

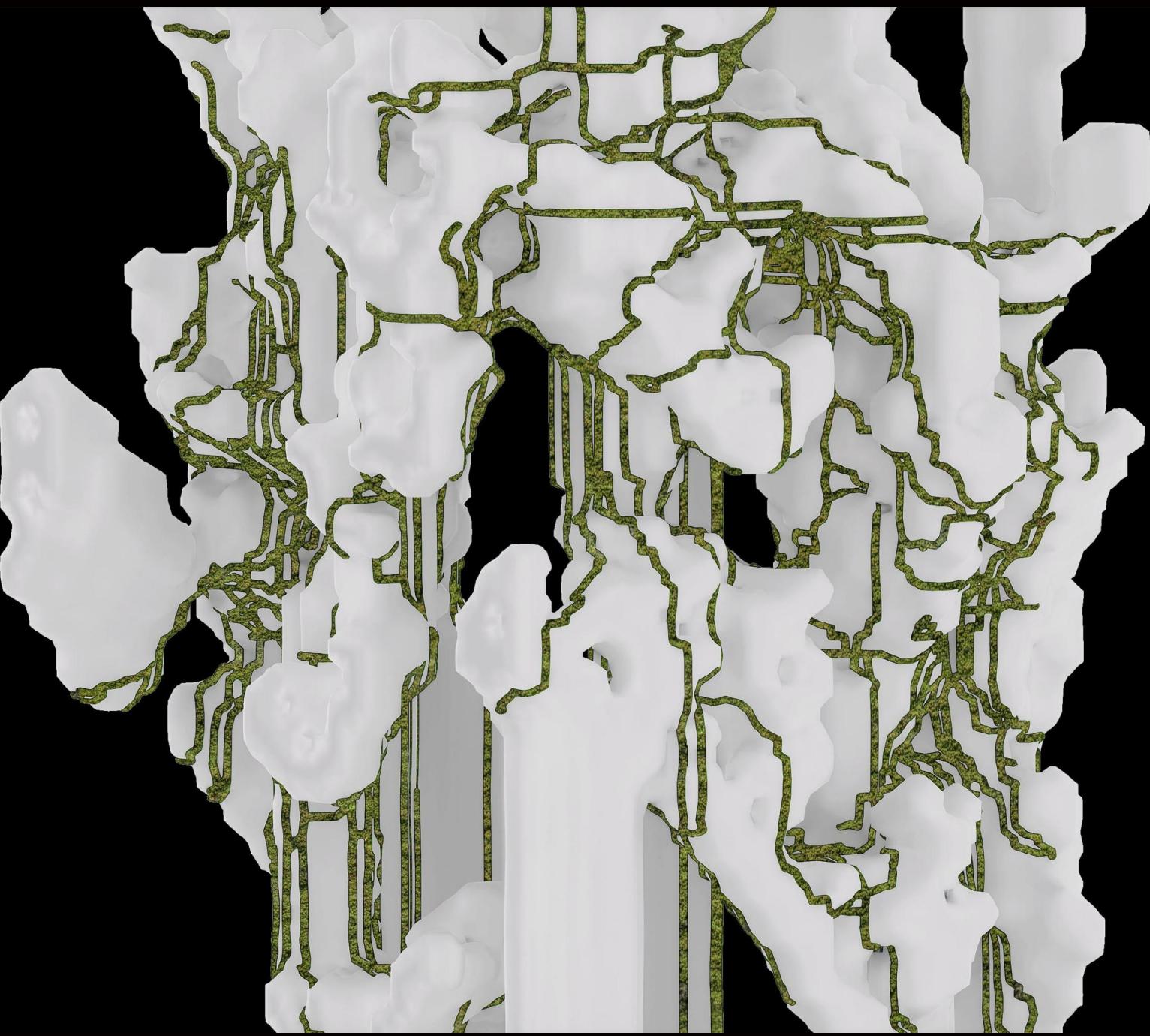


MArch Urban Design | RC 16
2024-2025

Student ID: 24075832
Tutor: Filippo Nassetti Shengyu Meng

SKILL COURSE 1: GRASSHOPPER //

MArch Urban Design RC 16
Student ID : 24075832
Tutor: Filippo Nassetti

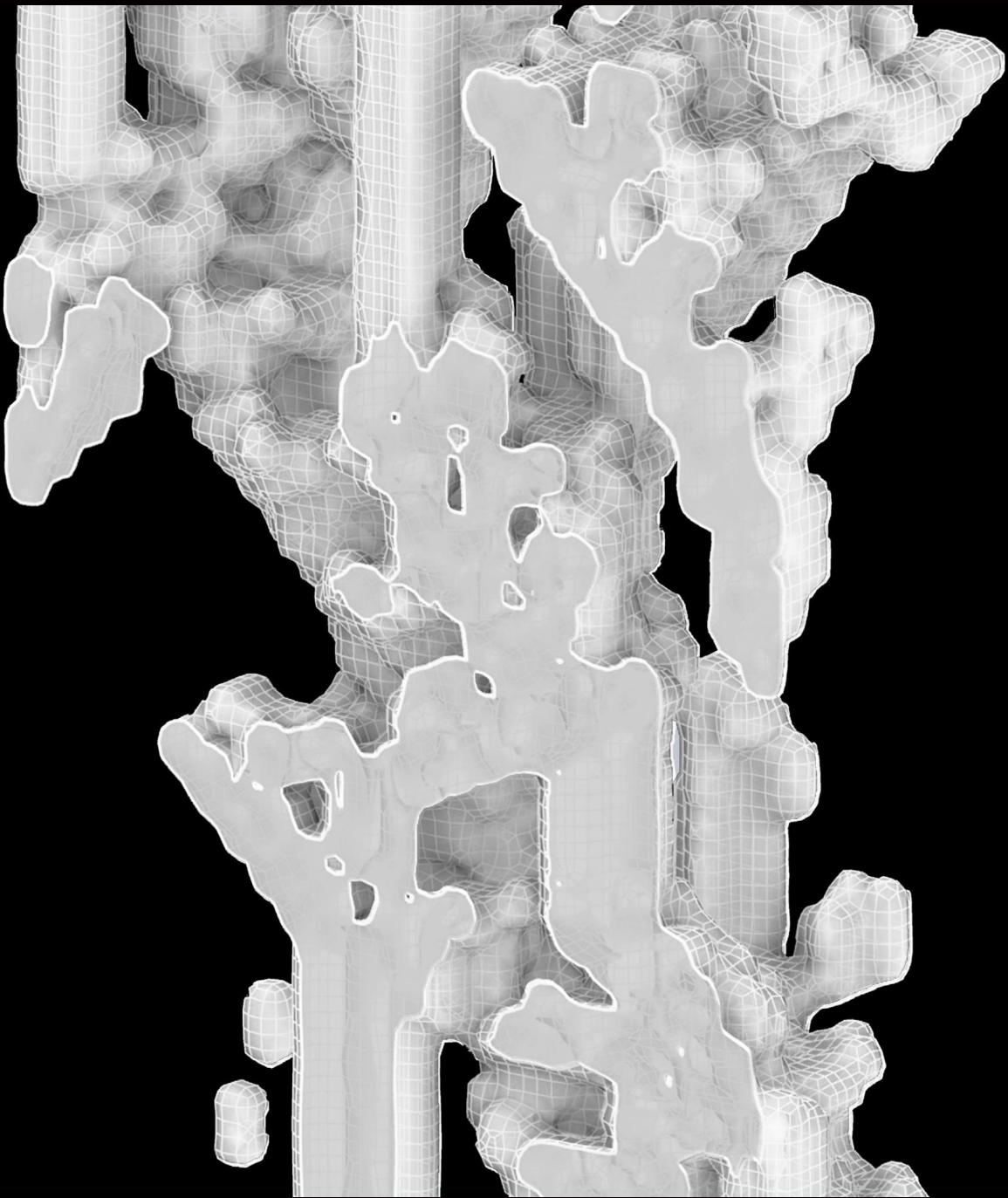


// SKILL COURSE 1

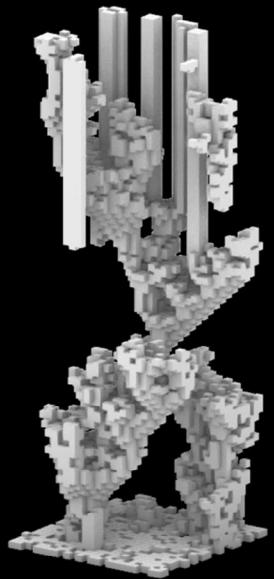
// GRASSHOPPER_CELLULARAUTOMATA

// Abstarct:

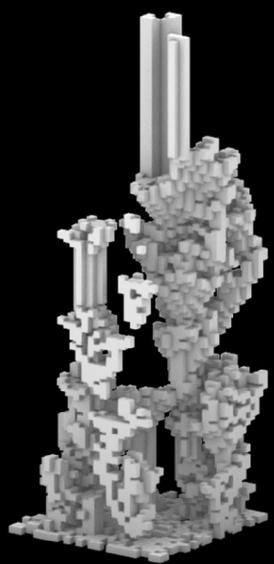
The research explores the application of cellular automata (CA) in the study of urban spatial morphology using Rhino Grasshopper. By simulating rule-based spatial evolution, the study examines how CA can generate dynamic, self-organizing patterns that adapt to various constraints. The findings demonstrate that CA-driven methods can produce complex and flexible spatial layouts, enhancing computational design strategies. This approach contributes to the integration of generative design principles in architecture and urban design, offering new possibilities for adaptive and efficient spatial configurations.



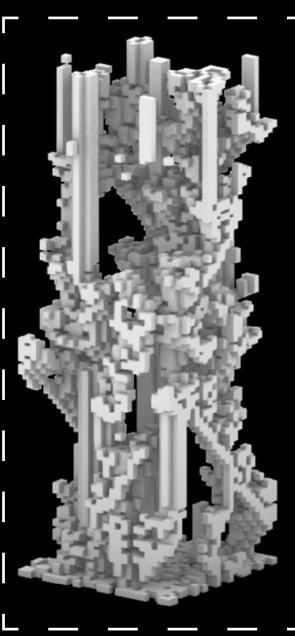
CATALOGUE



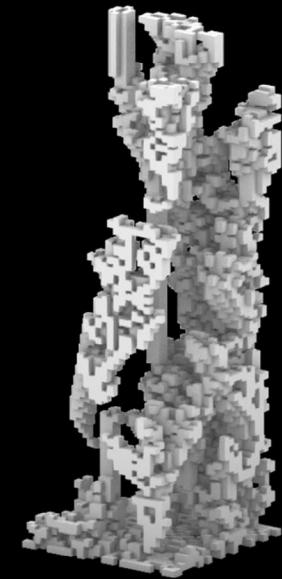
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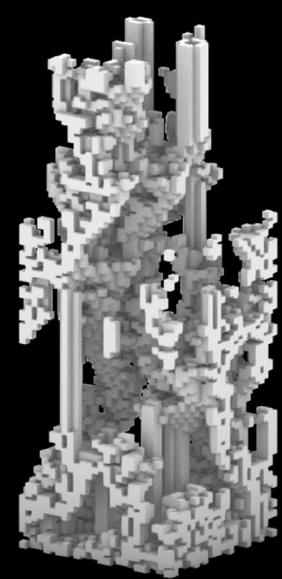
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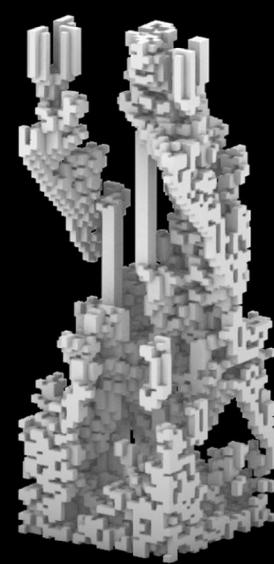
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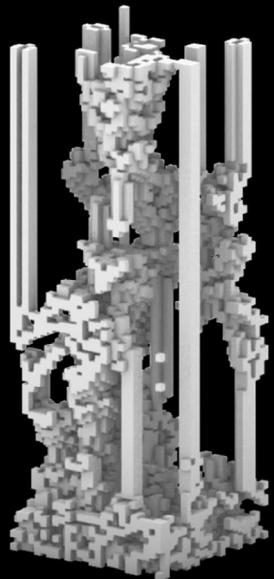
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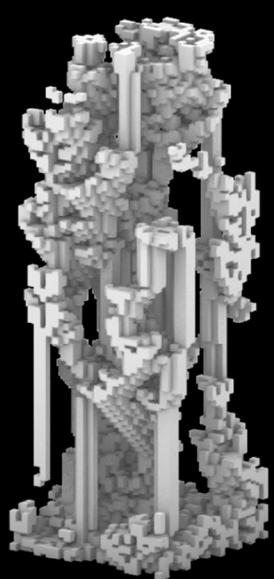
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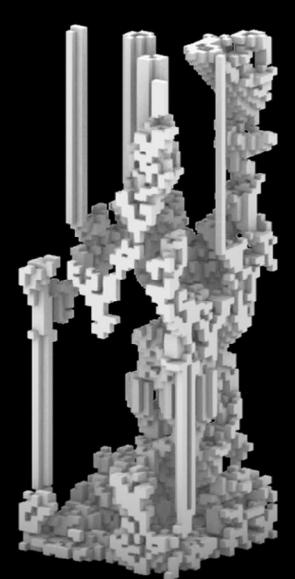
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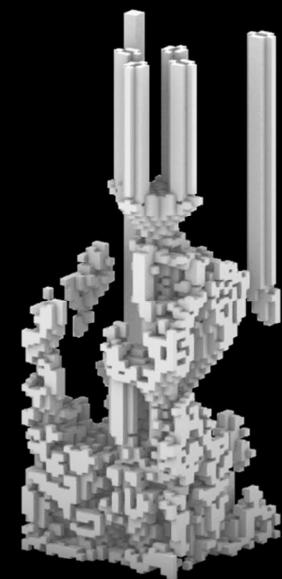
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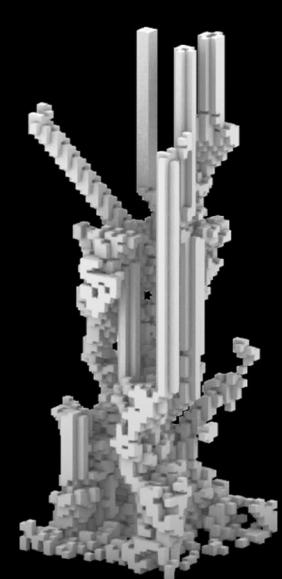
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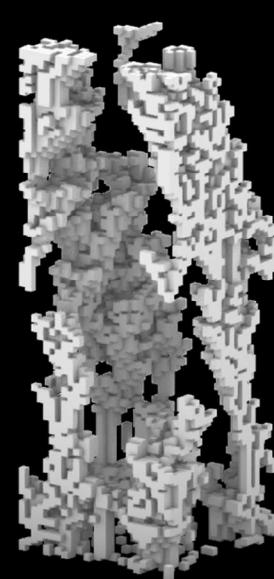
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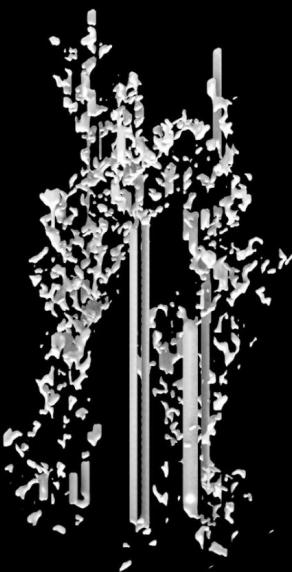


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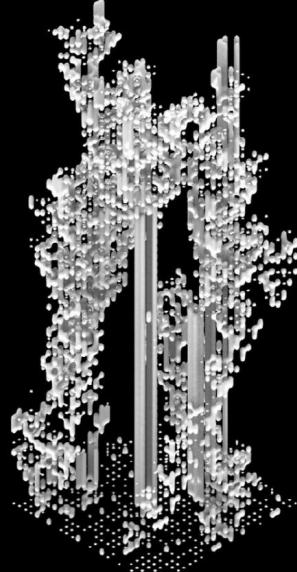


