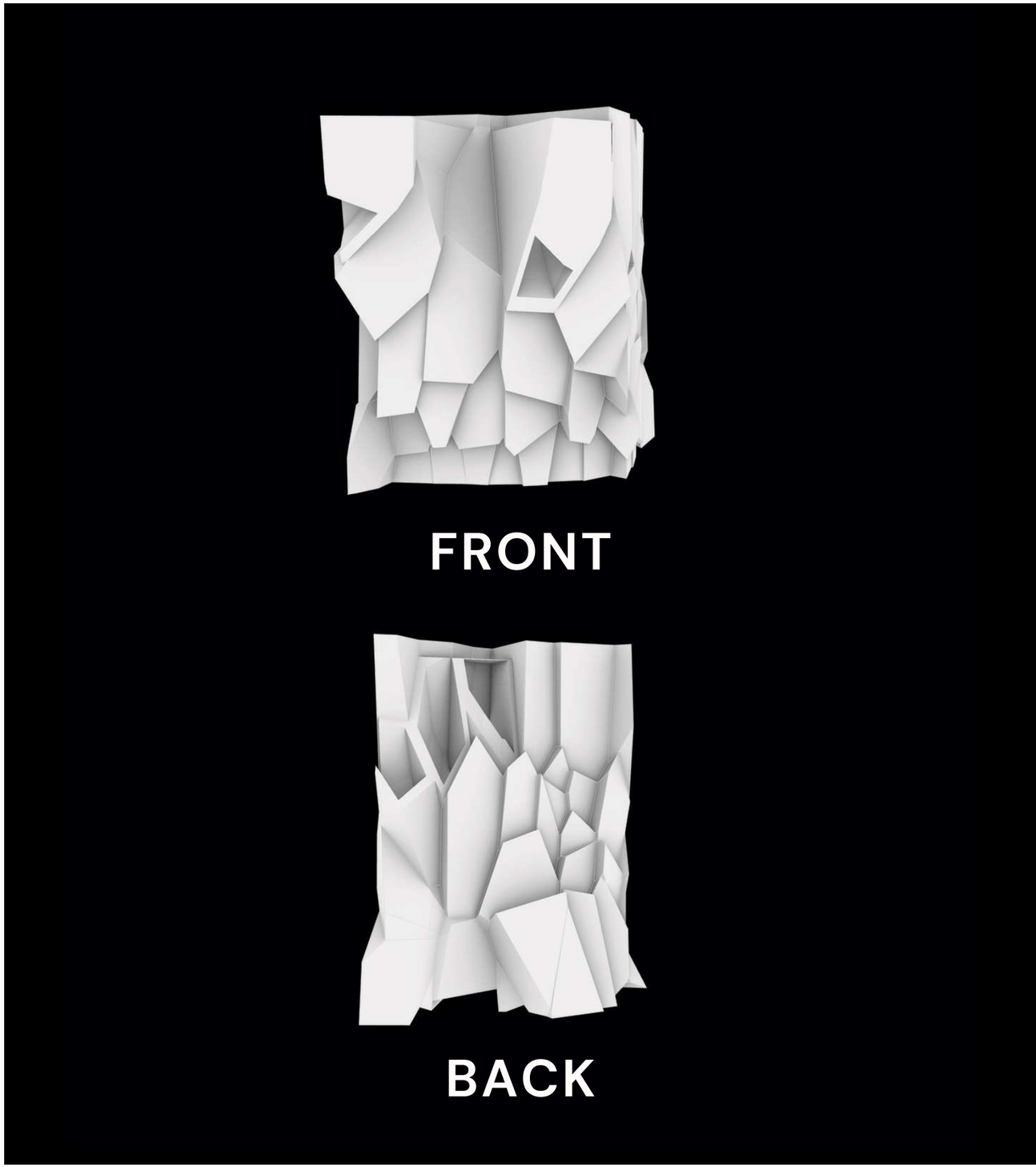


PROTOTYPE 1

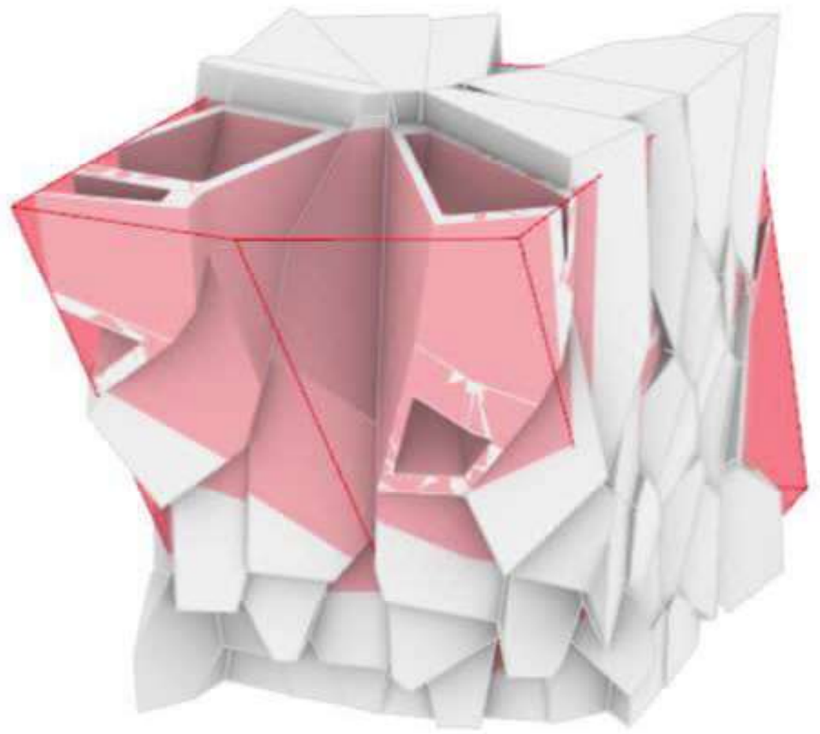


PROTOTYPE 2

The prototype creates the best aquaponics. However the front faces are unprintable as they hang in the air. This we had to change it. Also the smallest voronoi here are approximately 16cm where we aim for 4 cm. Thus we further improve.