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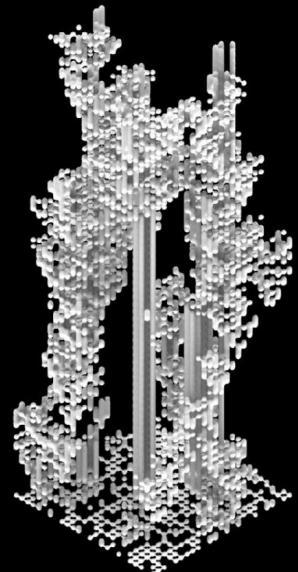
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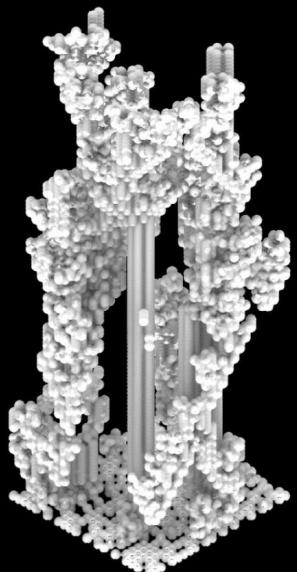
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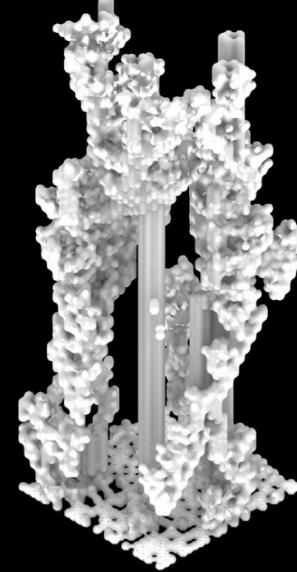
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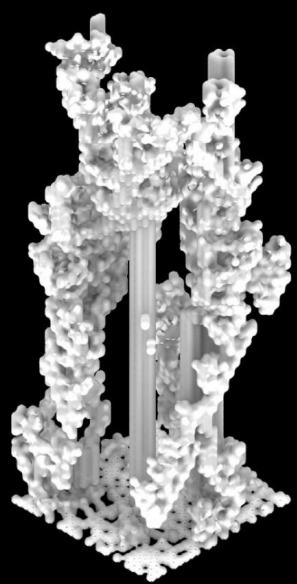
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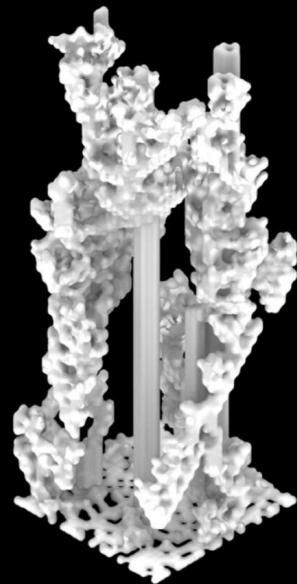
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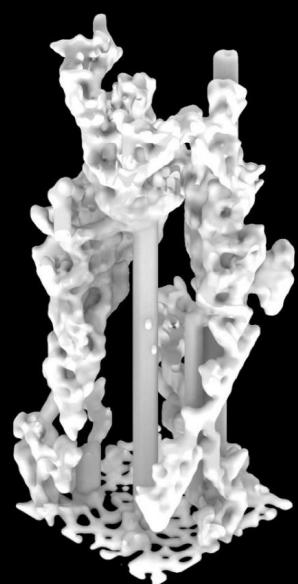
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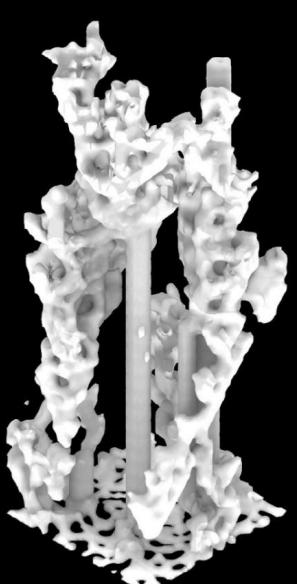
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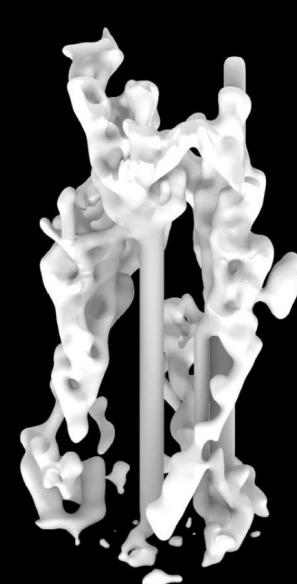
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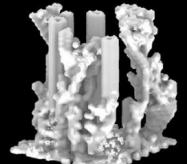
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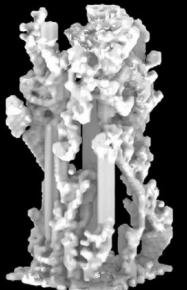
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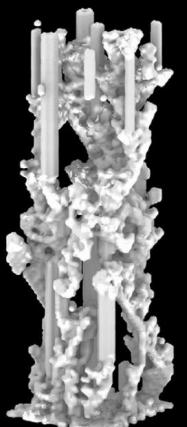
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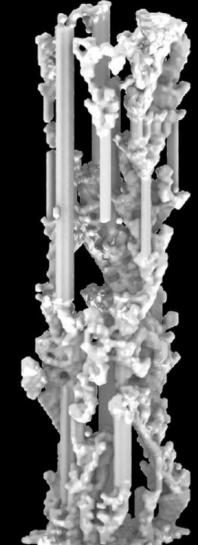
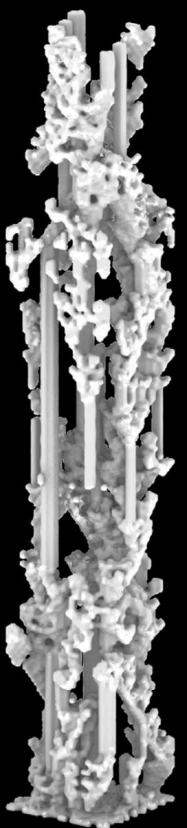
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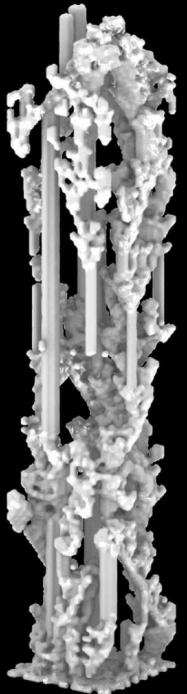
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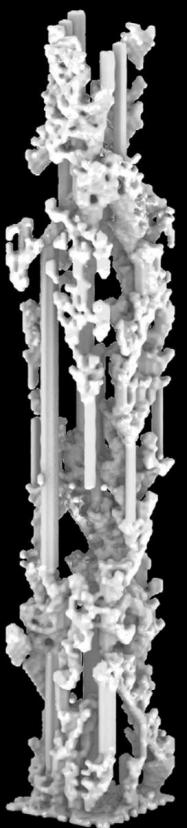
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layer200

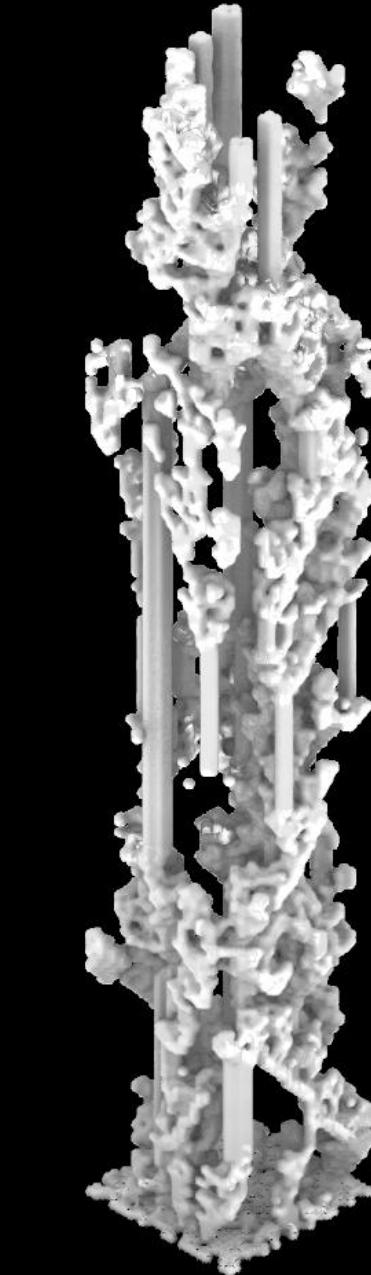
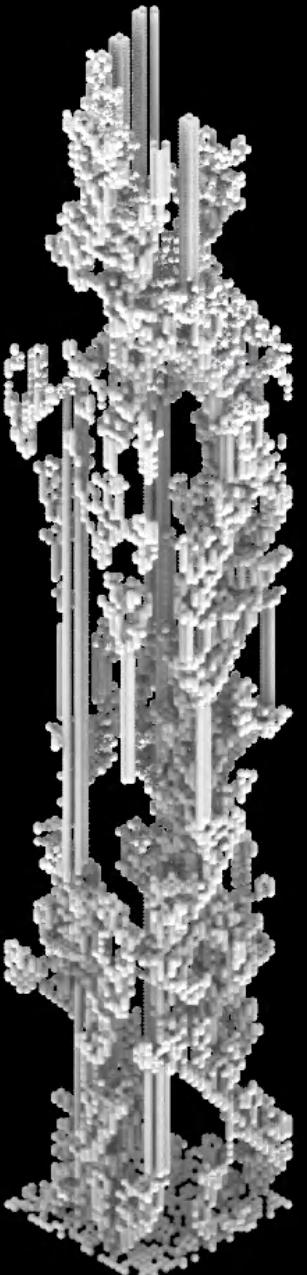


layer250

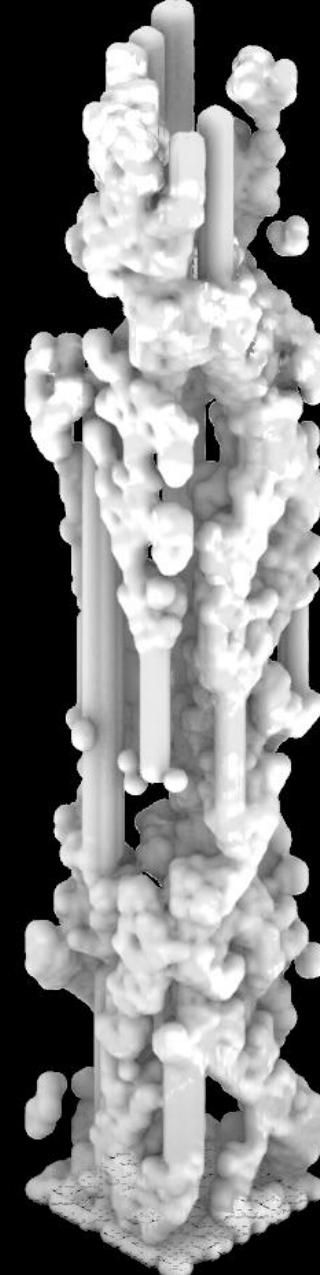


layer300

radius: 5; voxel size:2



radius: 7; voxel size:4.5



radius: 14; voxel size:4.5



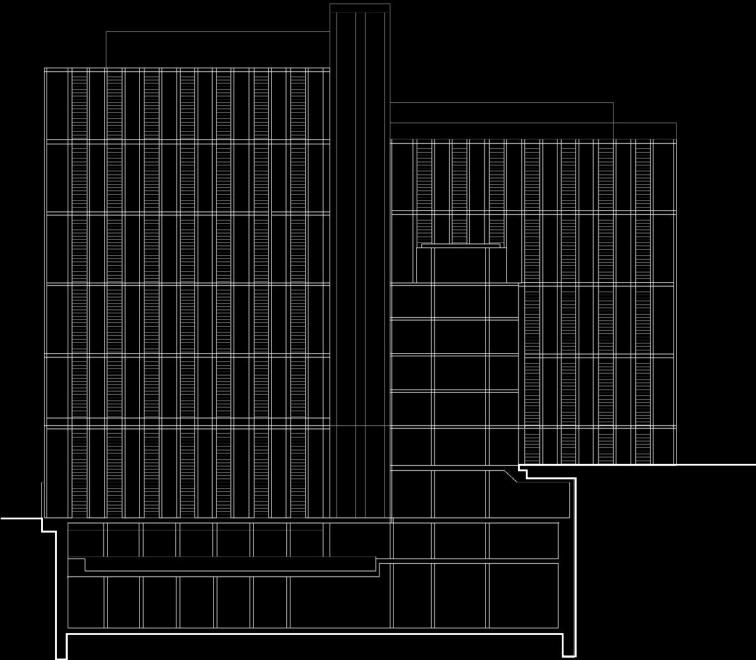
// SKILL COURSE 1 // GRASSHOPPER_SHORTESTWALK

// Mandarin Oriental Mayfair, London

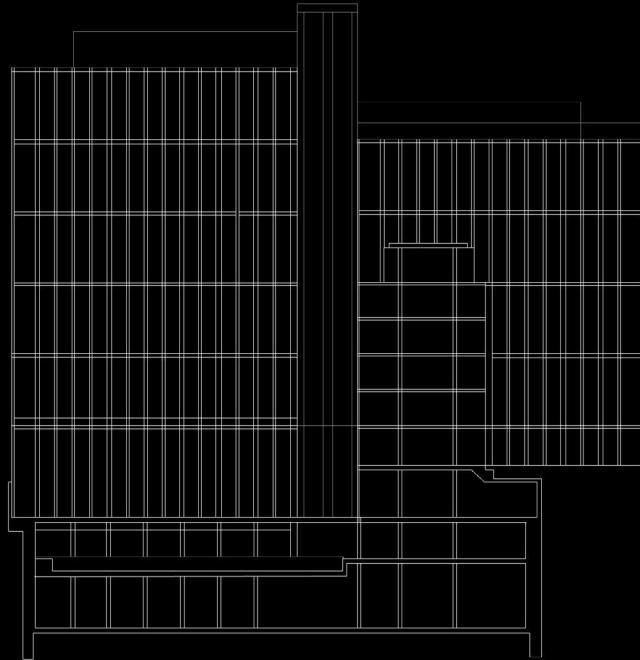
RSHP has designed a contemporary mixed-use development for Mandarin Oriental Mayfair, inspired by the original Georgian architecture of the historic Hanover Square in the heart of London's Mayfair Conservation Area. The Mandarin Oriental Mayfair offers 50 guest rooms and suites and 77 private residences, restaurants, two bars, and a spa with a 25-metre pool.

RSHP's development provides a contemporary townscape response to the unique scale and historic urban grain of Hanover Square. The design seeks to achieve a contemporary language that responds to the rhythm, articulation, colouration and proportion of the local context.

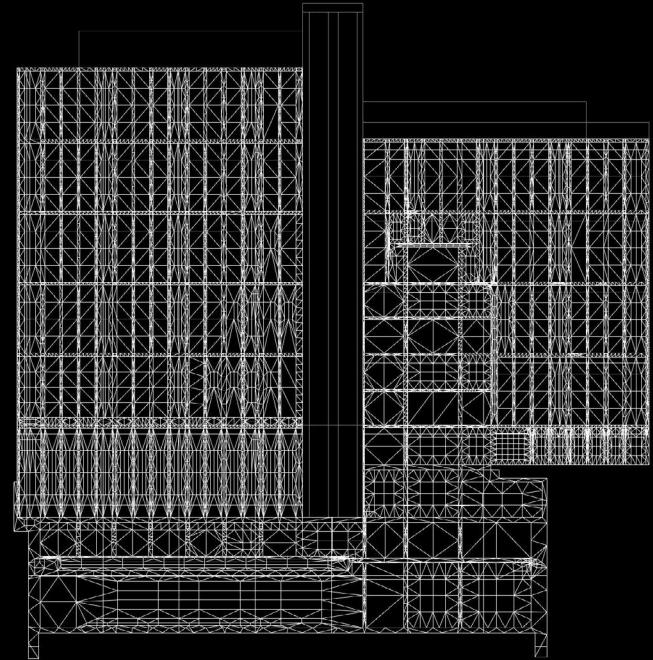
2D PROCESS_CURVE TO SHORTEST WALK



Facade_01

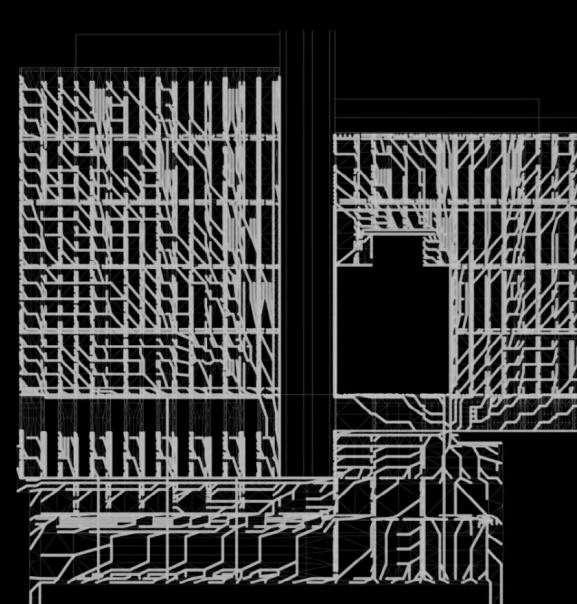
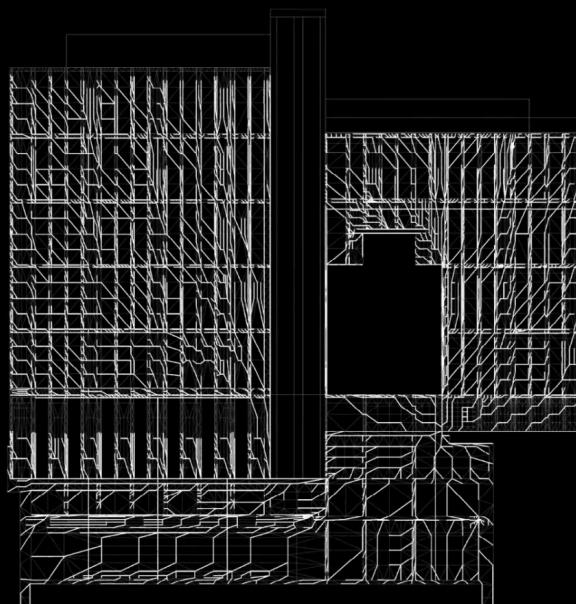
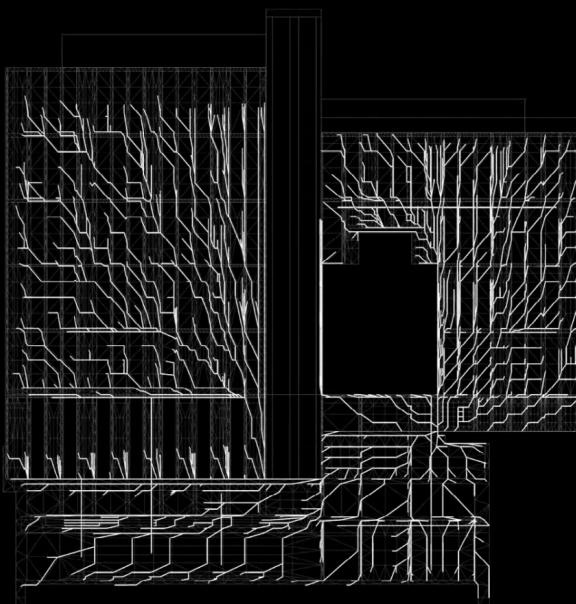
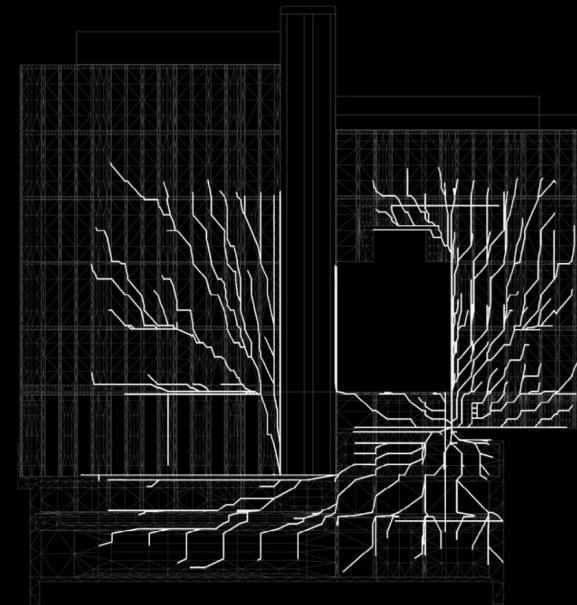
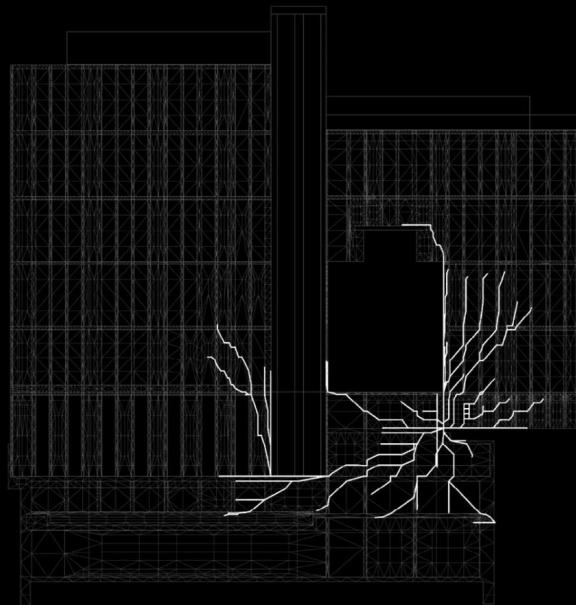
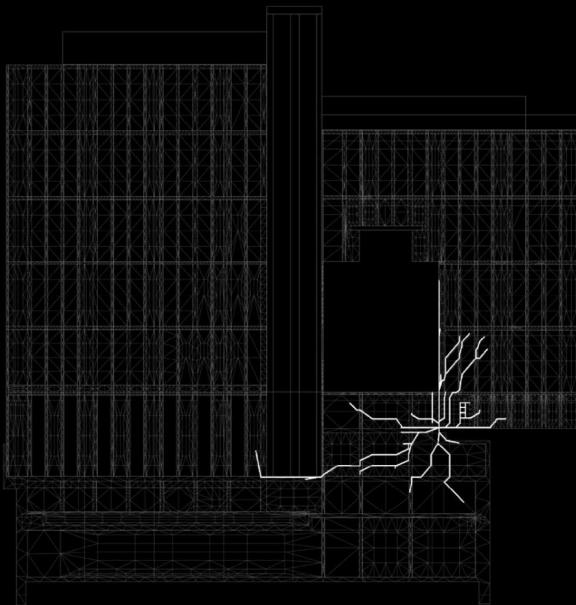


Lines_02

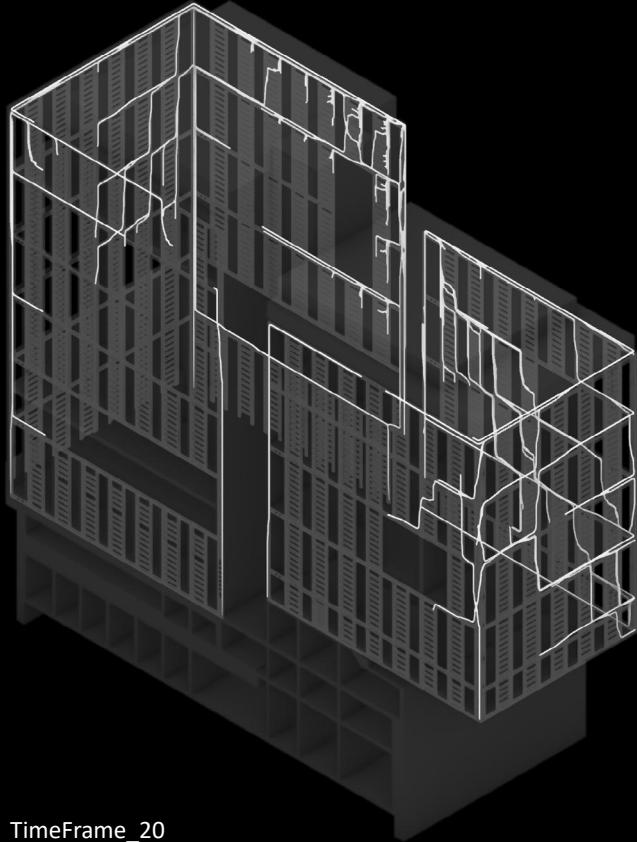


Mesh_03

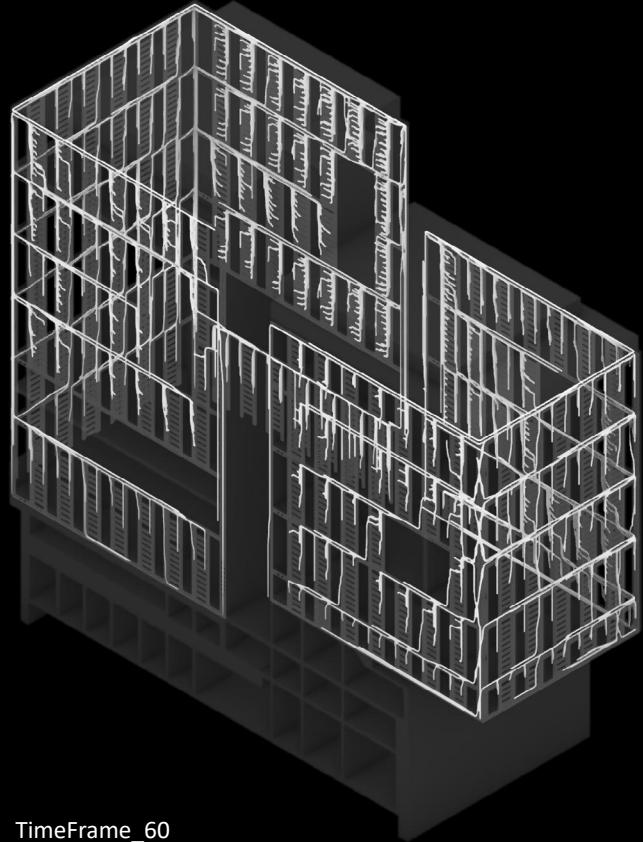
2D PROCESS_CURVE TO SHORTEST WALK



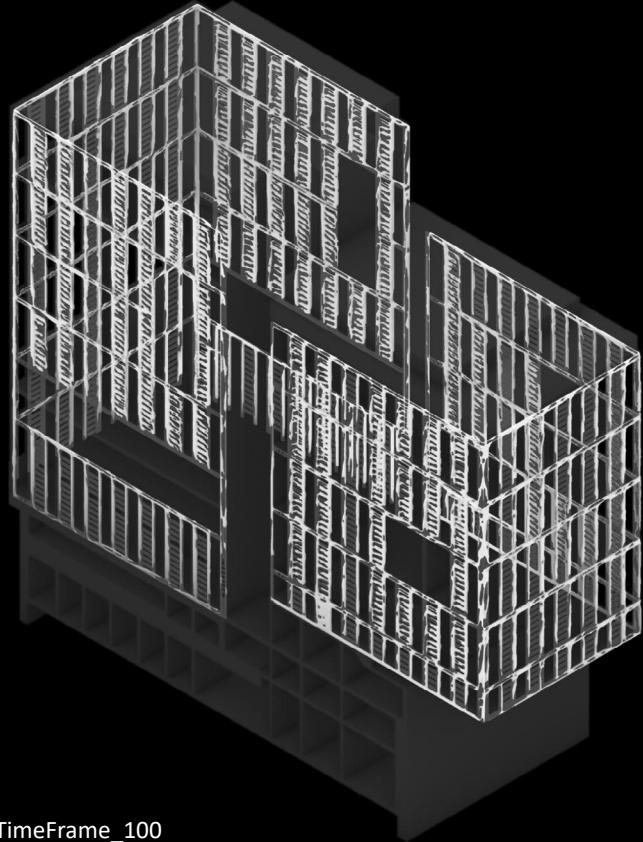
3D PROCESS_CURVE TO SHORTEST WALK



TimeFrame_20



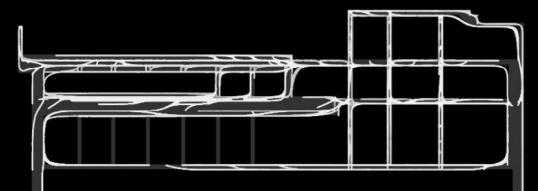
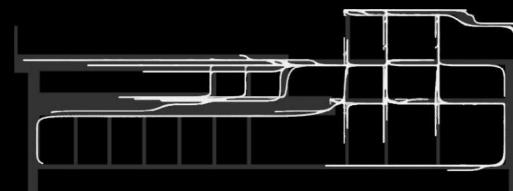
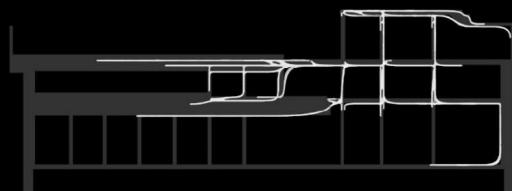
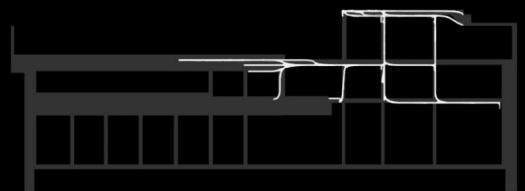
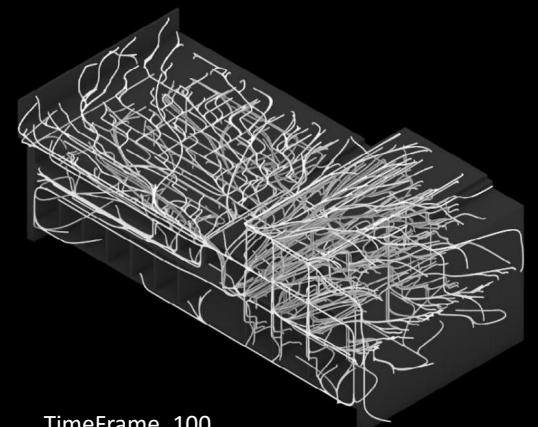
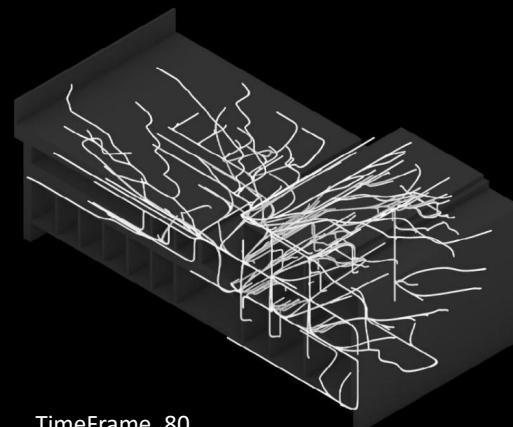
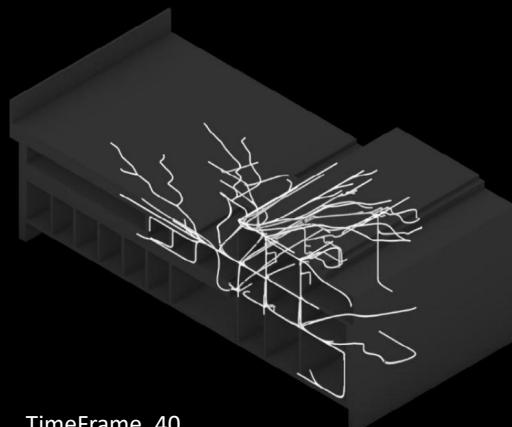
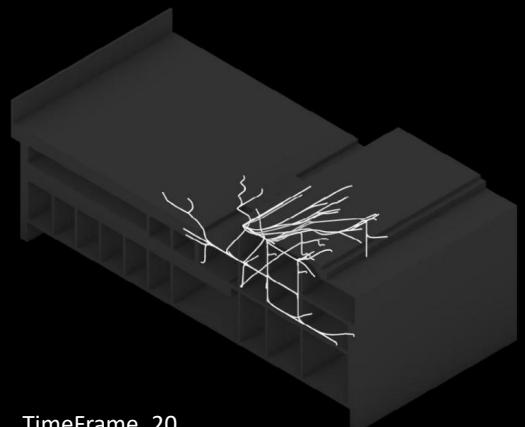
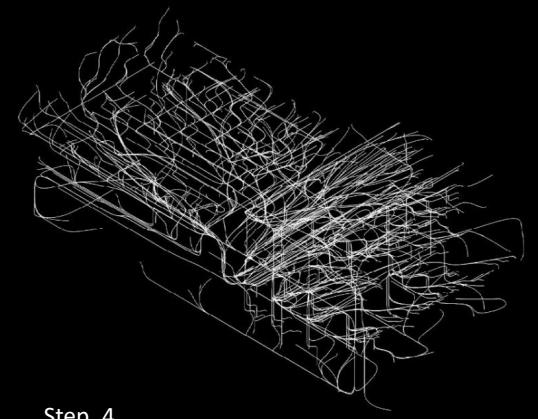
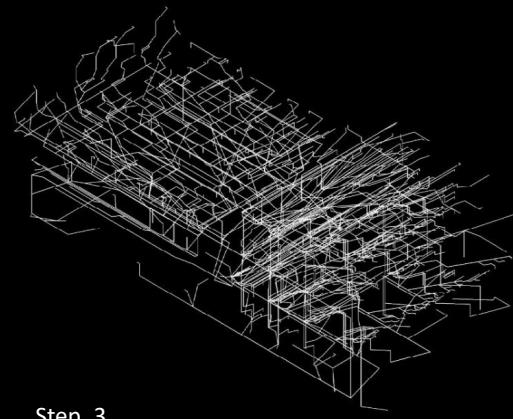
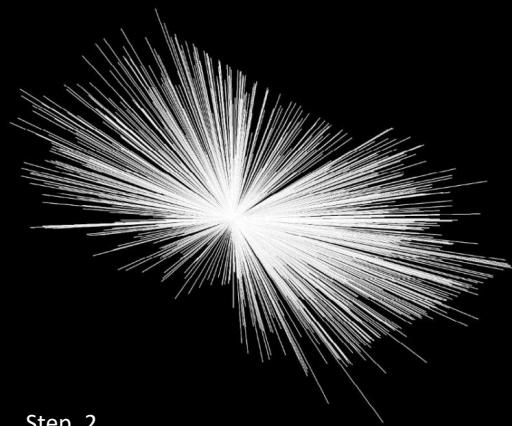
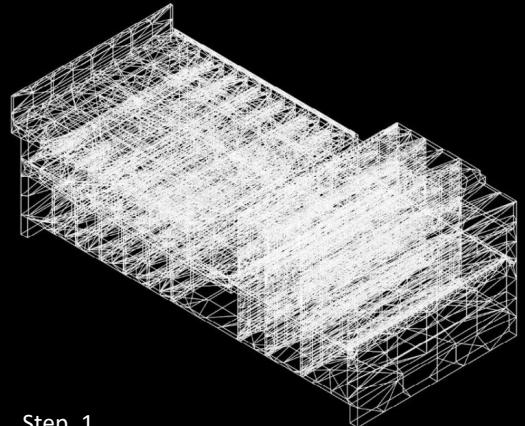
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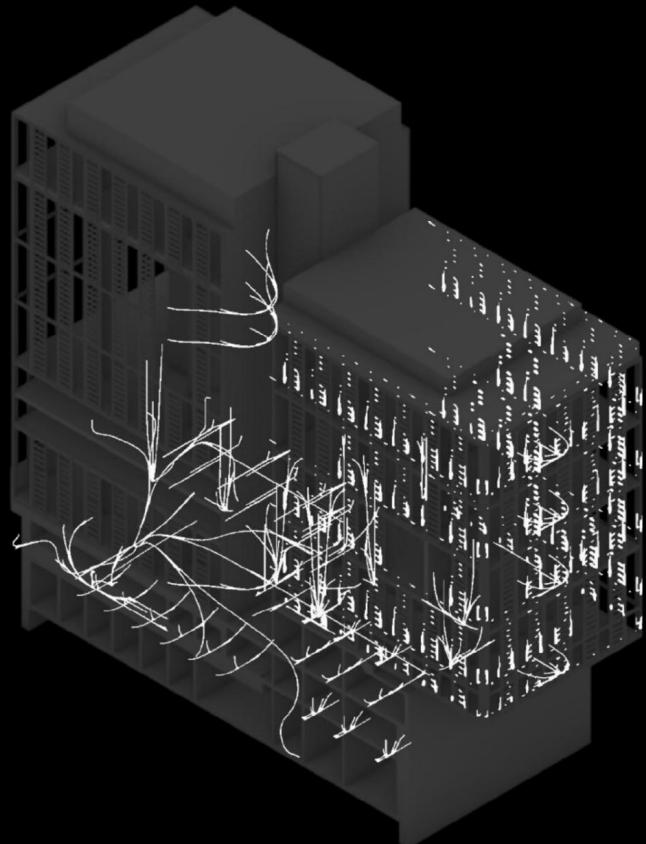
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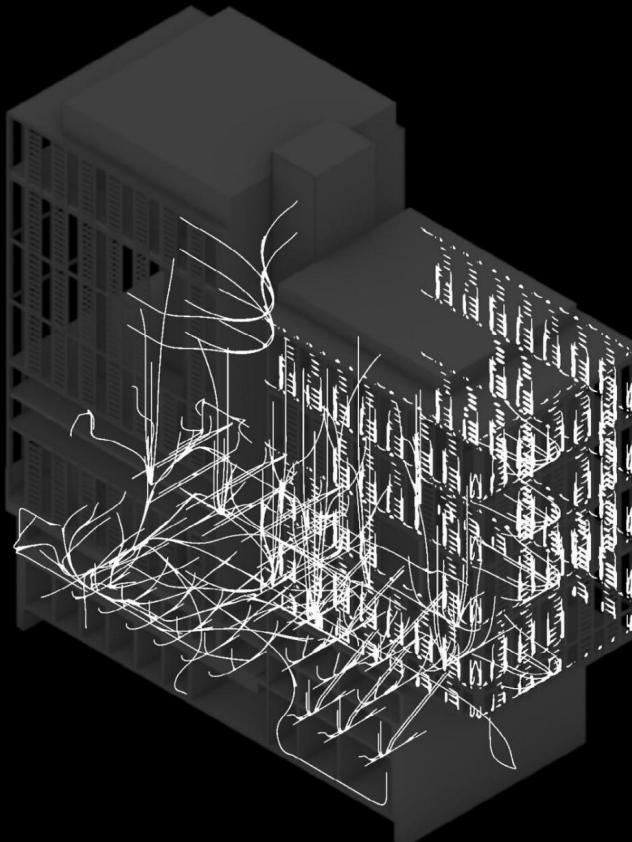
3D PROCESS_MESH TO SHORTEST WALK