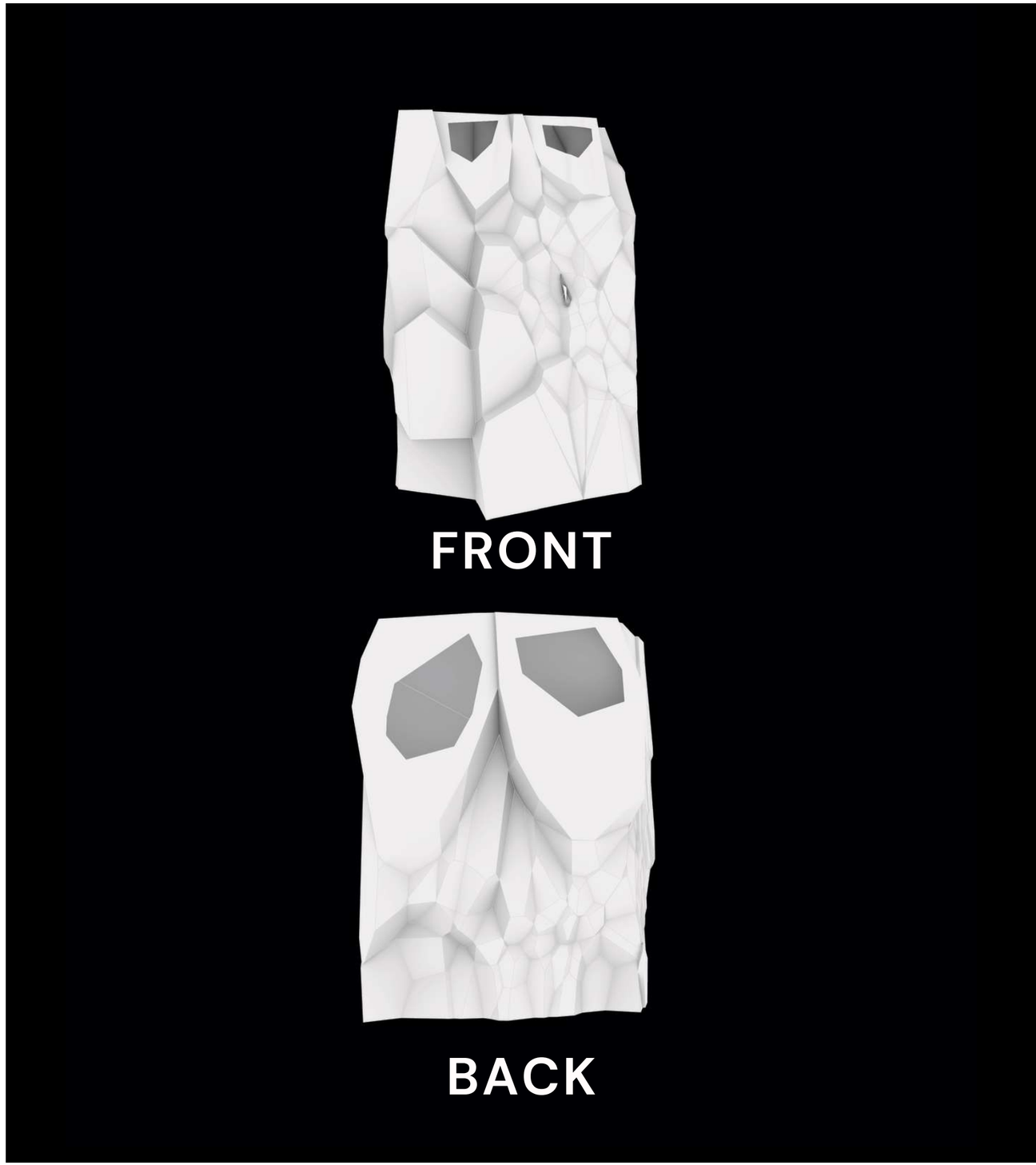


PROTOTYPE 2

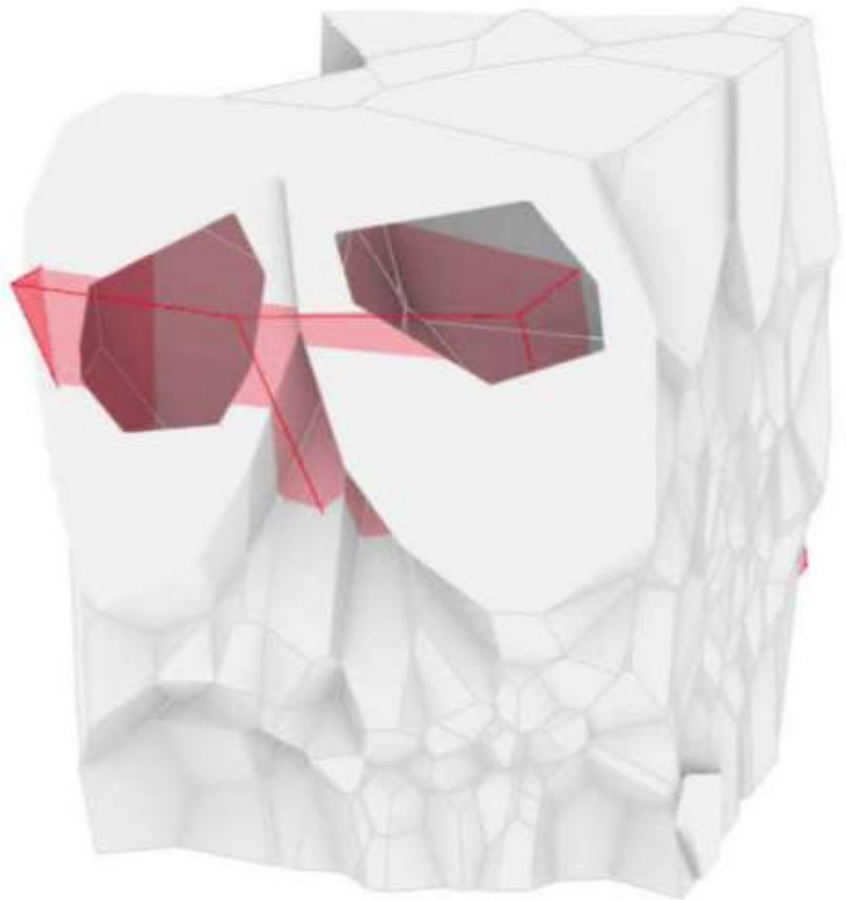


PROTOTYPE 3

We managed to get a selection of smaller voronoi. The geometry is also more printable. Yet, too much deviation from the initial shape happens therefore it has to be fixed.