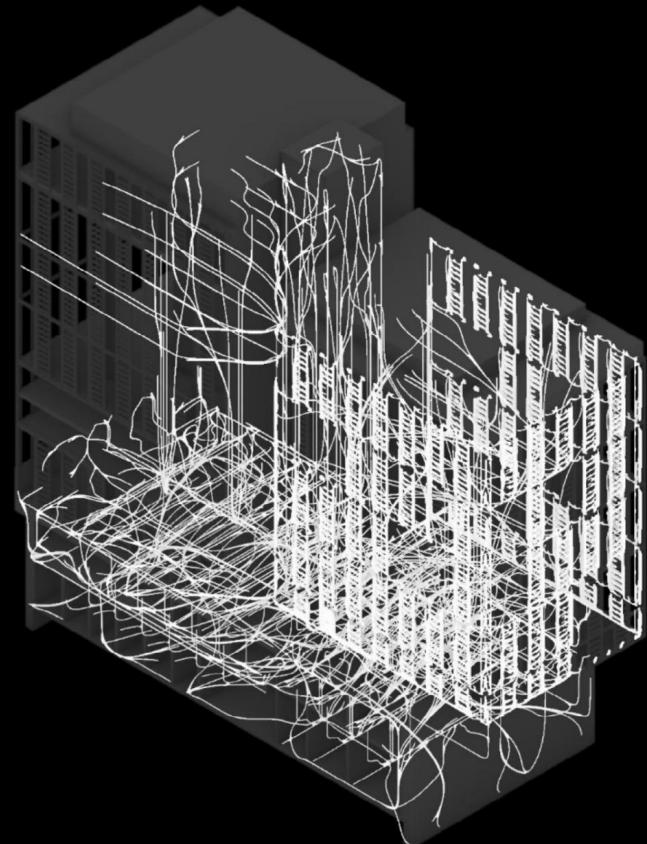
3D PROCESS_MESH TO SHORTEST WALK



TimeFrame_20

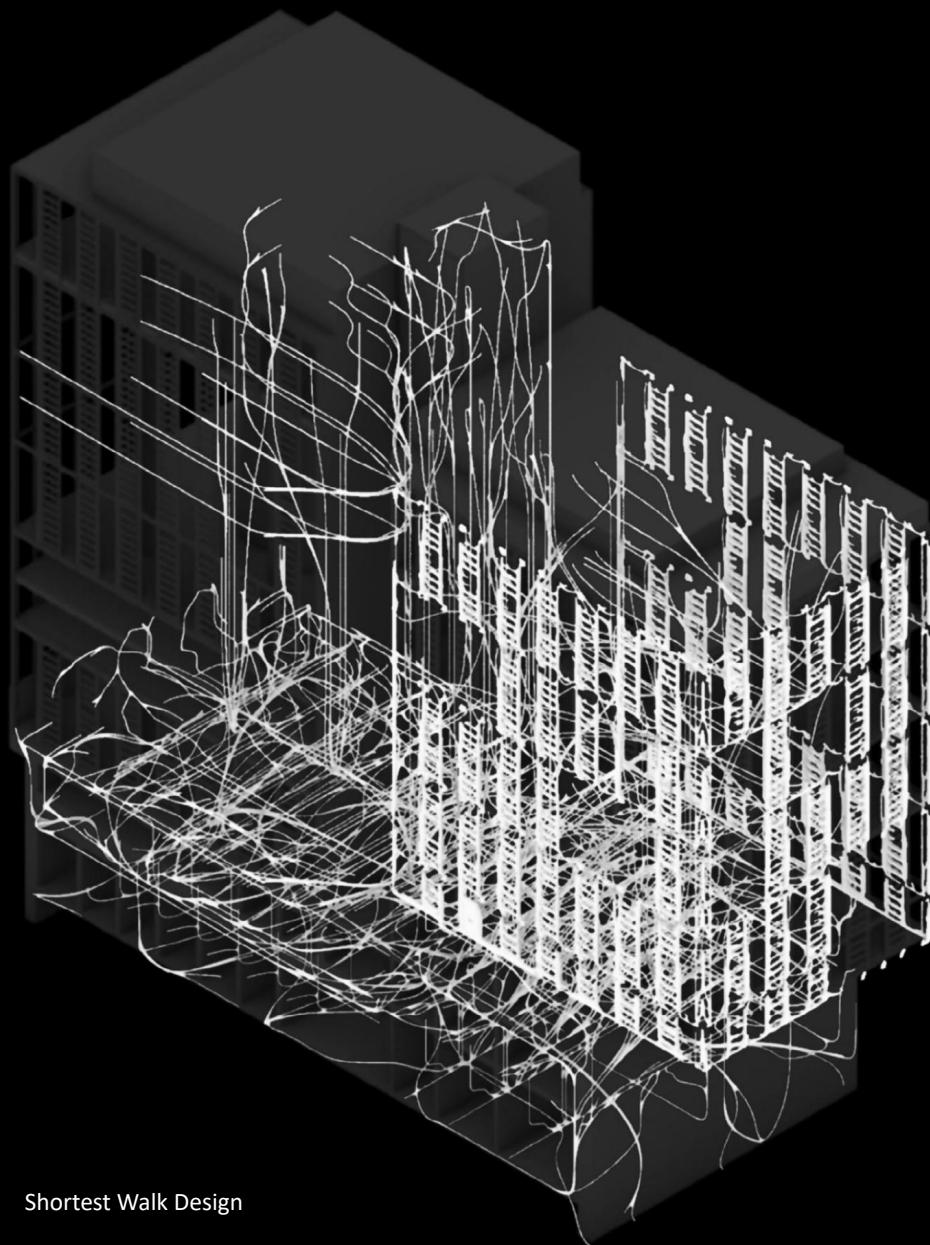


TimeFrame_60

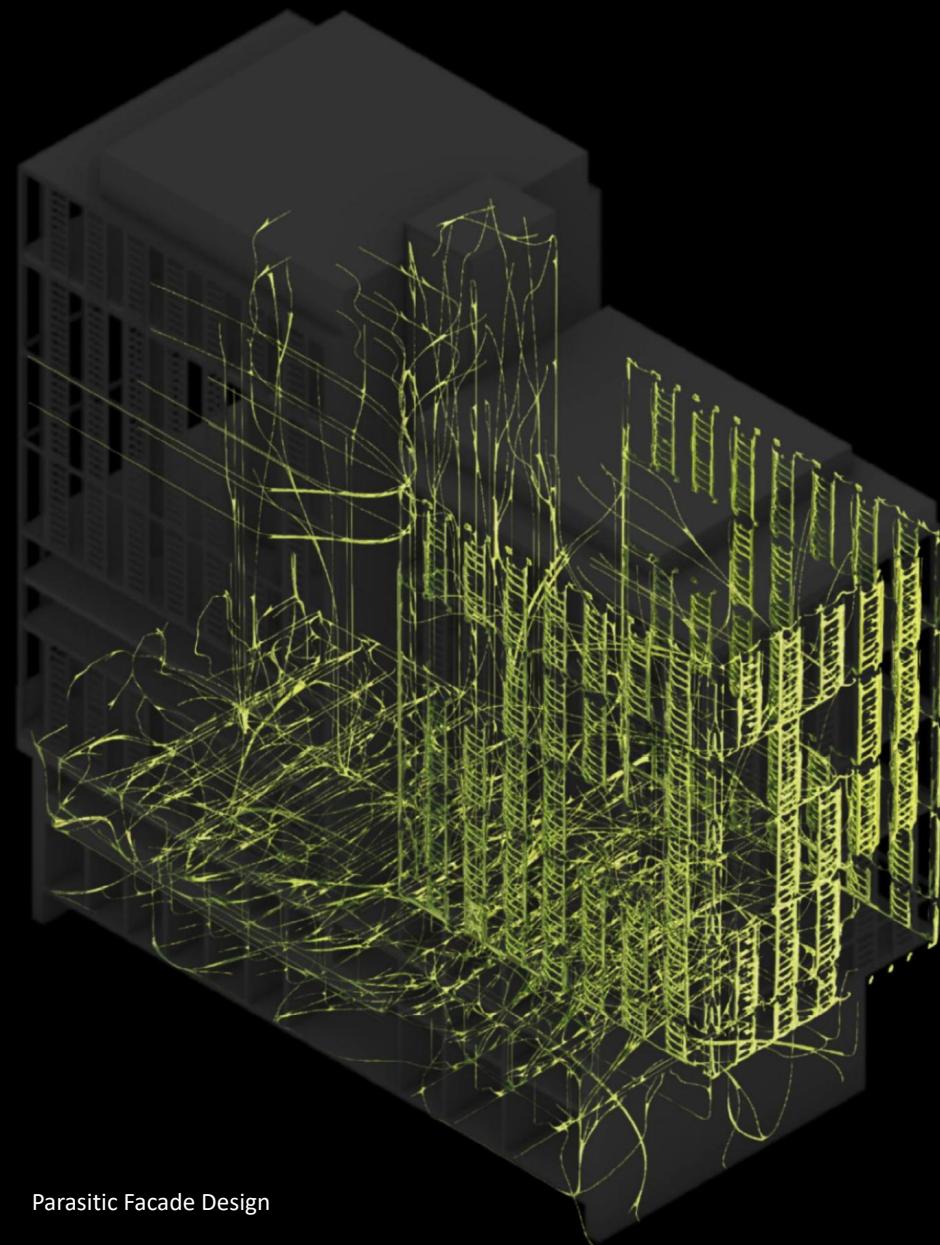


TimeFrame_100

3D PROCESS_ MESH TO SHORTEST WALK

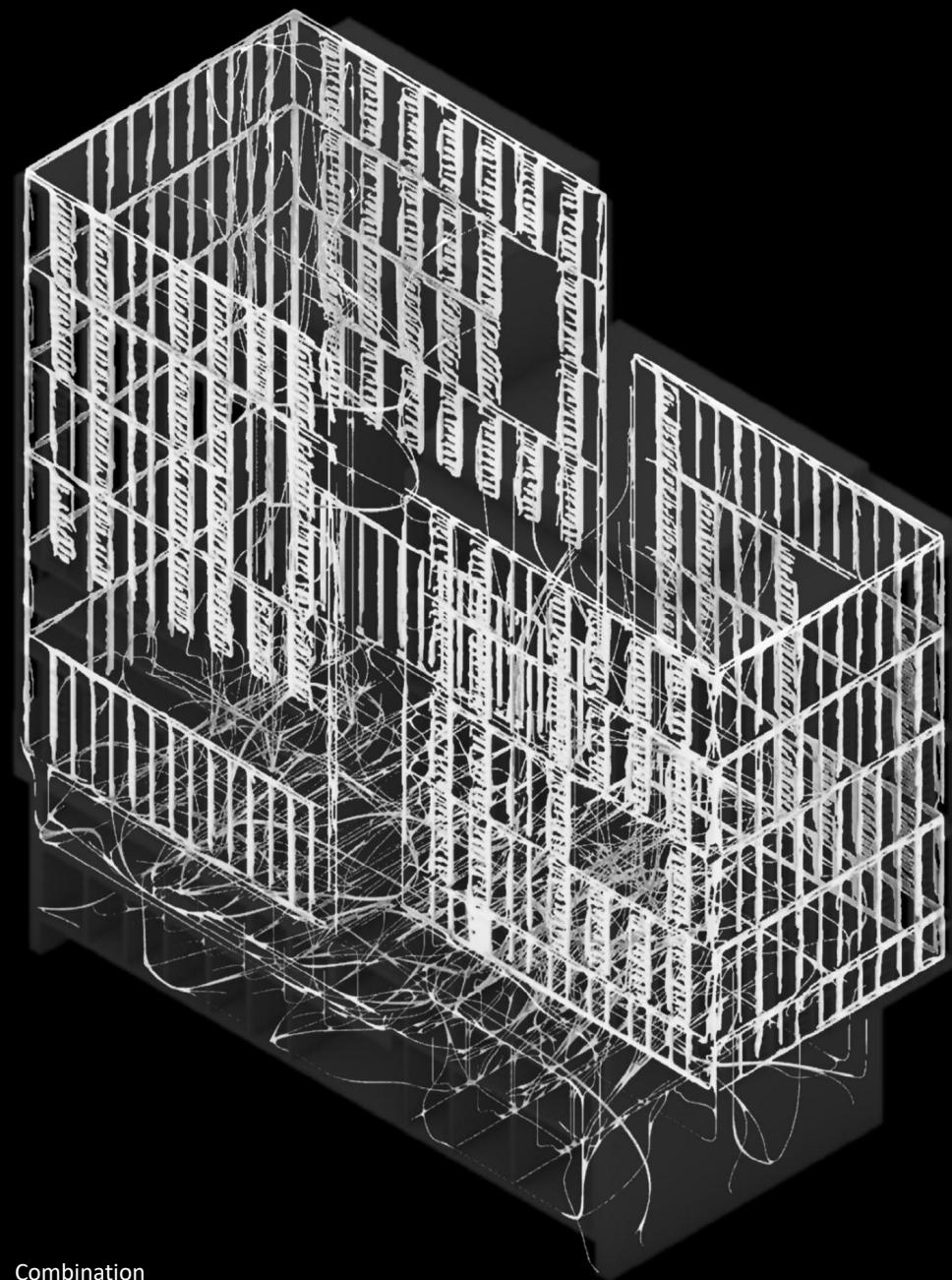
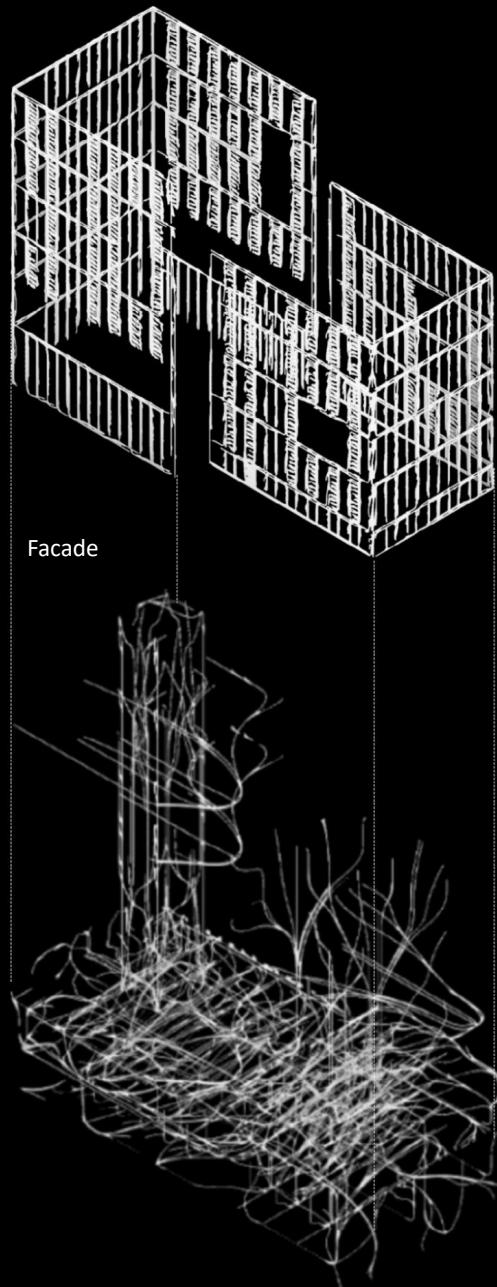
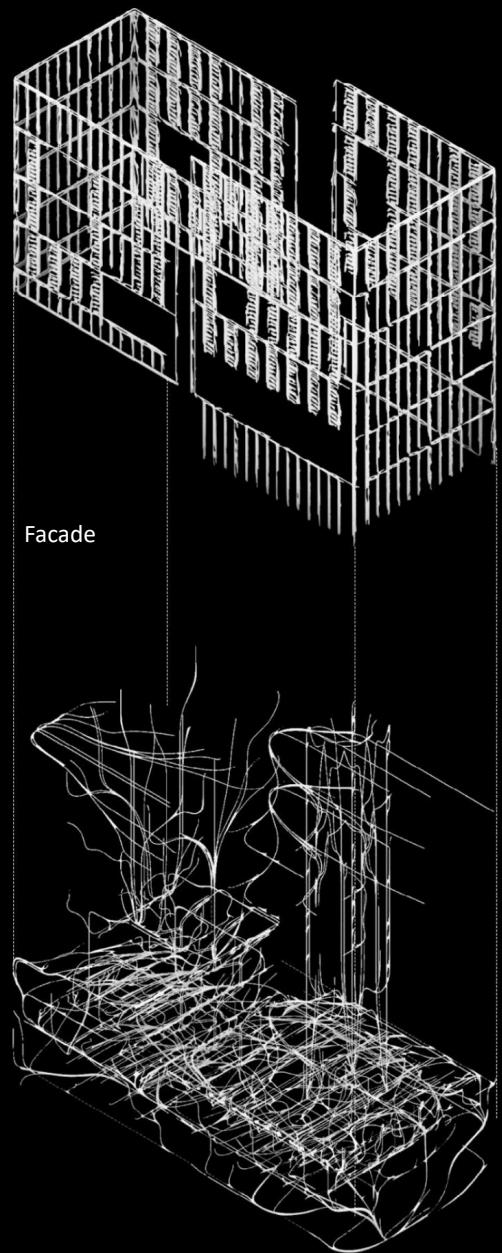


Shortest Walk Design

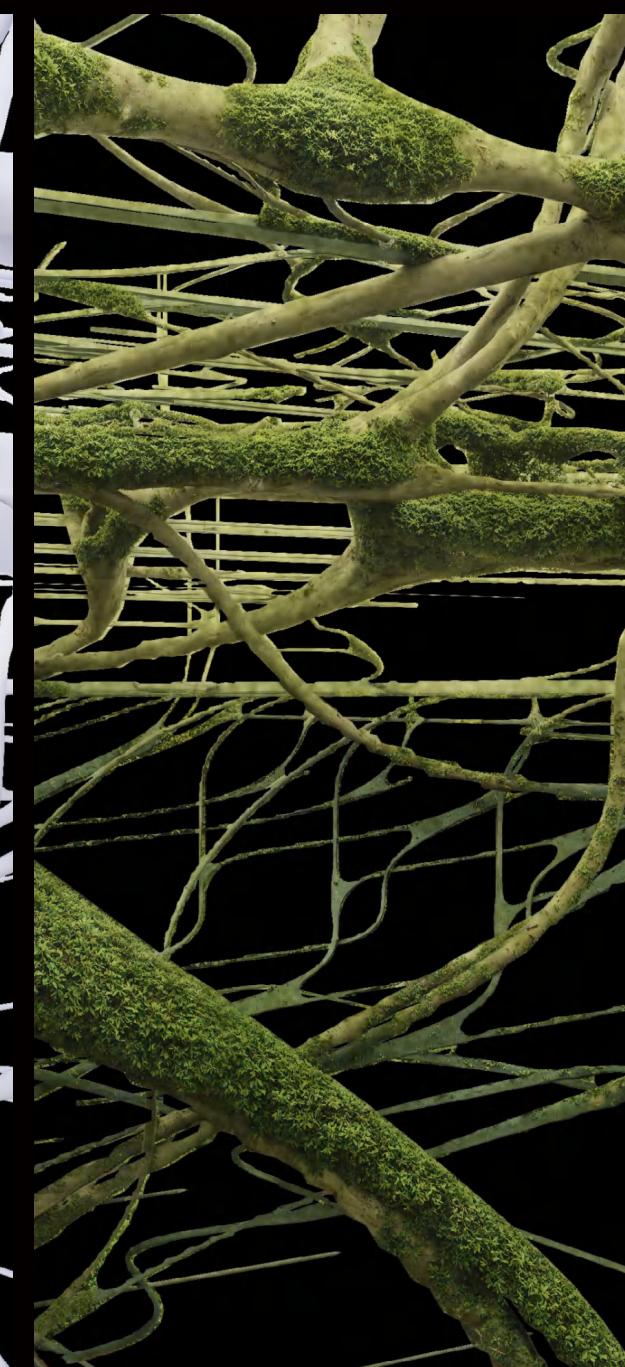


Parasitic Facade Design

3D PROCESS_ MESH AND CURVE COMBINATION









SKILL COURSE 2: HOUDINI //

MArch Urban Design RC 16
Student ID: 24075832
Tutor: Filippo Nassetti



//Settings:
AI tool: KLing AI;
Image Generation: Restlye;
Render Model: KOLORS 2.0

ABSTRACT



Source: Pinterest

// Tafoni Weathering Rock

Tafoni weathering, is a type of rock erosion that creates intricate, hole-ridden patterns resembling a honeycomb. This phenomenon occurs primarily in coastal and arid environments and is driven by a combination of physical and chemical weathering processes. Tafoni often occur in groups that can riddle a hillside, cliff, or other rock formation. They typically develop in siliceous, either coarse-grained (sandstone) or coarsely crystalline (granite), rock types. They also have been observed in lacustrine silts, tuffs, and conglomerates. They can be found in all climate types, but are most prolific in salt-rich environments, such as deserts and coastal zones.

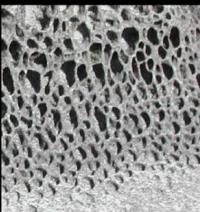


Source: Pinterest

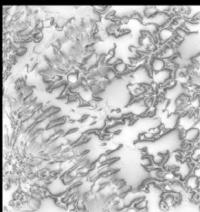
WORKFLOW



terrain reference



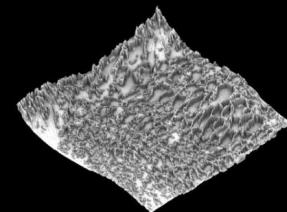
terrain reference



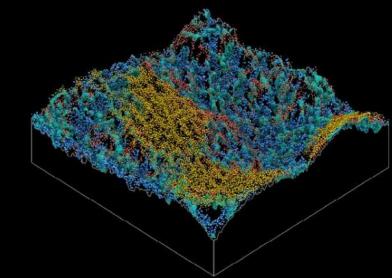
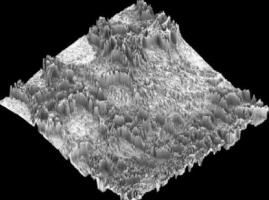
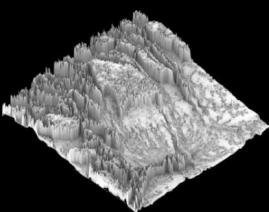
erode



top view

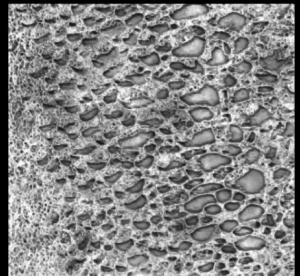


axial view



analysis

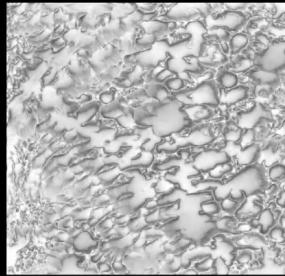
Input_01



Noise: Sparse Convolution

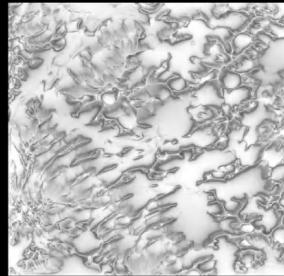
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Element size: 350
Max Octaves: 4
Lacunarity: 1.82
Roughness: 0.4

Hydro



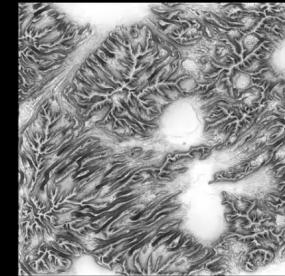
Erodability: 1
Erosion Rate: 0.4
Bank Angle: 15
Spread Iterations: 40

Hydro



Erodability: 1.5
Erosion Rate: 0.5
Bank Angle: 30
Spread Iterations: 60

Hydro



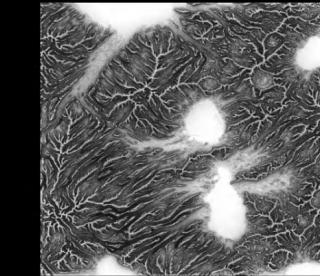
Erodability: 2
Erosion Rate: 0.6
Bank Angle: 60
Spread Iterations: 80

Hydro



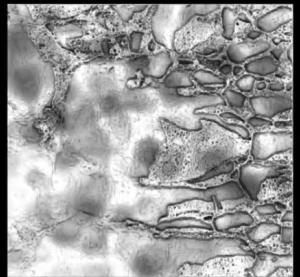
Erodability: 2
Erosion Rate: 0.4
Bank Angle: 60
Spread Iterations: 100

Hydro

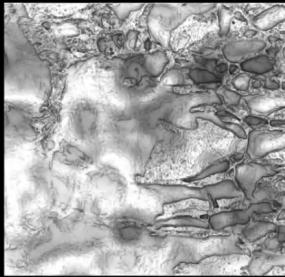


Erodability: 2.5
Erosion Rate: 0.7
Bank Angle: 65
Spread Iterations: 100

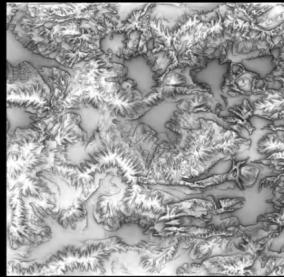
Input_02



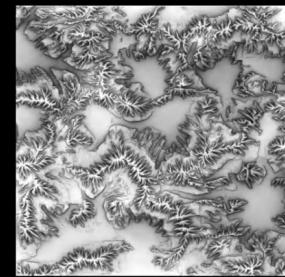
Noise: Perlin Flow
Amplitude: 780
Element size: 300
Max Octaves: 7
Lacunarity: 1.24
Roughness: 0.8



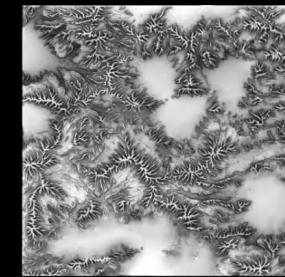
Erodability: 0.2
Erosion Rate: 0.4
Bank Angle: 10
Spread Iterations: 20



Erodability: 1.5
Erosion Rate: 0.8
Bank Angle: 20
Spread Iterations: 30



Erodability: 2
Erosion Rate: 0.9
Bank Angle: 40
Spread Iterations: 40

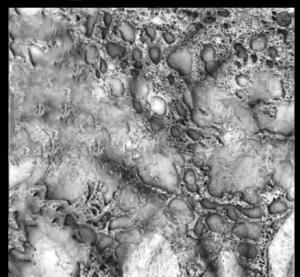


Erodability: 2
Erosion Rate: 0.8
Bank Angle: 45
Spread Iterations: 100

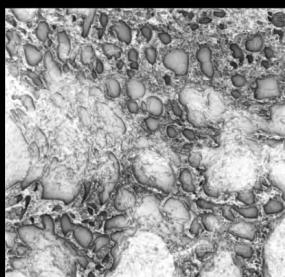


Erodability: 2.5
Erosion Rate: 0.7
Bank Angle: 65
Spread Iterations: 100

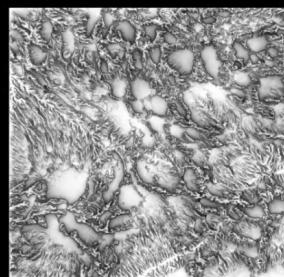
Input_03



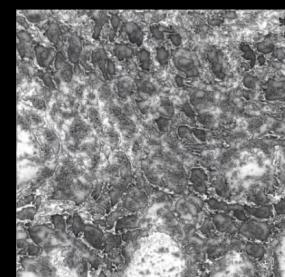
Noise: Perlin Flow
Amplitude: 780
Element size: 300
Max Octaves: 7
Lacunarity: 1.24
Roughness: 0.8



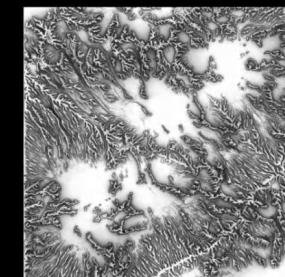
Erodability: 0.2
Erosion Rate: 0.2
Bank Angle: 20
Spread Iterations: 10



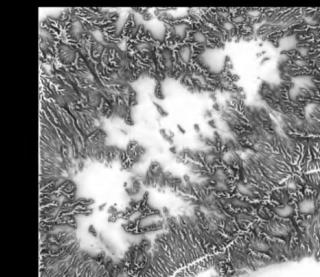
Erodability: 0.6
Erosion Rate: 0.8
Bank Angle: 40
Spread Iterations: 40



Erodability: 0.5
Erosion Rate: 0.8
Bank Angle: 20
Spread Iterations: 15

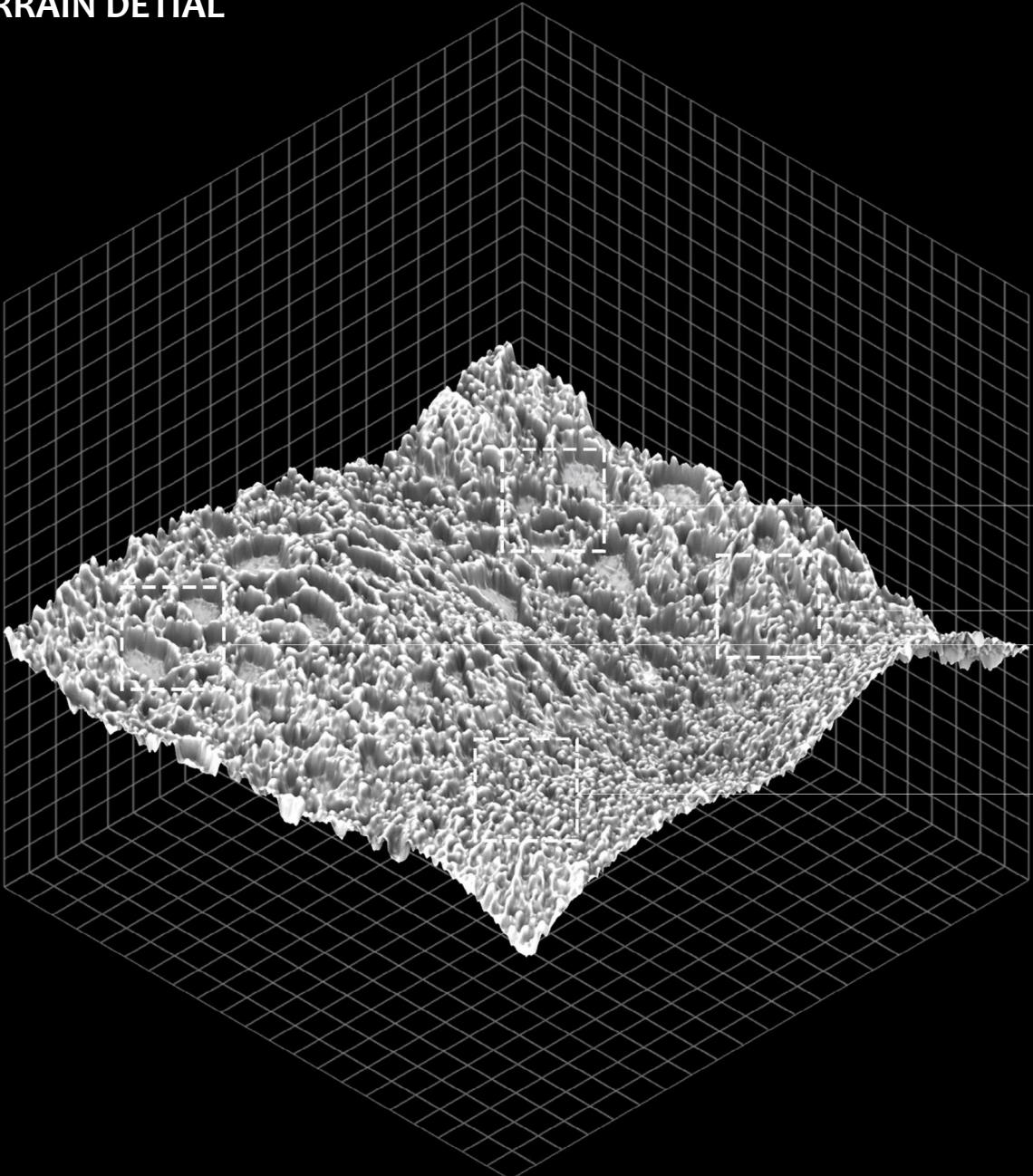


Erodability: 2.5
Erosion Rate: 0.7
Bank Angle: 65
Spread Iterations: 100



Erodability: 2.5
Erosion Rate: 0.7
Bank Angle: 70
Spread Iterations: 120

TERRAIN DETIAL



Pattern_01

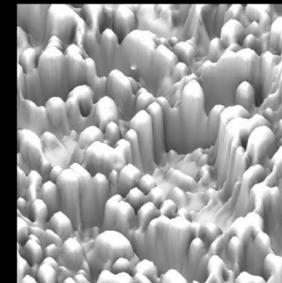
Pattern_02

Pattern_03

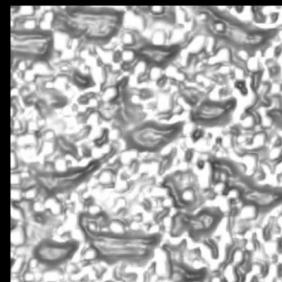
Pattern_04



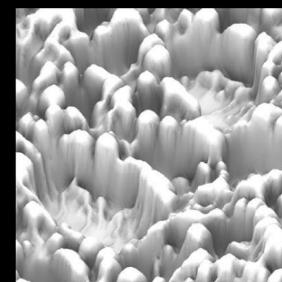
Pattern_01_TopView



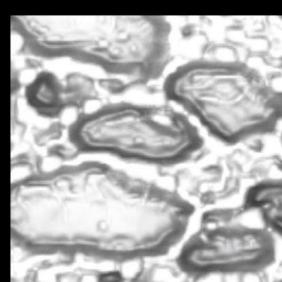
Perspective View



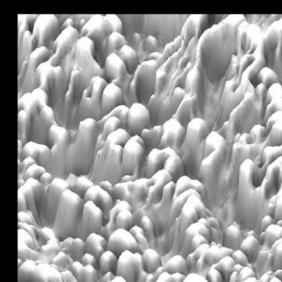
Pattern_02_TopView



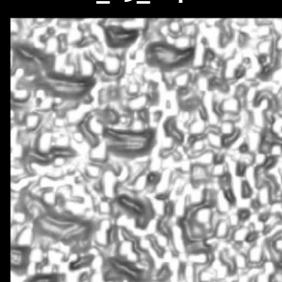
Perspective View



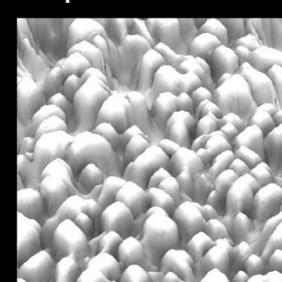
Pattern_03_TopView



Perspective View

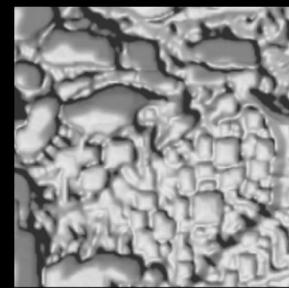
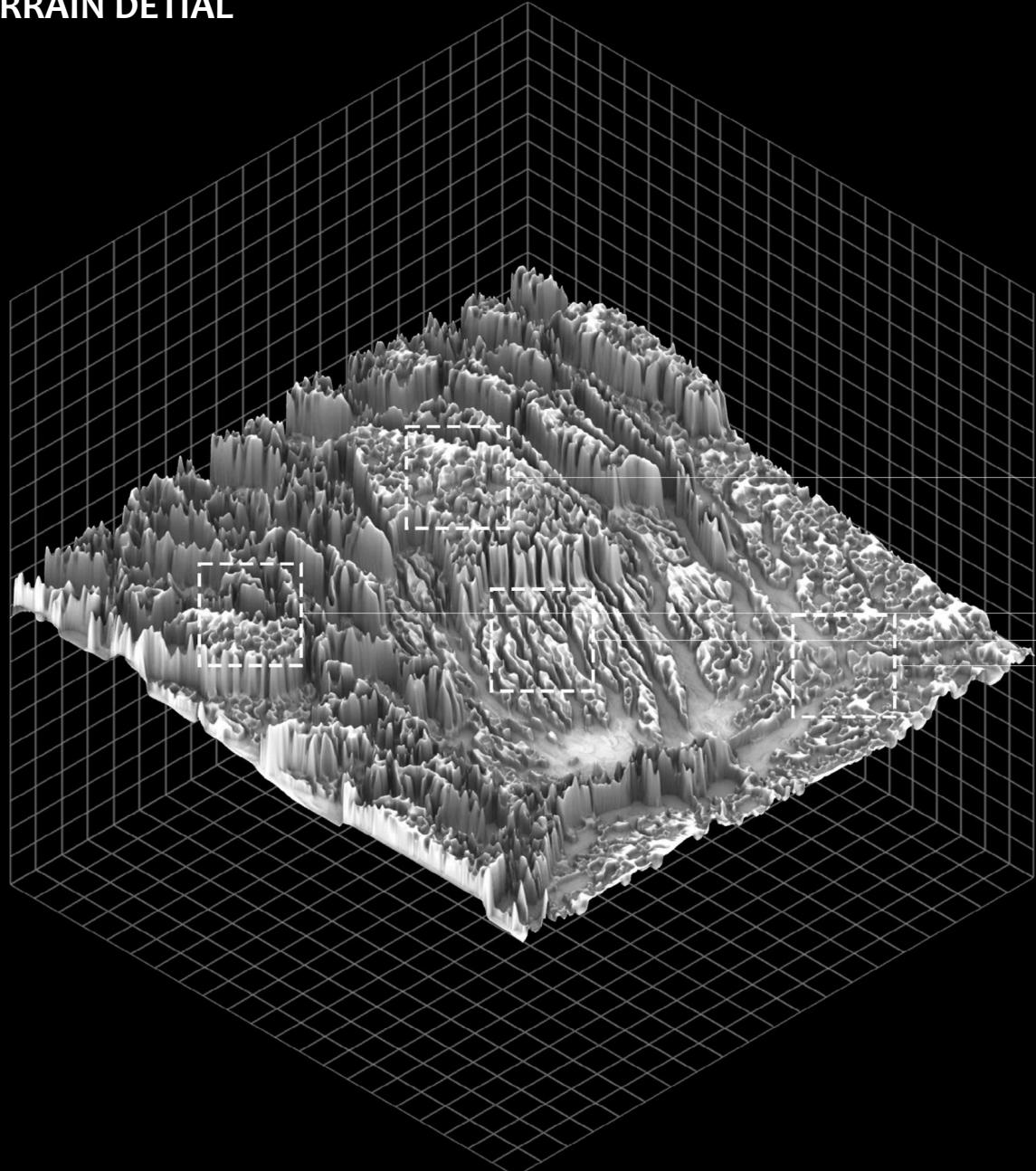