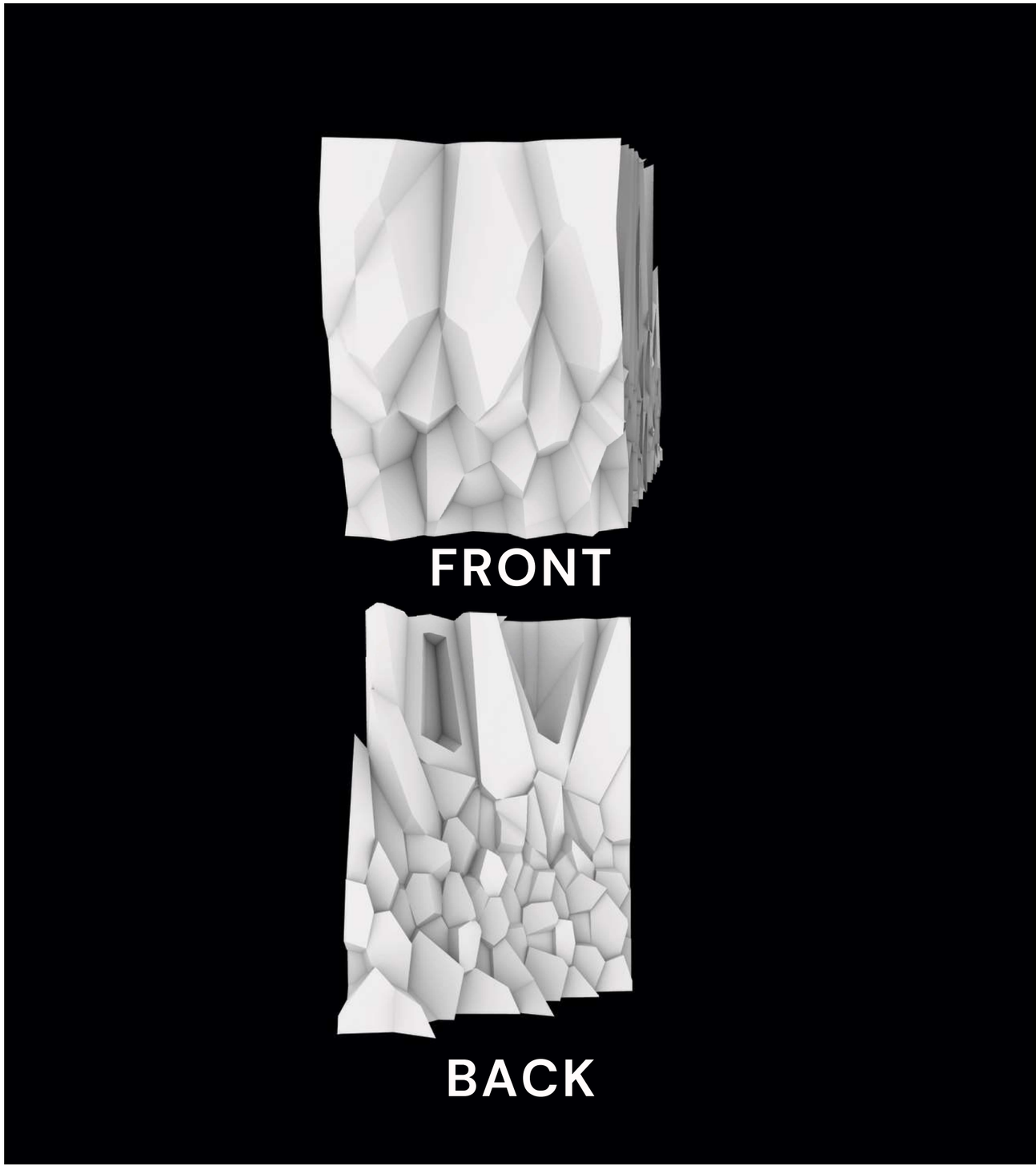


PROTOTYPE 3

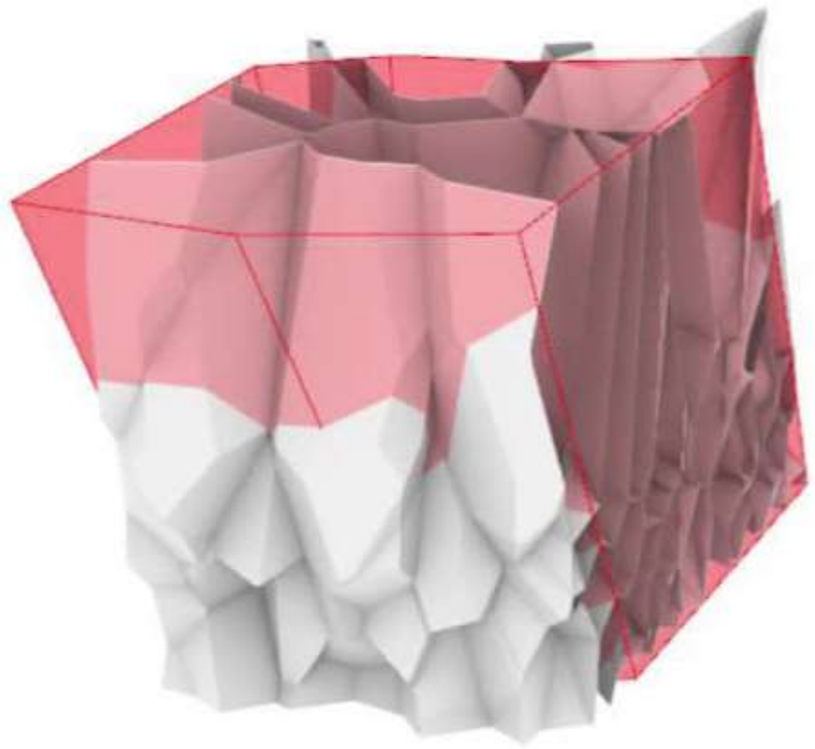


PROTOTYPE 4

Almost perfect geometry but there is significant deviation from the initial shape at the front top part. The back is precisely what we wanted. That is a lot of small voronoi, two aquaponics and gradient from the stress lines.

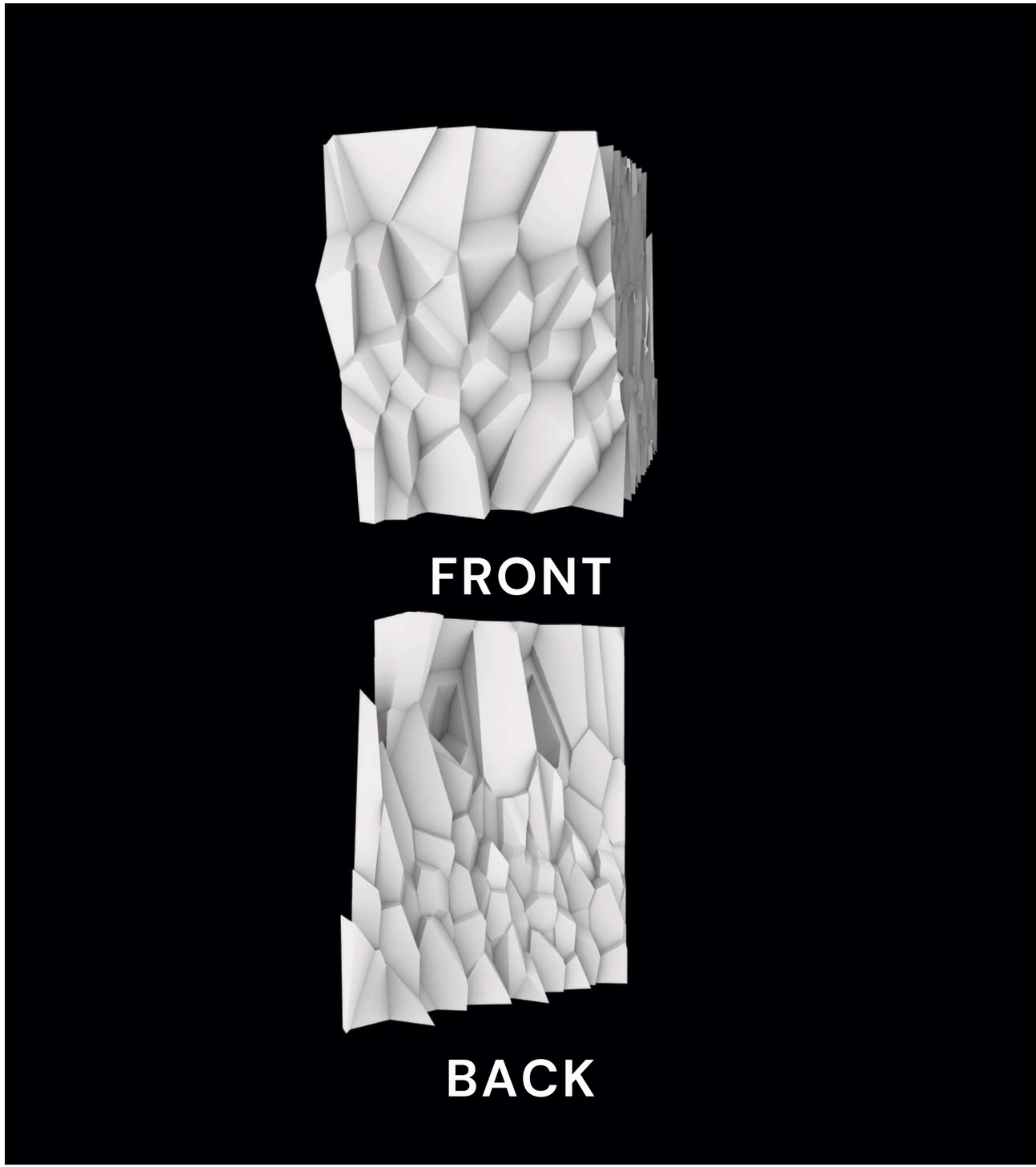


PROTOTYPE 4

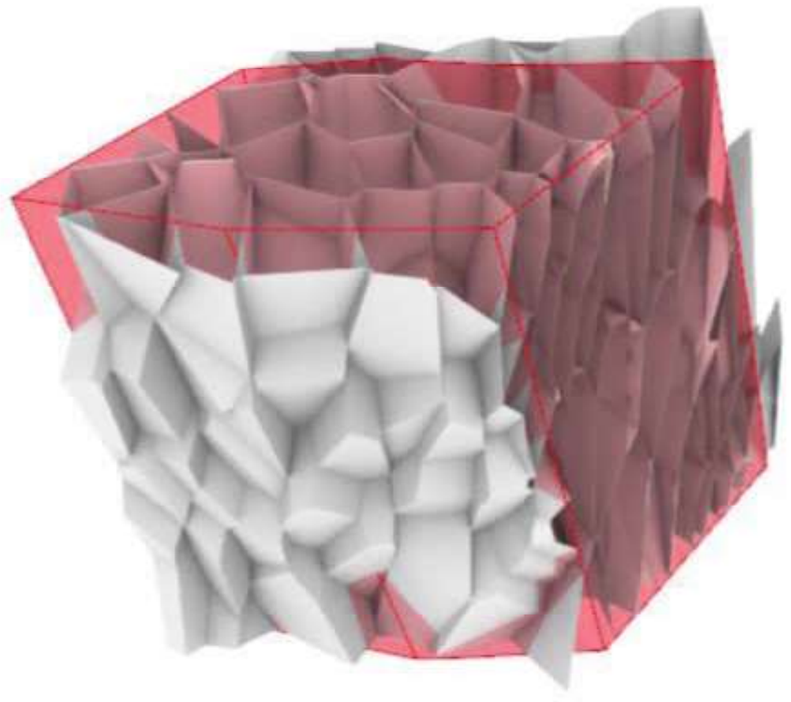


PROTOTYPE 5

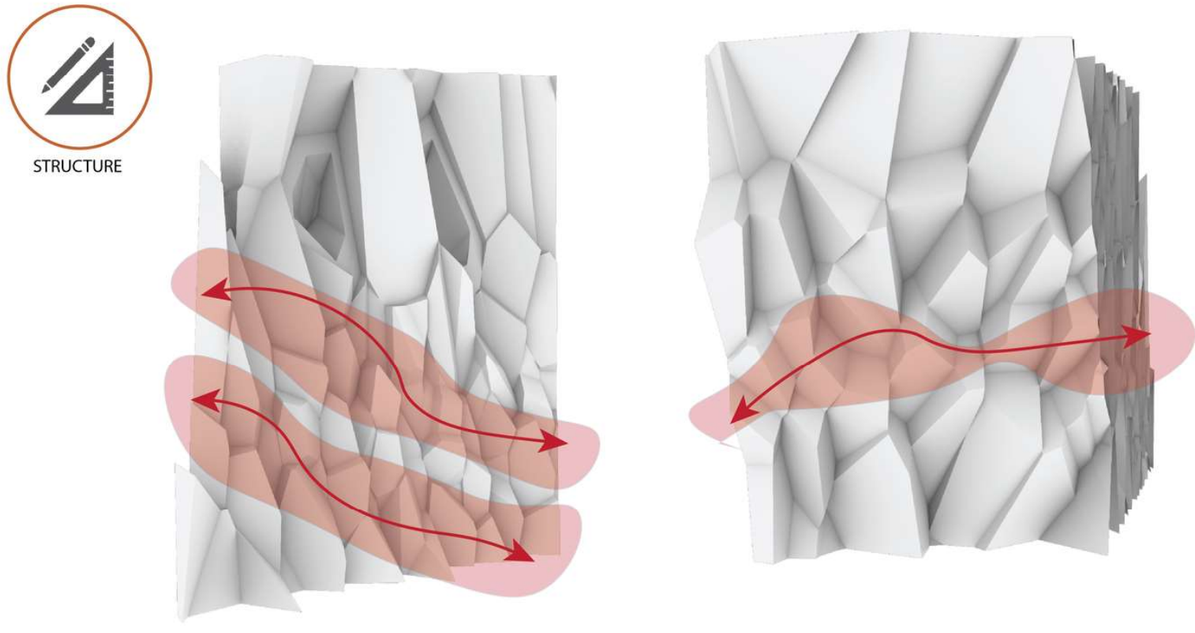
We are very proud of this fragment. We were able to achieve it with little manual adjustments. The front texture is also printable and it has been fixed at the script level which means that the principle is scalable and can be applied on other fragments too.