Pattern_04_TopView

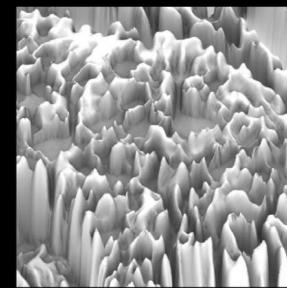


Perspective View

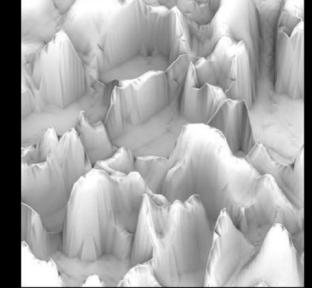
TERRAIN DETIAL



Pattern_01_TopView



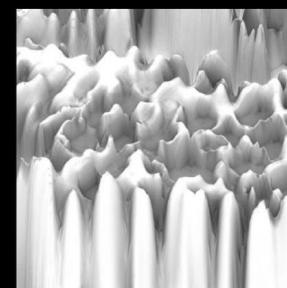
Perspective View



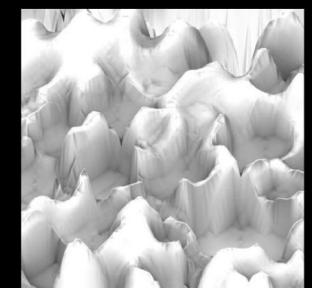
Perspective View



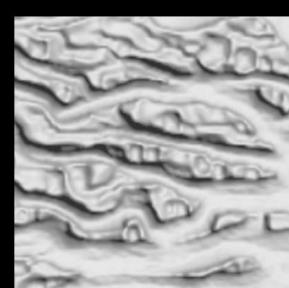
Pattern_02_TopView



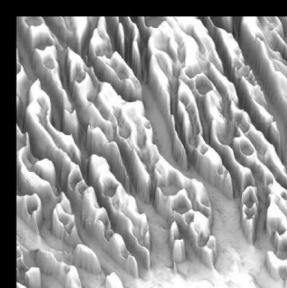
Perspective View



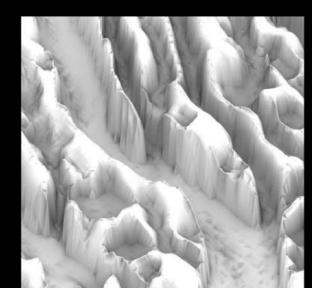
Perspective View



Pattern_03_TopView



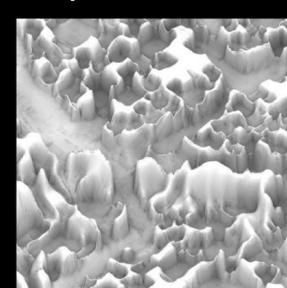
Perspective View



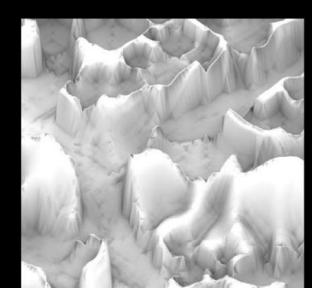
Perspective View



Pattern_04_TopView

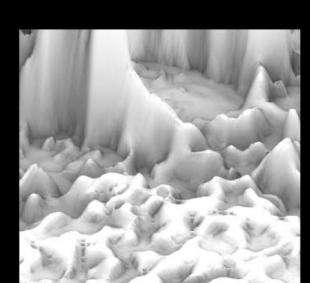
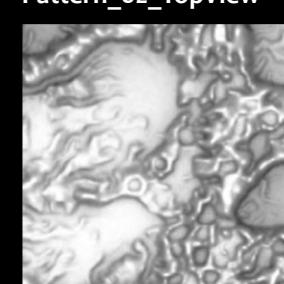
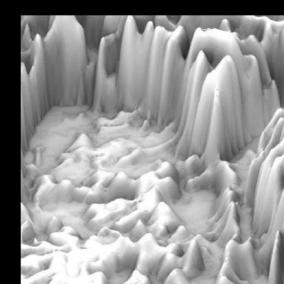
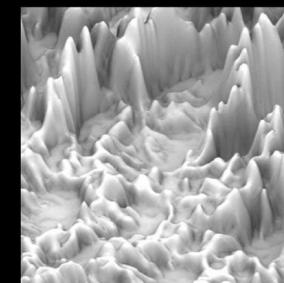
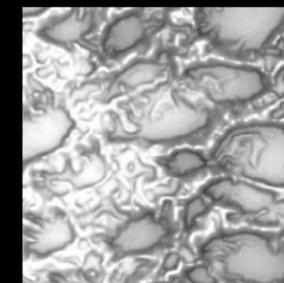
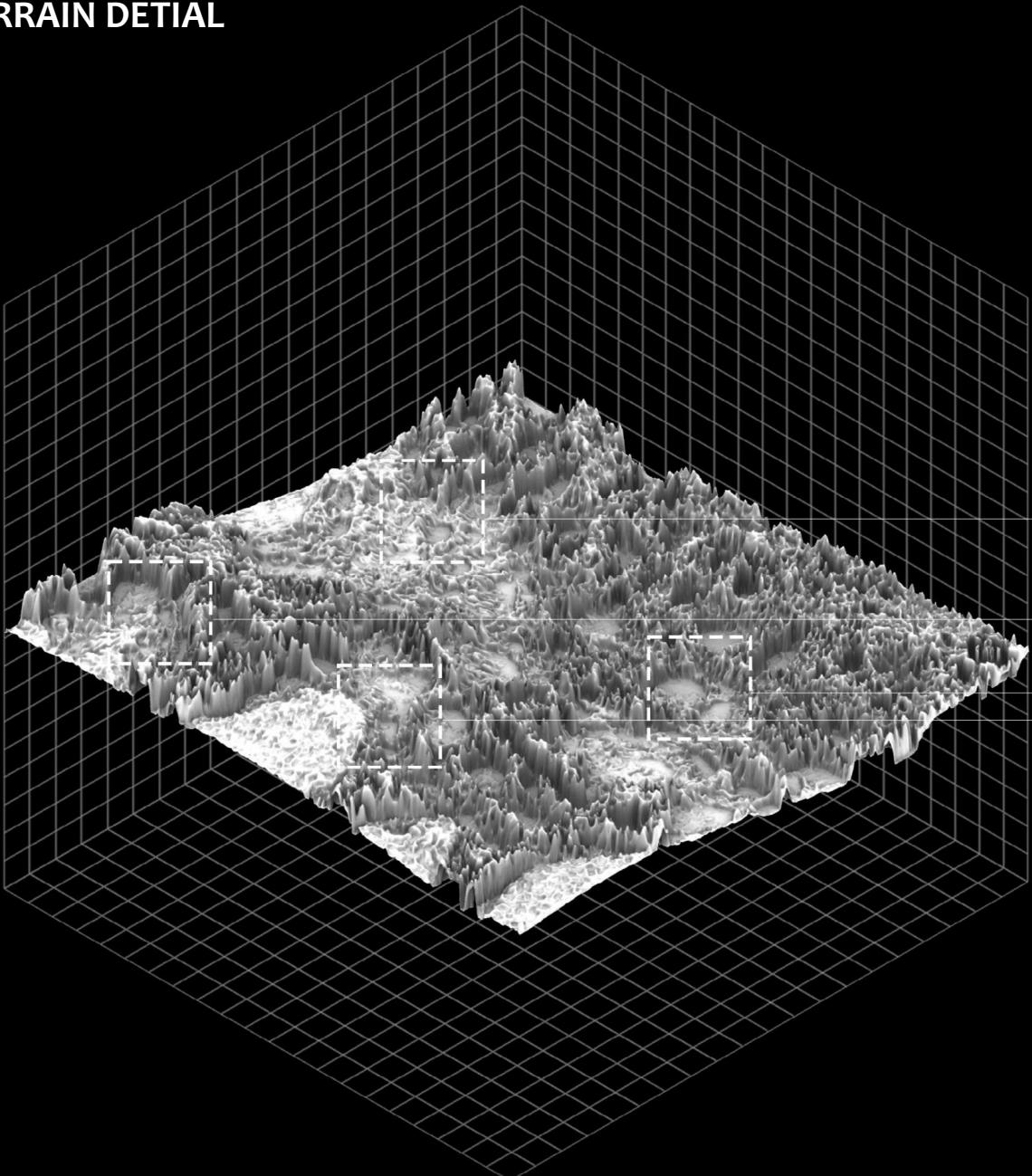


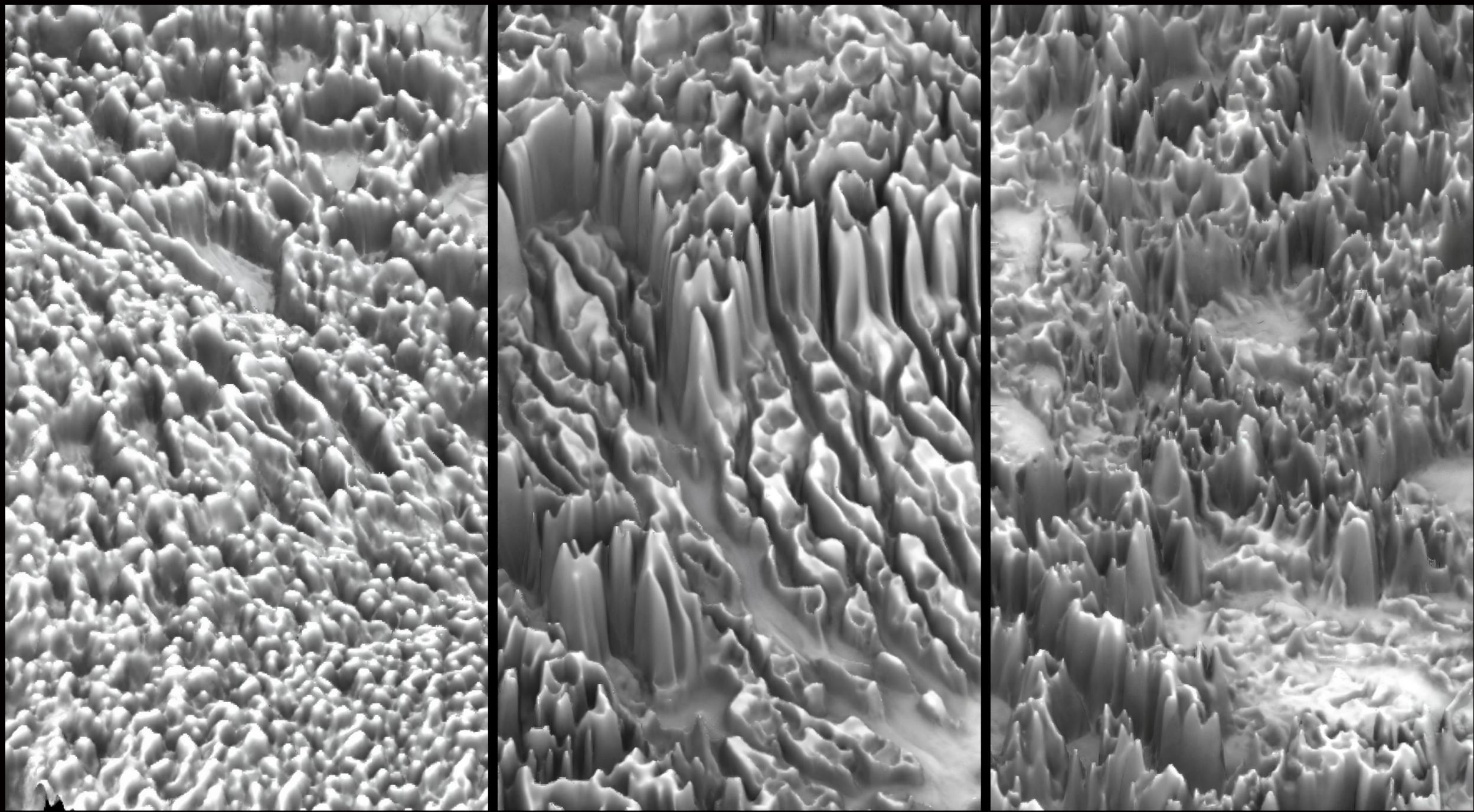
Perspective View

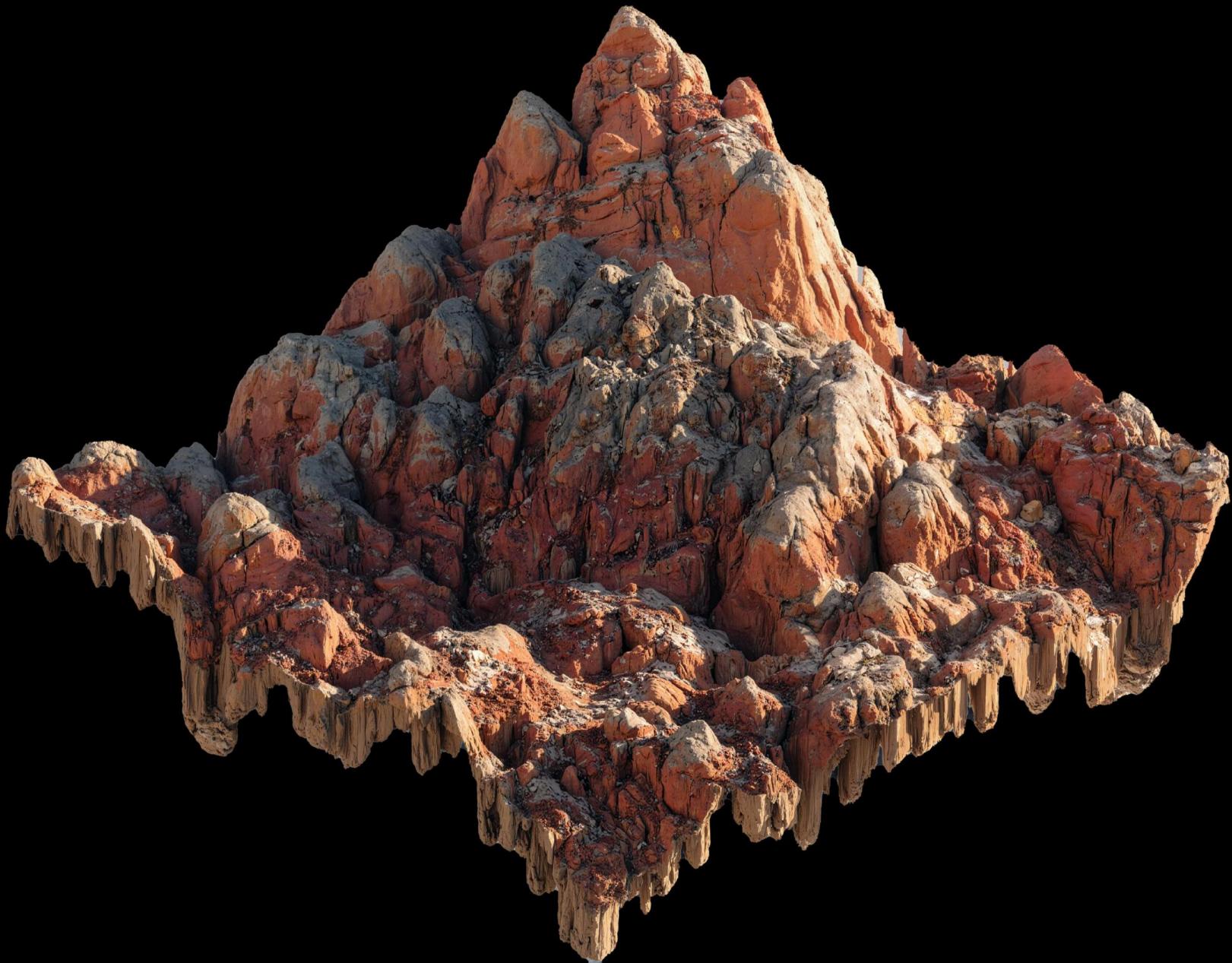


Perspective View

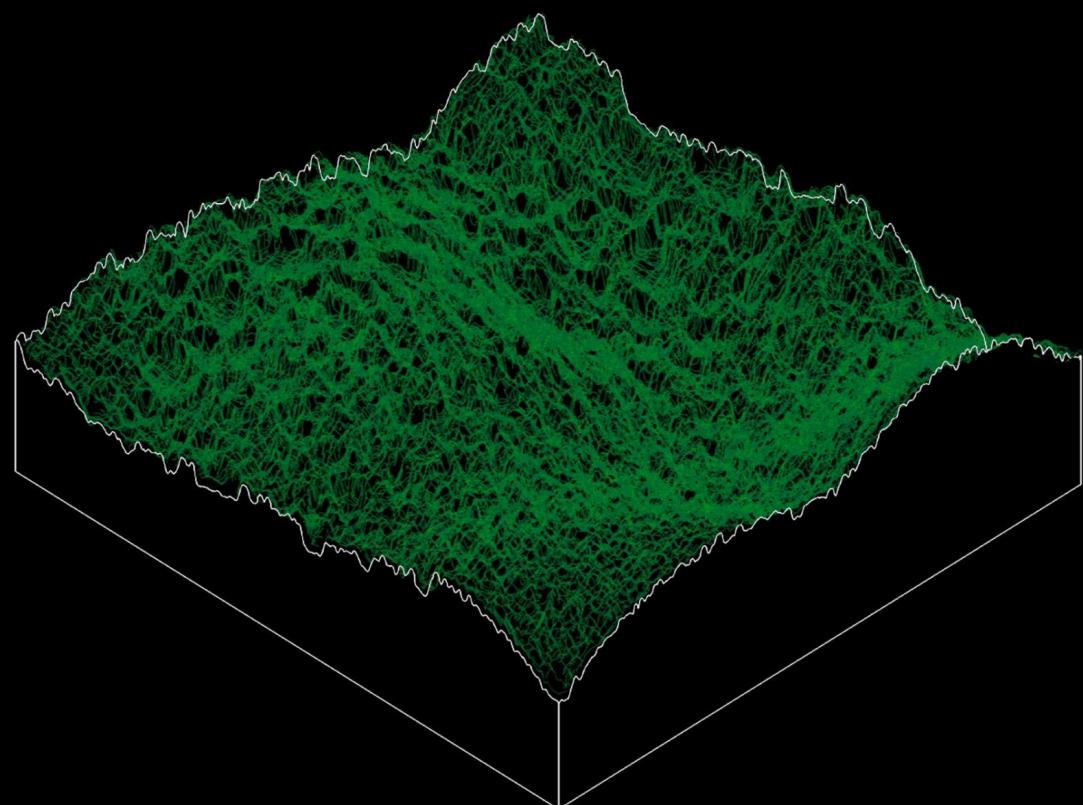
TERRAIN DETIAL



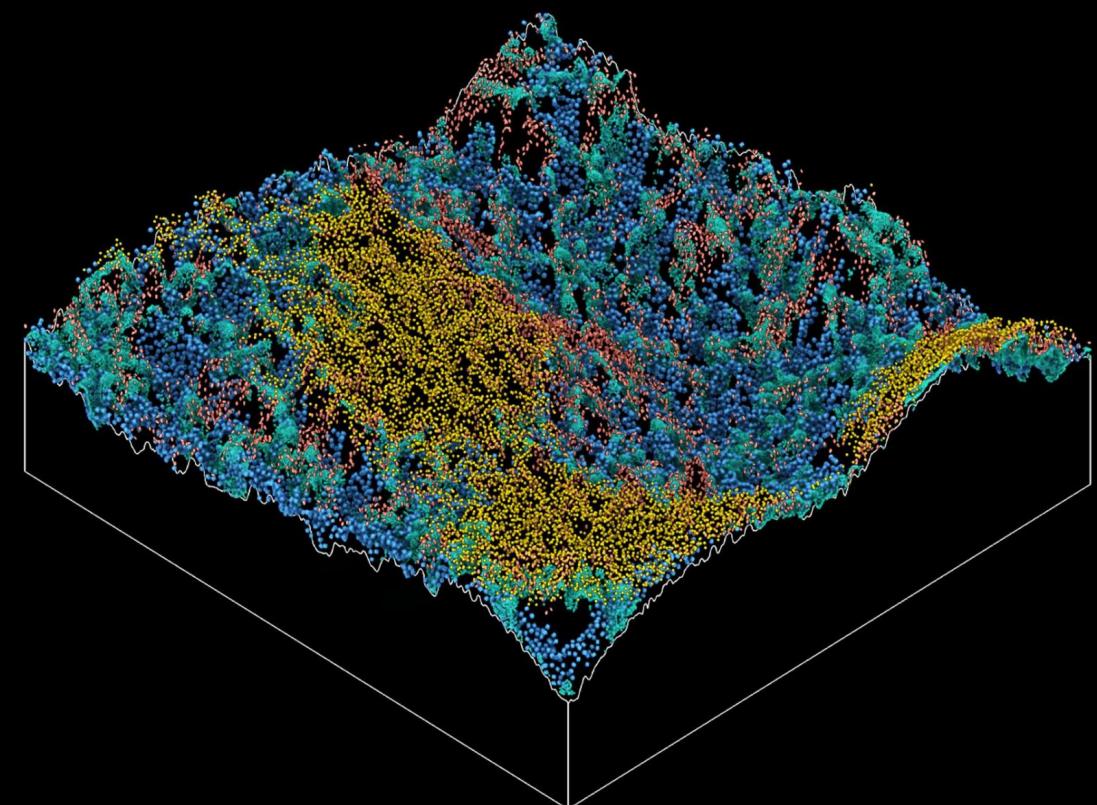




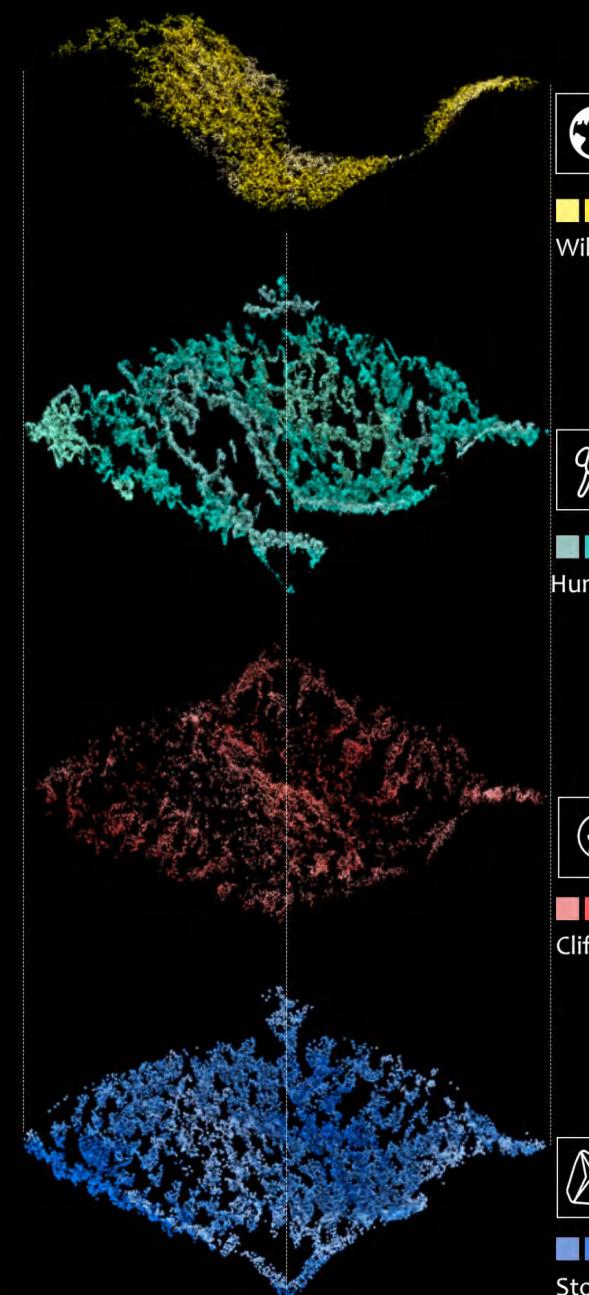
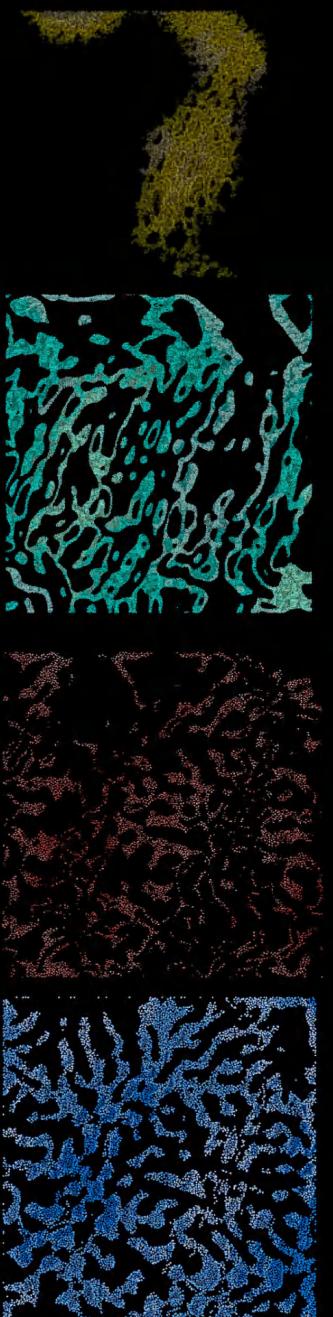
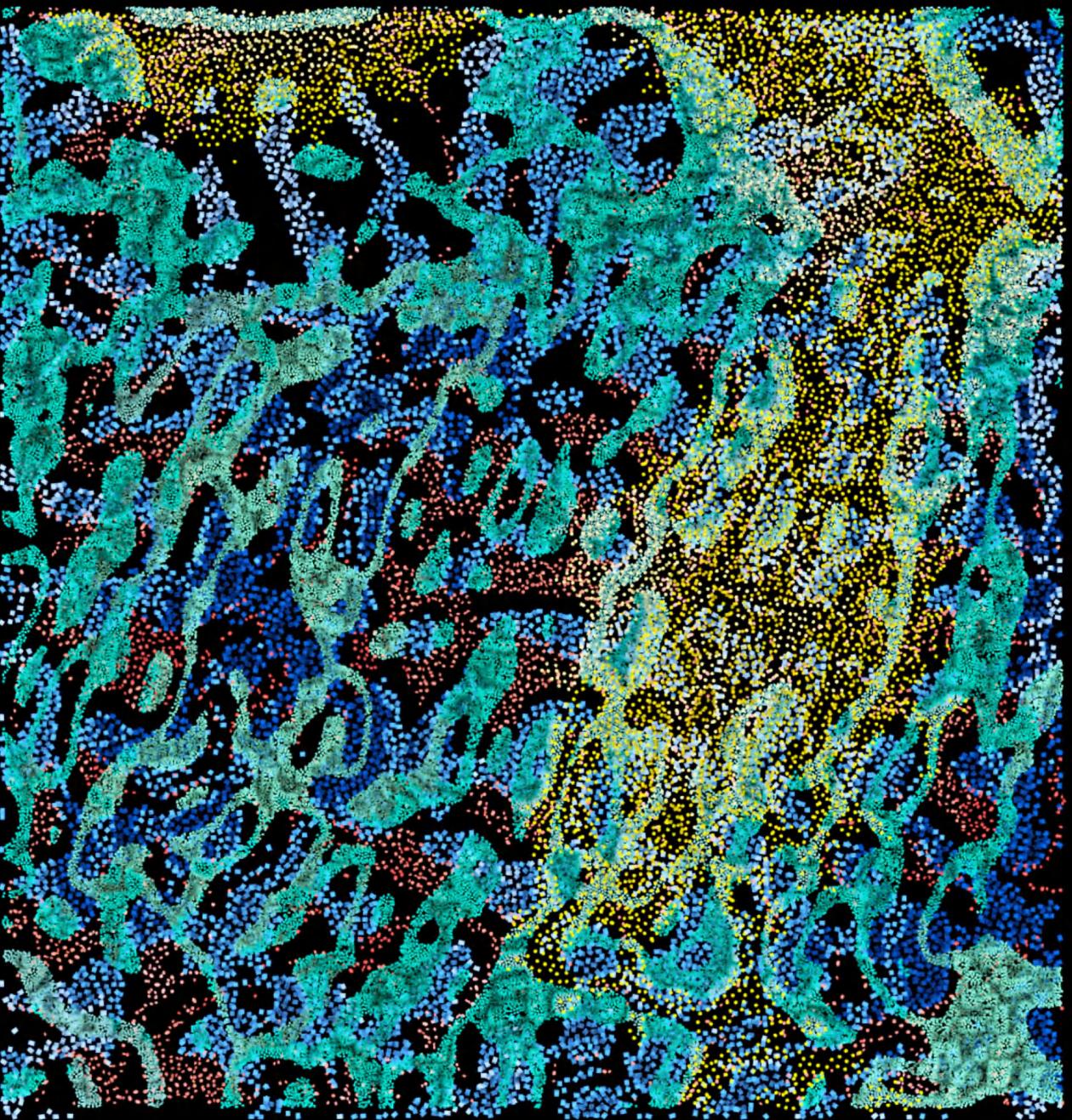
SCATTERING