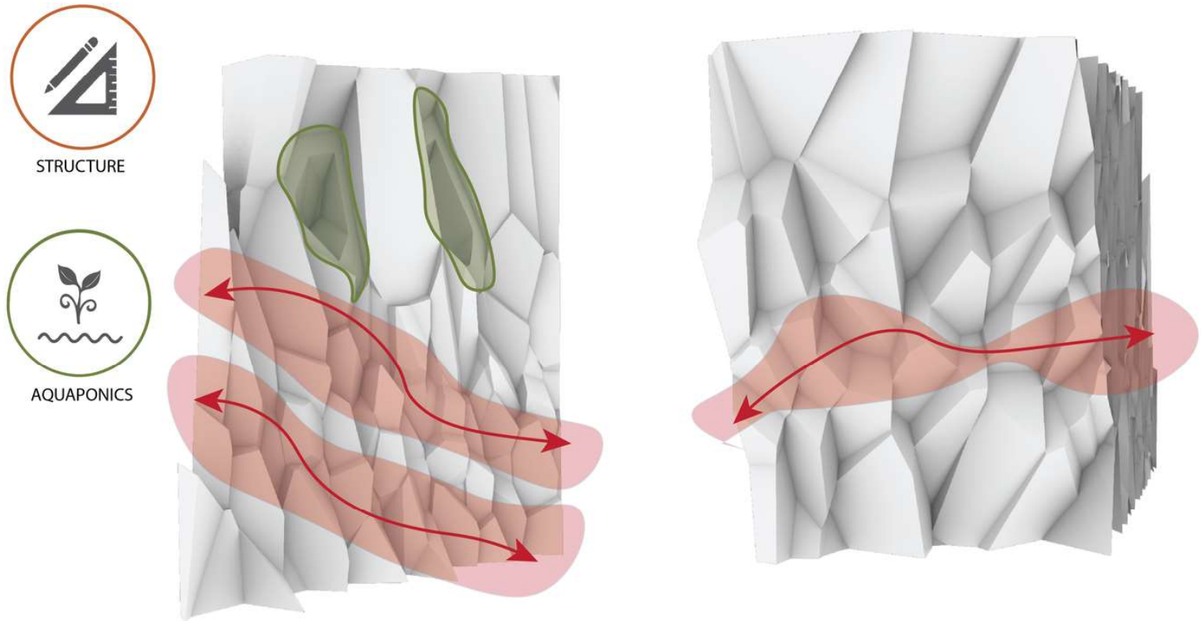
PROTOTYPE 5



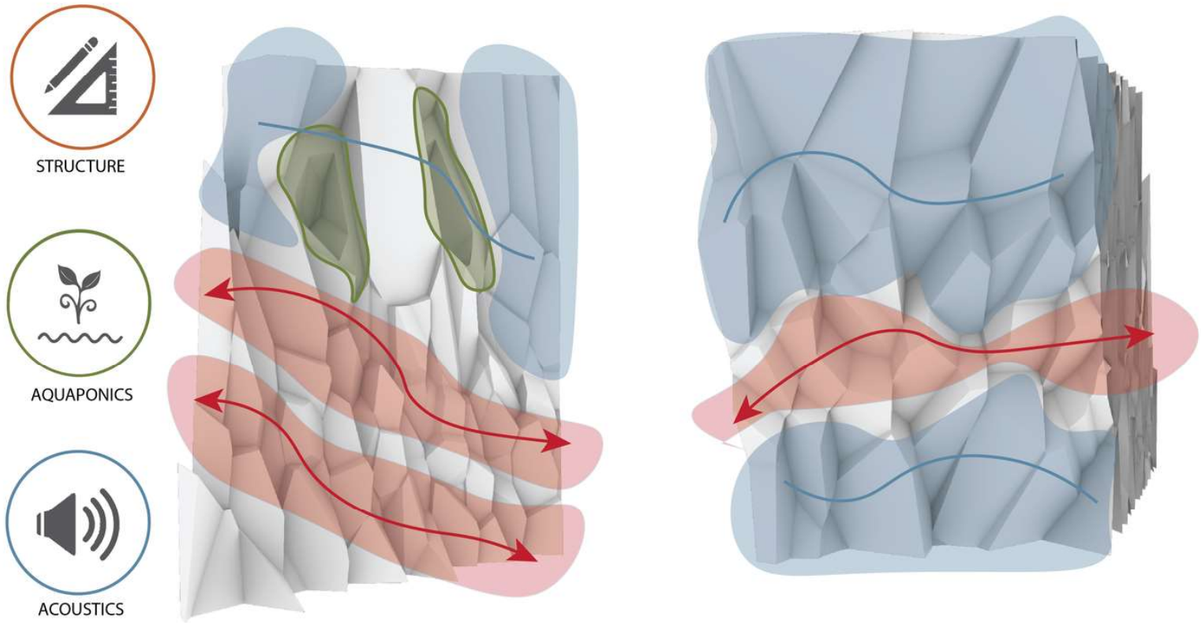
STRUCTURE

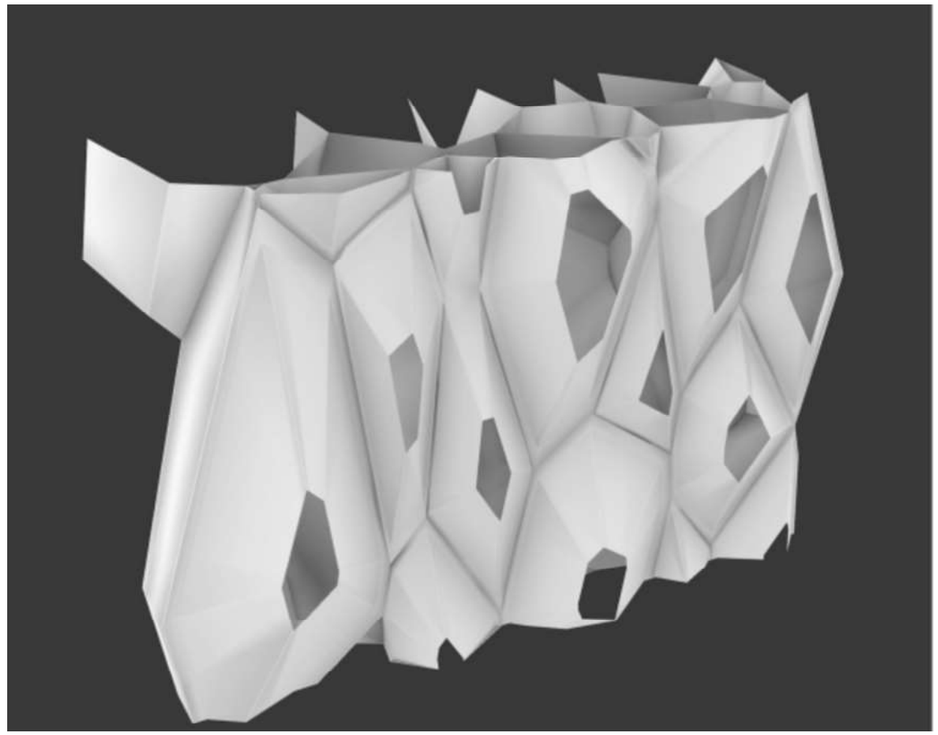


AQUAPONICS



ACUSTICS

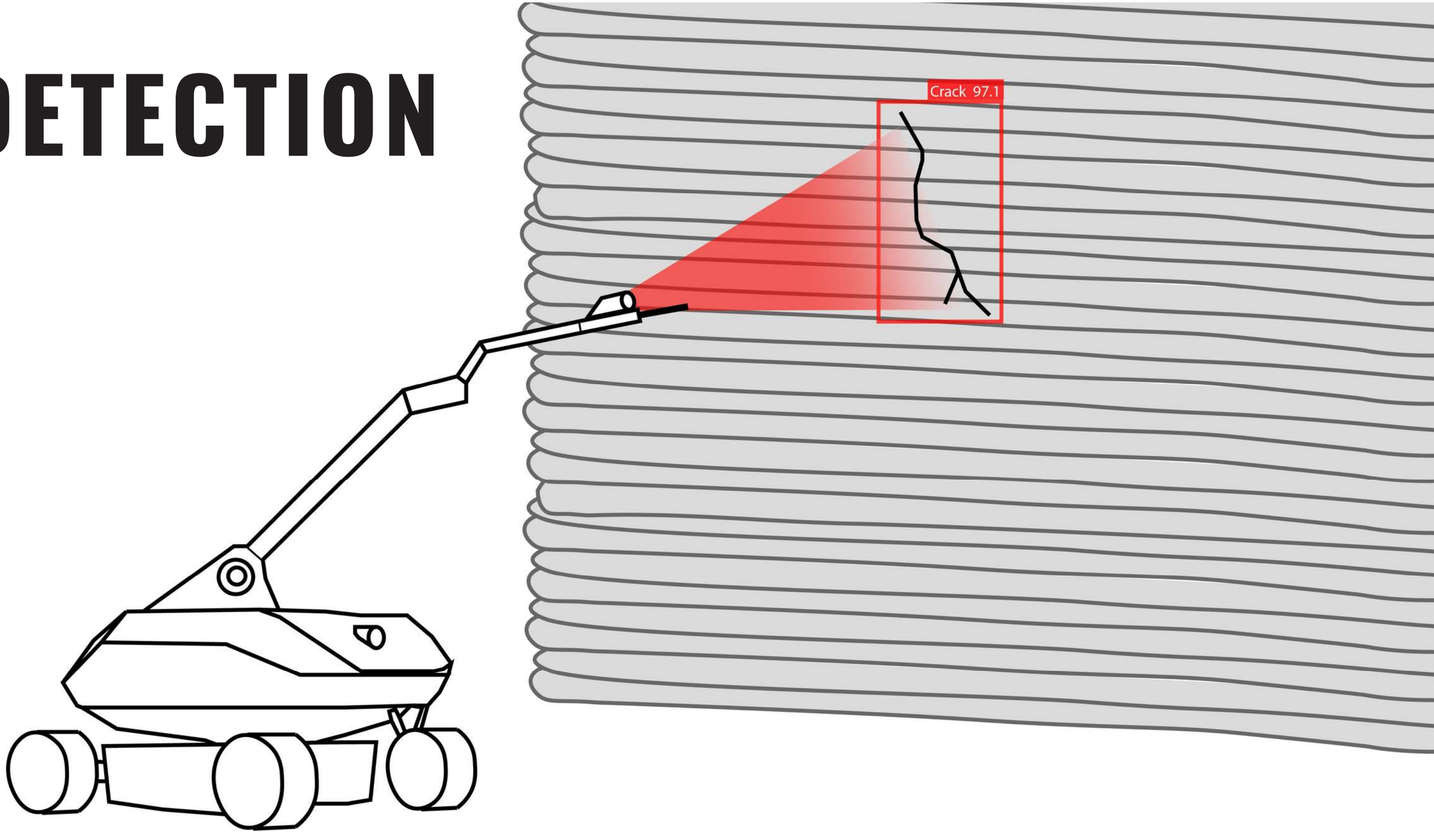




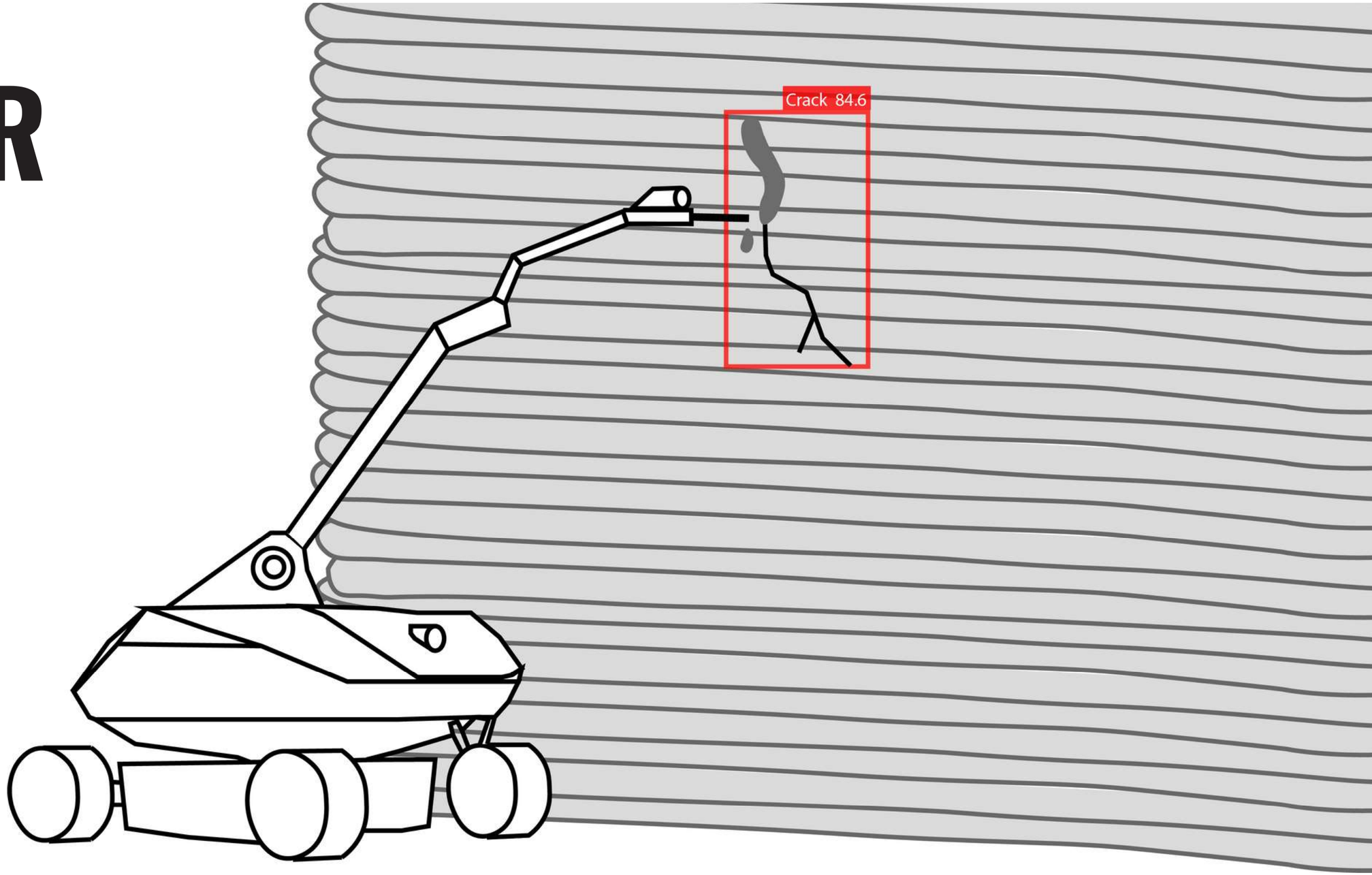
MAINTANANCE & PROTECTION

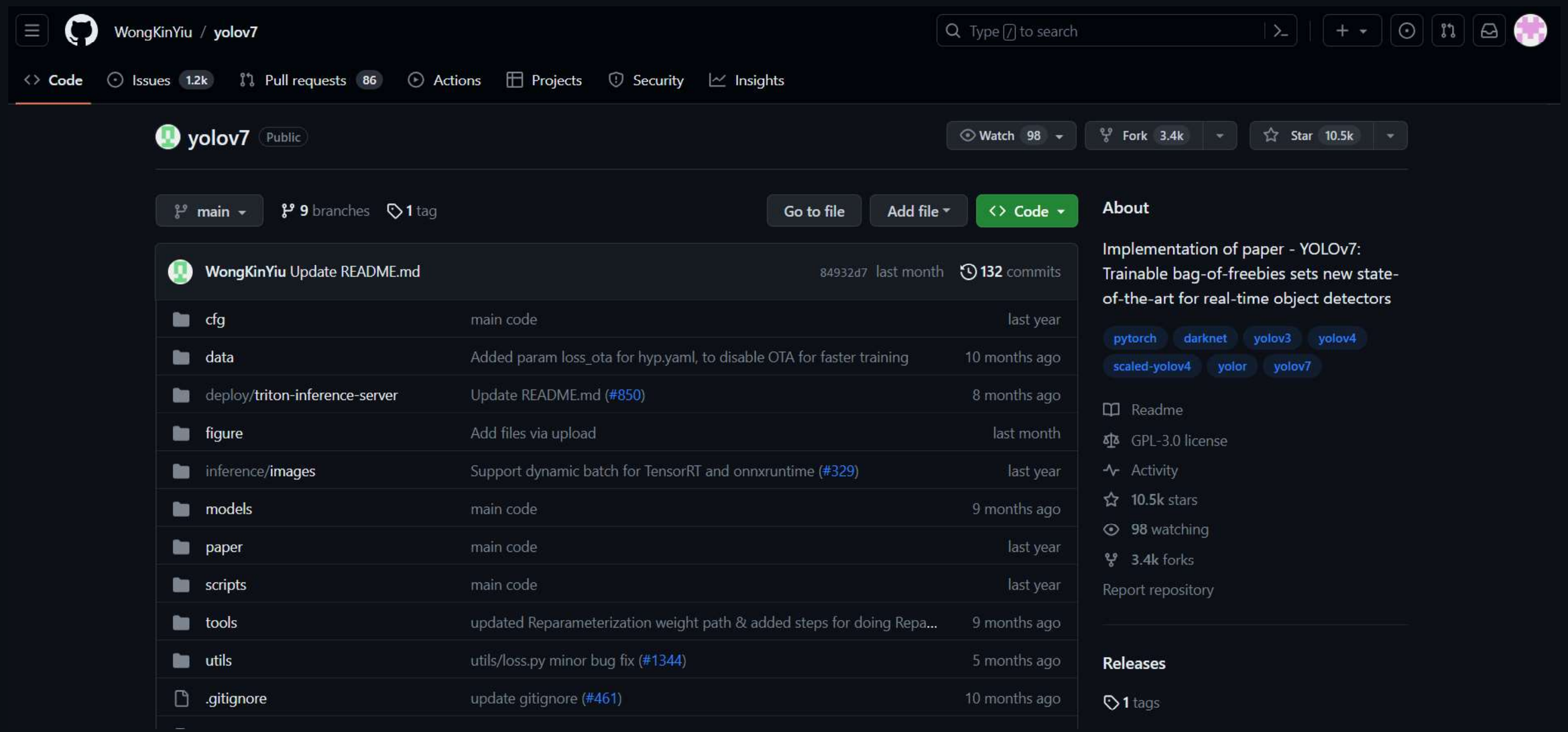
CV + HRI

DETECTION



REPAIR




WongKinYiu / yolov7
Type / to search
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Pull requests 86
Actions
Projects
Security
Insights
yolov7
Public
Watch 98
Fork 3.4k
Star 10.5k
main
9 branches
1 tag
Go to file
Add file
Code
WongKinYiu Update README.md
84932d7 last month
132 commits
cfg main code last year
data Added param loss_ota for hyp.yaml, to disable OTA for faster training 10 months ago
deploy/triton-inference-server Update README.md (#850) 8 months ago
figure Add files via upload last month
inference/images Support dynamic batch for TensorRT and onnxruntime (#329) last year
models main code 9 months ago
paper main code last year
scripts main code last year
tools updated Reparameterization weight path & added steps for doing Repa... 9 months ago
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.gitignore update gitignore (#461) 10 months ago
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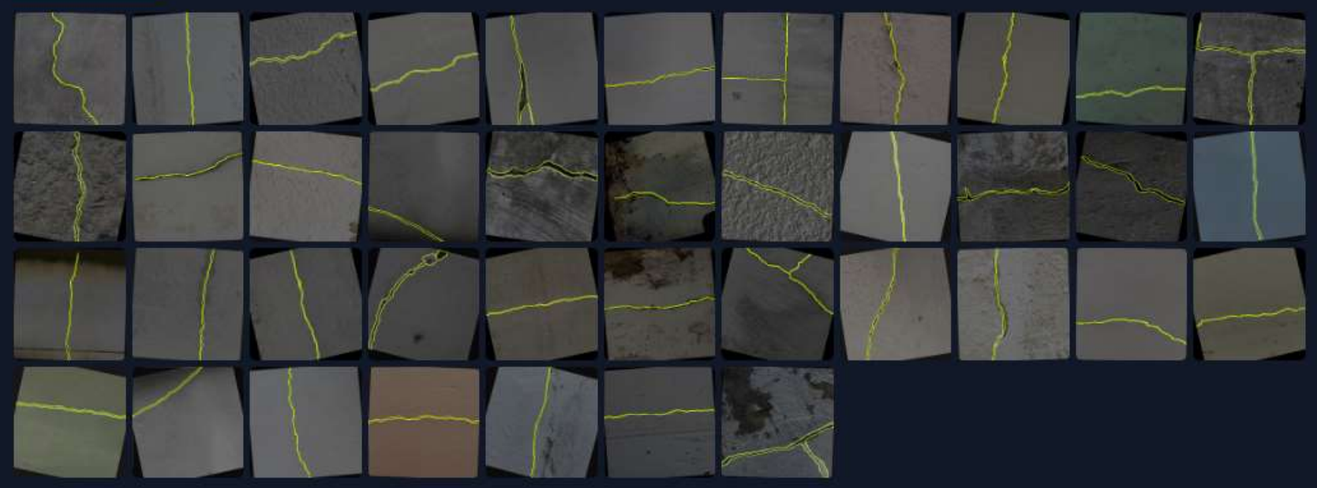

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Crack Detector ☆ yolo7-seg ☆ Concrete damag... ☆ defect detection ☆ 400 img ☆

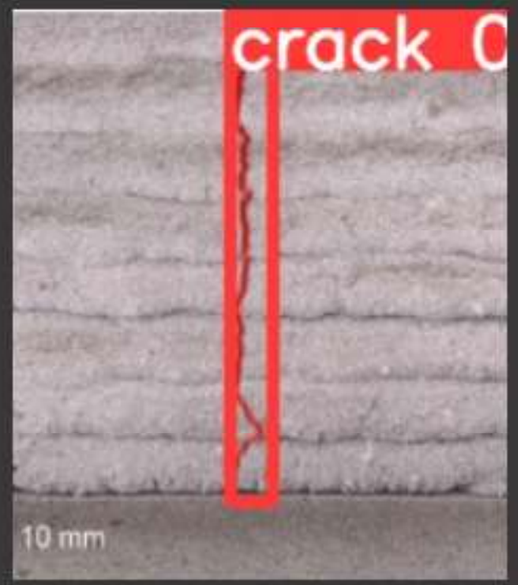
```
[ ] Using 2 dataloader workers
    Logging results to runs/train-seg/custom
    Starting training for 10 epochs...

          Epoch    GPU_mem   box_loss   seg_loss   obj_loss   cls_loss  Instances       Size
            0/9      12.8G    0.07064    0.04226    0.02526          0         15        640: 100% 233/233 [03:43<00:00,  1.04it/s]
                    Class     Images  Instances      Box(P          R      mAP50  mAP50-95)     Mask(P          R      mAP50  mAP50-95): 100% 7/7 [00:05<00:00,  1.18it/s]
                      all        200        249      0.733      0.551      0.575      0.226      0.572      0.478      0.365     0.0924

          Epoch    GPU_mem   box_loss   seg_loss   obj_loss   cls_loss  Instances       Size
            1/9      12.3G    0.04831    0.02473    0.01802          0         13        640: 100% 233/233 [03:36<00:00,  1.08it/s]
                    Class     Images  Instances      Box(P          R      mAP50  mAP50-95)     Mask(P          R      mAP50  mAP50-95): 100% 7/7 [00:05<00:00,  1.33it/s]
                      all        200        249      0.627      0.586        0.6      0.297       0.48      0.474      0.377      0.103

          Epoch    GPU_mem   box_loss   seg_loss   obj_loss   cls_loss  Instances       Size
            2/9      12.3G    0.04559    0.02405    0.01454          0          7        640: 100% 233/233 [03:34<00:00,  1.09it/s]
                    Class     Images  Instances      Box(P          R      mAP50  mAP50-95)     Mask(P          R      mAP50  mAP50-95): 100% 7/7 [00:05<00:00,  1.38it/s]
                      all        200        249      0.444      0.506      0.417      0.189       0.34      0.393      0.228     0.0616

          Epoch    GPU_mem   box_loss   seg_loss   obj_loss   cls_loss  Instances       Size
            3/9      12.3G    0.04035    0.02363    0.01382          0         15        640: 100% 233/233 [03:34<00:00,  1.09it/s]
                    Class     Images  Instances      Box(P          R      mAP50  mAP50-95)     Mask(P          R      mAP50  mAP50-95): 100% 7/7 [00:05<00:00,  1.39it/s]
                      all        200        249      0.549      0.636      0.618      0.343      0.445      0.558      0.429      0.127

          Epoch    GPU_mem   box_loss   seg_loss   obj_loss   cls_loss  Instances       Size
            4/9      12.3G    0.03702    0.02345    0.01295          0         15        640: 100% 233/233 [03:34<00:00,  1.09it/s]
                    Class     Images  Instances      Box(P          R      mAP50  mAP50-95)     Mask(P          R      mAP50  mAP50-95): 100% 7/7 [00:05<00:00,  1.39it/s]
                      all        200        249      0.778      0.667      0.667      0.361      0.663      0.558      0.467       0.14

          Epoch    GPU_mem   box_loss   seg_loss   obj_loss   cls_loss  Instances       Size
            5/9      12.3G    0.03239    0.02297    0.01272          0         10        640: 100% 233/233 [03:34<00:00,  1.09it/s]
                    Class     Images  Instances      Box(P          R      mAP50  mAP50-95)     Mask(P          R      mAP50  mAP50-95): 100% 7/7 [00:05<00:00,  1.40it/s]
                      all        200        249      0.753      0.622      0.686      0.406       0.58      0.546      0.441      0.136
```

```python
import glob
from IPython.display import Image, display

for imageName in glob.glob('runs/predict-seg/exp32/print_test11.png')[:2]:
      display(Image(filename=imageName))
      print("\n")
```

```python
# Fill the middle row with ones
kernel_v[:, int((kernel_size - 1)/2)] = np.ones(kernel_size)

# Normalize
kernel_v /= kernel_size

# Apply the vertical kernel
vertical_mb = cv2.filter2D(img, -1, kernel_v)

# Save the outputs
cv2.imwrite('test_vertical.jpg', vertical_mb)

# Print out
img2 = cv2.imread('test_vertical.jpg', cv2.IMREAD_UNCHANGED)
cv2_imshow(img2)
```

0s

```
import glob
from IPython.display import Image, display

for imageName in glob.glob('runs/predict-seg/exp9/print_test1.jpg')[:2]:
      display(Image(filename=imageName))
      print("\n")
```



0s

```
import glob
from IPython.display import Image, display

for imageName in glob.glob('runs/predict-seg/exp25/print_test7.png')[:2]:
      display(Image(filename=imageName))
      print("\n")
```

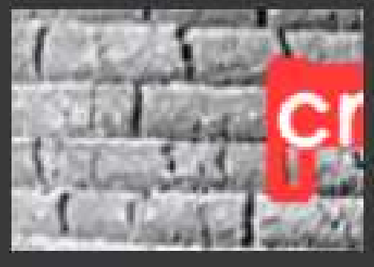


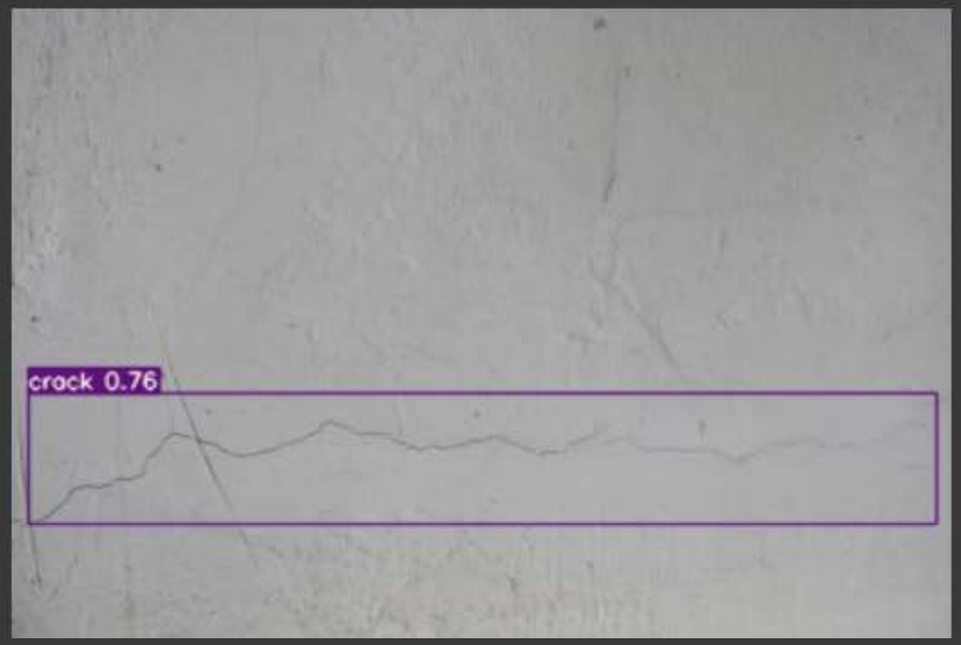
Photo by Martijn Baudoin on Unsplash

Custom YOLOv7 Object Detection with TensorFlow.js

Training a custom YOLOv7 model in PyTorch and converting it to TensorFlow.js for real-time offline detection on the browser

```
[ ] %cd /content/yolov7
    !python train.py --epochs 64 --workers 4 --device 0 --batch-size 32 \
    --data /content/yolov7/data.yaml --img 640 640 --cfg /content/yolov7/cfg/training/yolov7_crack-tiny.yaml \
    --weights 'yolov7-tiny.pt' --name yolov7_tiny_crack --hyp data/hyp.scratch.tiny.yaml

    Image sizes 640 train, 640 test
    Using 2 dataloader workers
    Logging results to runs/train/yolov7_tiny_crack
    Starting training for 64 epochs...

         Epoch   gpu_mem       box       obj       cls     total    labels  img_size
          0/63     0.47G   0.07802   0.01106         0   0.08908        14       640: 100% 117/117 [03:14<00:00,  1.66s/it]
                   Class      Images      Labels           P           R      mAP@.5  mAP@.5:.95: 100% 4/4 [00:04<00:00,  1.16s/it]
                     all         200         249      0.0289         0.1      0.0174     0.00411

         Epoch   gpu_mem       box       obj       cls     total    labels  img_size
          1/63     5.11G   0.05707   0.01035         0   0.06742        10       640: 100% 117/117 [02:59<00:00,  1.53s/it]
                   Class      Images      Labels           P           R      mAP@.5  mAP@.5:.95: 100% 4/4 [00:03<00:00,  1.15it/s]
                     all         200         249        0.28       0.341       0.185      0.0428

        Epoch   gpu_mem       box       obj       cls     total    labels  img_size
          2/63     6.26G   0.04459  0.009907         0    0.0545        28       640: 100% 117/117 [02:56<00:00,  1.51s/it]
                   Class      Images      Labels           P           R      mAP@.5  mAP@.5:.95: 100% 4/4 [00:04<00:00,  1.05s/it]
                     all         200         249       0.604       0.465       0.497        0.18

        Epoch   gpu_mem       box       obj       cls     total    labels  img_size
          3/63     6.26G   0.03898  0.009411         0   0.04839        11       640: 100% 117/117 [02:56<00:00,  1.51s/it]
                   Class      Images      Labels           P           R      mAP@.5  mAP@.5:.95: 100% 4/4 [00:03<00:00,  1.17it/s]
                     all         200         249       0.604       0.588       0.559       0.227

        Epoch   gpu_mem       box       obj       cls     total    labels  img_size
          4/63     6.27G   0.03961  0.009165         0   0.04878        16       640: 100% 117/117 [03:06<00:00,  1.59s/it]
```


crack 0.14
crack 0.54


crack 0.76

Converting to TFJS

Pytorch to ONNX with NMS (and inference)

```
[ ] !python export.py --weights runs/train/yolov7_tiny_crack/weights/yolov7-tiny.pt \
        --grid  \
        --topk-all 100 --iou-thres 0.65 --conf-thres 0.35 \
        --img-size 640 640 --max-wh 640 # For onnxruntime, you need to specify this value as an integer, when it is 0 it means agnostic NMS,
                    # otherwise it is non-agnostic NMS
```

```
Namespace(weights='runs/train/yolov7_tiny_crack/weights/yolov7-tiny.pt', img_size=[640, 640], batch_size=1, dynamic=False, dynamic_batch=False, grid=True, end2end=False, max_wh=640, tc
YOLOR 🚀 v0.1-126-g84932d7 torch 2.0.1+cu118 CPU

Fusing layers...
/usr/local/lib/python3.10/dist-packages/torch/functional.py:504: UserWarning: torch.meshgrid: in an upcoming release, it will be required to pass the indexing argument. (Triggered inte
  return _VF.meshgrid(tensors, **kwargs)  # type: ignore[attr-defined]
Model Summary: 200 layers, 6006646 parameters, 6006646 gradients, 13.0 GFLOPS

Starting TorchScript export with torch 2.0.1+cu118...
/content/yolov7/models/yolo.py:52: TracerWarning: Converting a tensor to a Python boolean might cause the trace to be incorrect. We can't record the data flow of Python values, so this
  if self.grid[i].shape[2:4] != x[i].shape[2:4]:
TorchScript export success, saved as runs/train/yolov7_tiny_crack/weights/yolov7-tiny.torchscript.pt
CoreML export failure: No module named 'coremltools'

Starting TorchScript-Lite export with torch 2.0.1+cu118...
TorchScript-Lite export success, saved as runs/train/yolov7_tiny_crack/weights/yolov7-tiny.torchscript.ptl

Starting ONNX export with onnx 1.14.0...
/content/yolov7/models/yolo.py:582: TracerWarning: Converting a tensor to a Python boolean might cause the trace to be incorrect. We can't record the data flow of Python values, so thi
  if augment:
```

julialewandowska Hobby / crack-detection-deploy

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