Shortest Walk



Human and Nature Distribution



Wildlife Reserve



Human Activities

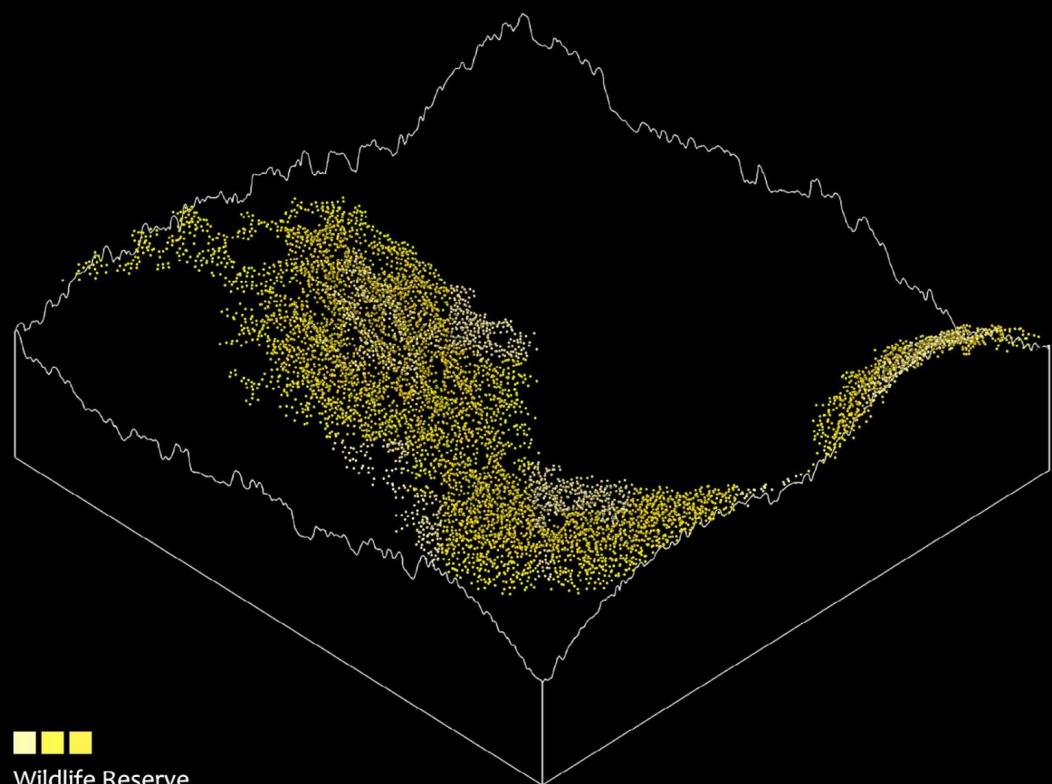


Cliff



Stone Forest

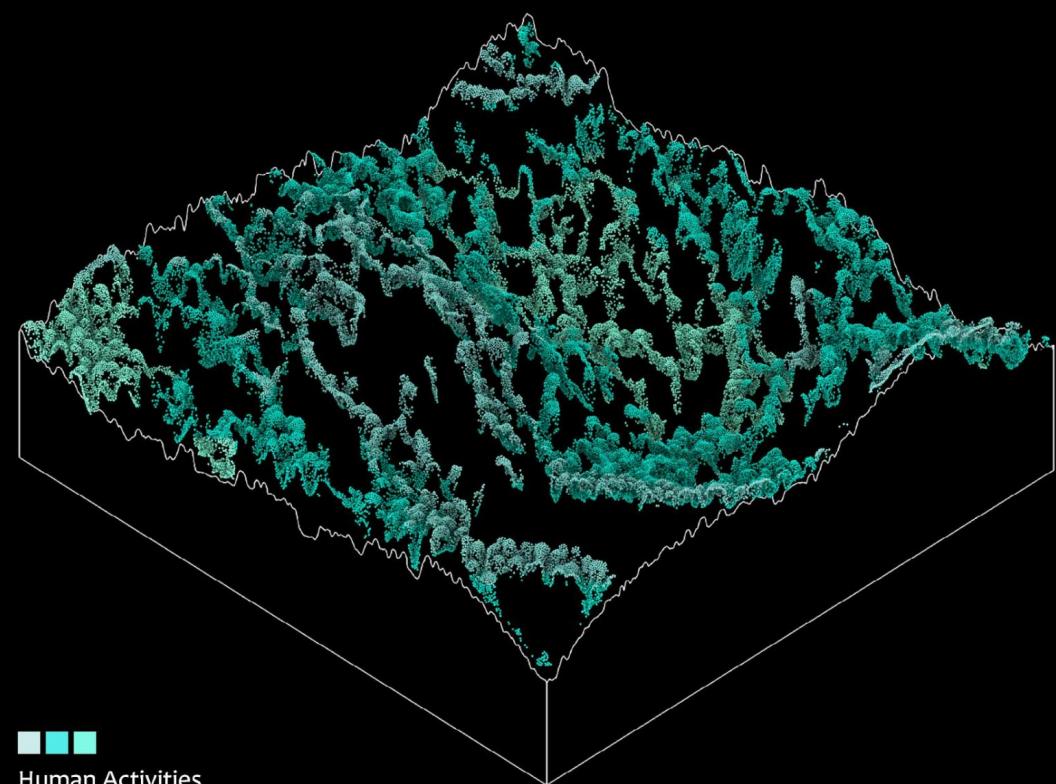
SCATTERING



■ ■ ■
Wildlife Reserve



Insect Reptile Birds

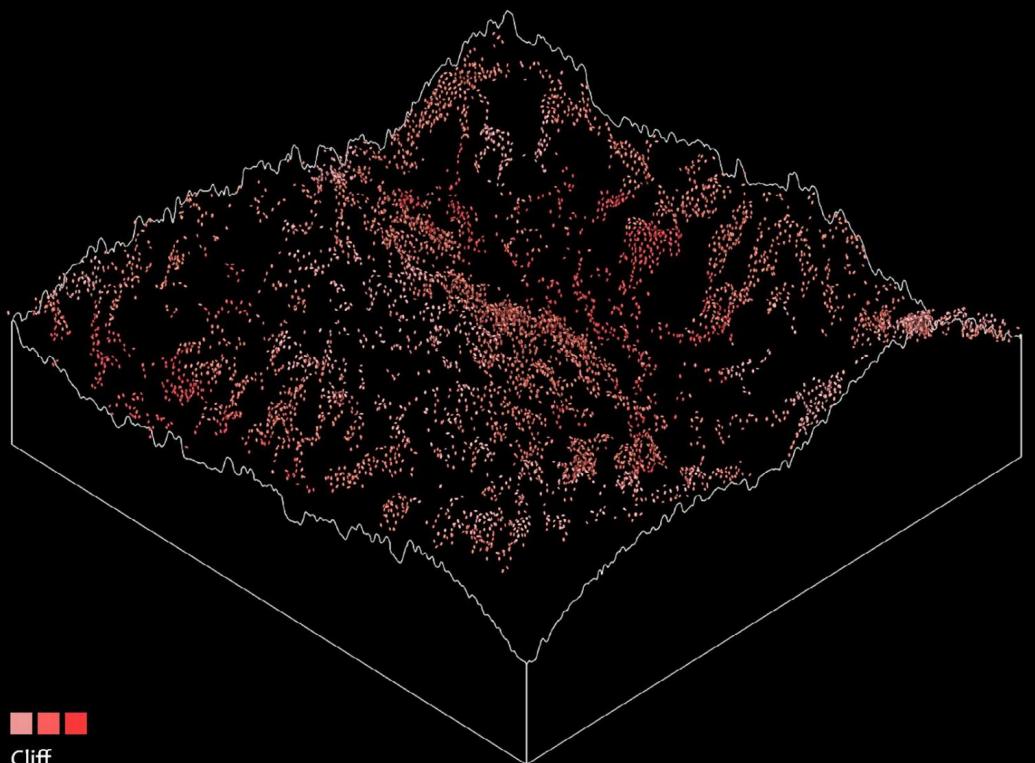


■ ■ ■
Human Activities

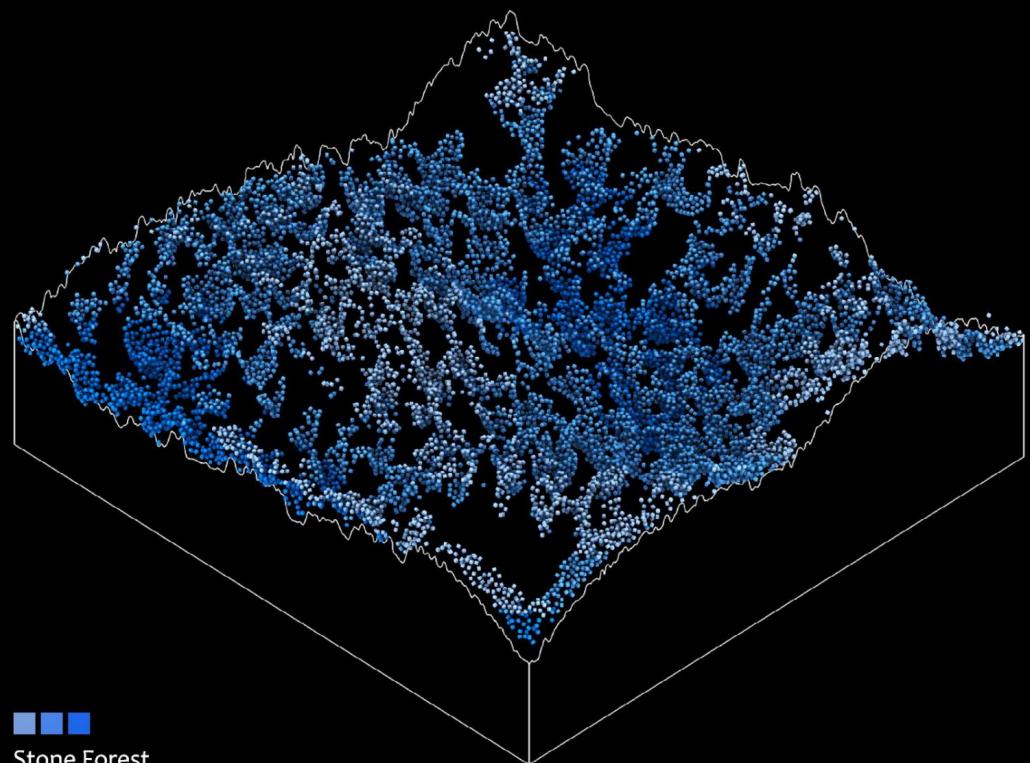
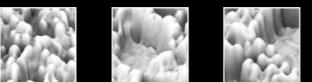


Hiking Skating Climbing

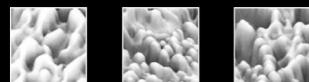
SCATTERING



Cliff



Stone Forest





//Prompt:

A highly realistic depiction of honeycomb-weathered rock formations with deeply eroded surfaces, showcasing intricate porous textures and jagged edges, surrounded by scattered weathered stones and coarse gravel partially covered by vibrant green moss clusters under soft natural daylight, rendered with sharp geological details and earthy tonal variations to emphasize the rugged beauty of natural erosion processes. Low-angle bird 's-eye view, at the seaside.

//Settings:

AI tool: KLing AI; Image Generation: Restlye; Render Model: KOLORS 2.0



//Prompt:

A highly realistic depiction of honeycomb-weathered rock formations with deeply eroded surfaces, showcasing intricate porous textures and jagged edges, surrounded by scattered weathered stones and coarse gravel partially covered by vibrant green moss clusters under soft natural daylight, rendered with sharp geological details and earthy tonal variations to emphasize the rugged beauty of natural erosion processes. Low-angle bird's-eye view, at the seaside, perspective view, detailed.

//Settings:

AI tool: KLing AI; Image Generation: Restlye; Render Model: KOLORS 2.0

SKILL COURSE 3: AI+DESIGN //

MArch Urban Design RC 16

Student ID : 24075832

Tutor: Shengyu Meng



AI-GENERATED URBAN PROTOTYPE SECTION // 01

Real satellite has been used as prototypes, with parameters systematically adjusted to simulate the temporal dynamics of urban expansion and its impact on green space distribution.



denoise 0.30

denoise: 0.60

denoise: 0.70



denoise: 0.80



denoise: 0.85



denoise: 0.88

Cities are constantly expanding and there are more and more tall buildings, but the expansion of traditional cemeteries will undoubtedly take up a lot of urban resources. The existing solution is to form cemetery gardens to accommodate more human activity. This page uses AI imagery to generate a timeline of the cemetery's expansion across the city.

Prompt: google map, city satellite, earth view, petri dish view, lichen,moss, urban texture, clearer builfings,Preserved network,high quaility, hyperdetailed, 8k, more green space

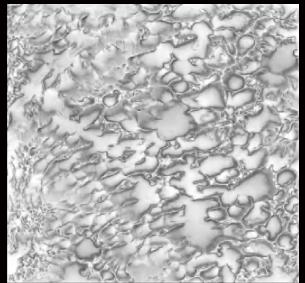
Ckpt_name: architectureExterior_v40Exterior.safetensors

Seed: 134366142392534; Control_after_generate: fixed; Steps: 25; Cfg: 8.0; Sampler_name: dpmpp_2m; Scheduler: normal



AI-GENERATED URBAN PROTOTYPE SECTION // 02_MIXED MATERIALS

input_01



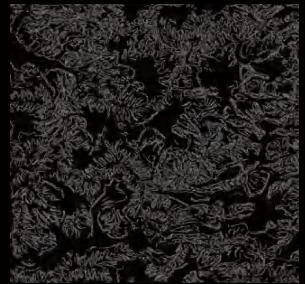
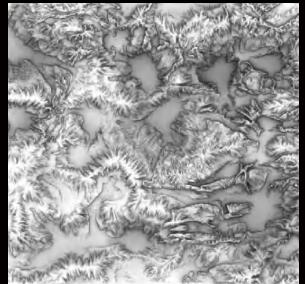
style



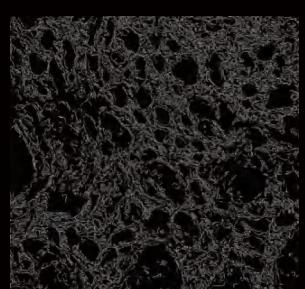
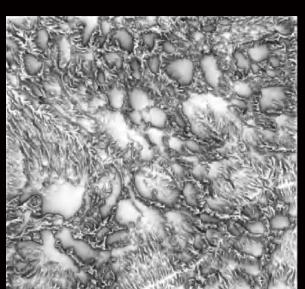
stable diffusion output



input_02



input_03

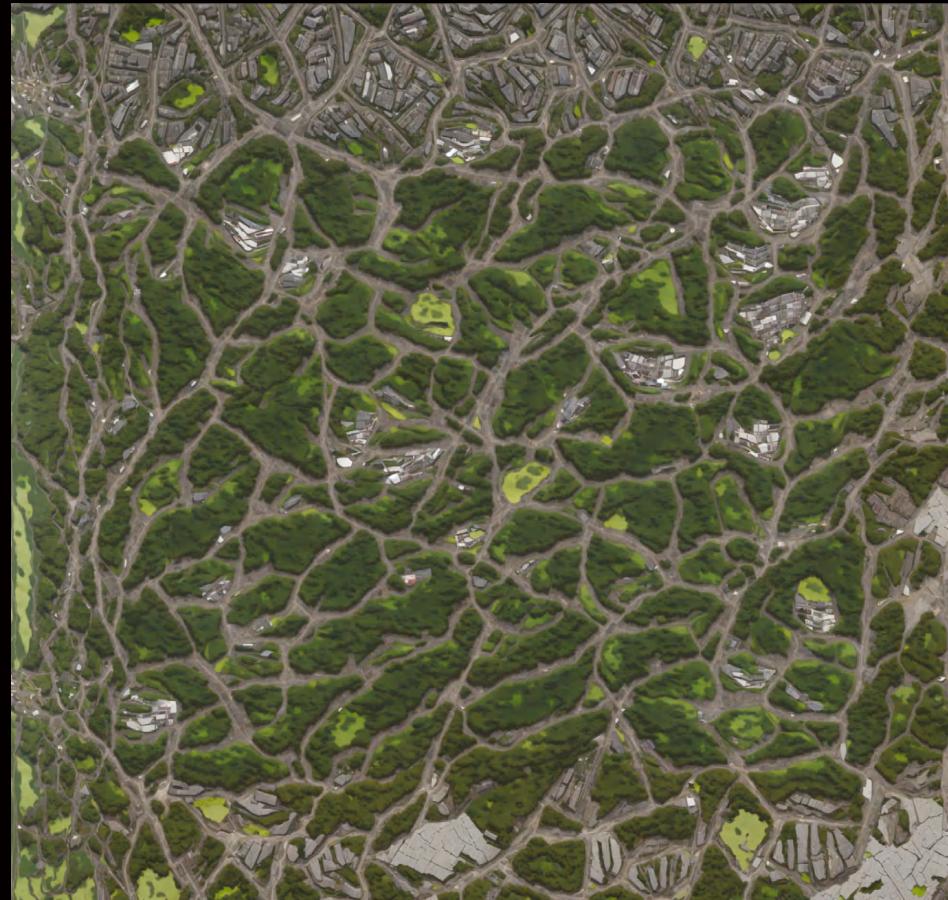
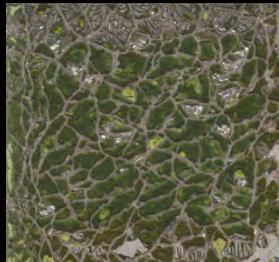
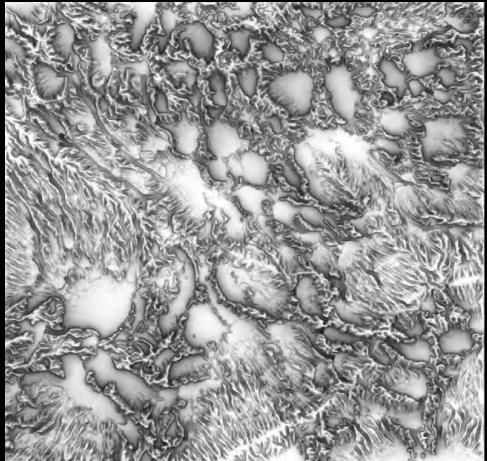


prompt:satellite view of a biological sustainable energy city, top view, urban planning, cemetery garden
steps: 45; cfg: 12.0; sampler: dpmpp_2m; scheduler: karras; denoise: 1.0; model: SD1.5\dreamshaper_8; strength: 1.0;
seed: 70134457718214; 1024x1024

prompt:maximalism Micro bio city in pattern of (honey weathering structures_1.05) with
overgrow buidings, Photomicrography, satellite maps, google map
steps: 30; sampler: dpmpp_2m; scheduler: karras; model: Juggernaut; cfg: 8.0; denoise: 0.4;
2000x2000

AI-GENERATED URBAN PROTOTYPE SECTION // 02_MIXED MATERIALS

style



input_01



2048X2048

prompt:satellite view of a biological sustainable energy city, top view, urban planning, cemetery garden
steps: 45; sampler: dpmpp_2m; scheduler: karras; model: SD1.5\dreamshaper_8; strength: 1.0; seed: randomize; 1024x1024

This design integrates honeycomb weathering principles into urban and cemetery planning, creating a porous spatial network that blends natural and built environments. The layout enhances connectivity, ecological functions, and non-human perceptual spatial organization.

AI-GENERATED URBAN PROTOTYPE SECTION // o2_MIXED MATERIALS



group 1

group 2



group 3

group 4



group 5

group 6

According to the AI-generated city map and the migration of different geomorphic styles, the adaptation of the scheme was tested. The city satellite map input prediction is the original image, and the different landform styles are the style transfer objects; denoise: 0.80

c2-ipadaptor

steps: 45; sampler: dpmpp_2m; scheduler: karras; model: SD1.5\dreamshaper_8; strength: 1.0

AI-GENERATED URBAN PROTOTYPE SECTION // 02_MIXED MATERIALS

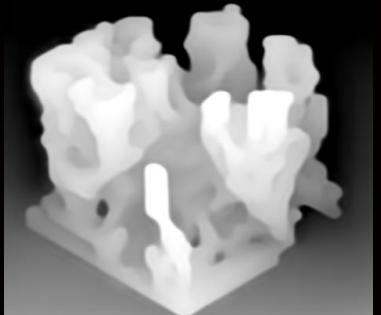
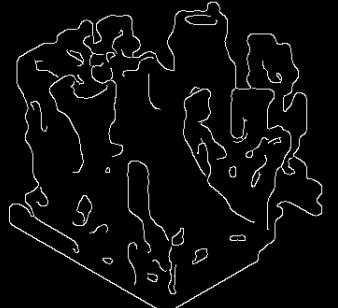
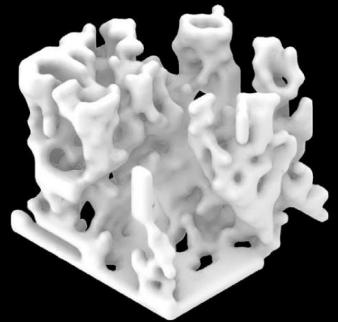


prompt:maximalism Micro bio city in pattern of (honey weathering structures_1.05) with overgrow buidings, Photomicrography, satellite maps, google map
steps: 30; sampler: dpmpp_2m; scheduler: karras; model: SDXL|turbovisionxlSuperFastXLBasedOn New; cfg: 6.0; denoise: 0.5; 2000x2000



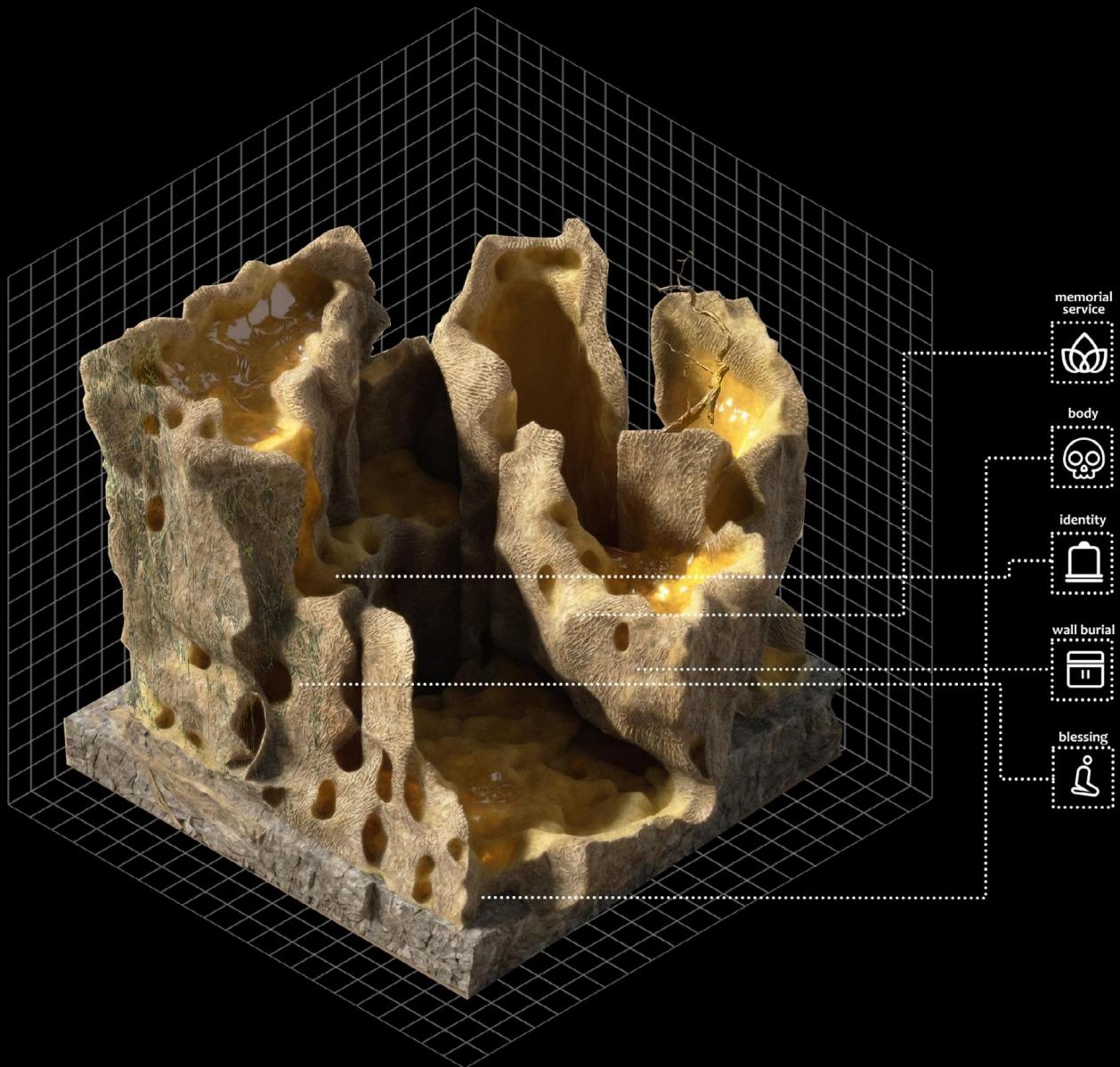
prompt:maximalism Micro bio city in pattern of (honey weathering structures_1.05) with overgrow buidings, Photomicrography, satellite maps, google map
steps: 30; sampler: dpmpp_2m; scheduler: karras; model: SDXL|turbovisionxlSuperFastXLBasedOn New; cfg: 6.0; denoise: 0.5; 2000x2000

AI-Generated Architectural Prototype Section // 01_AI TEXTURE



prompt:8m*8m*8m,constrcture, honey weathering textures,rock and luffa material, over growded,human activeties, landscape rendering, realistic.8K, HD
steps: 30; sampler: dpmpp_2m; scheduler: karras; model: sd1.5\xsmerge_v31IN; cfg: 8.0;
denoise: 1.0; 2000x2000

AI-Generated Architectural Prototype Section // o2_AI 3D MODEL



prompt:zoom in , more details, keep same material and sturcture, realistic.8K, HD
steps: 30; sampler: dpmpp_2m; scheduler: karras; model: sd1.5\xsmerge_v31IN; cfg: 8.0; denoise: 1.0; 2000x2000

AI-Generated Architectural Prototype Section // o2_Ai 3D MODEL



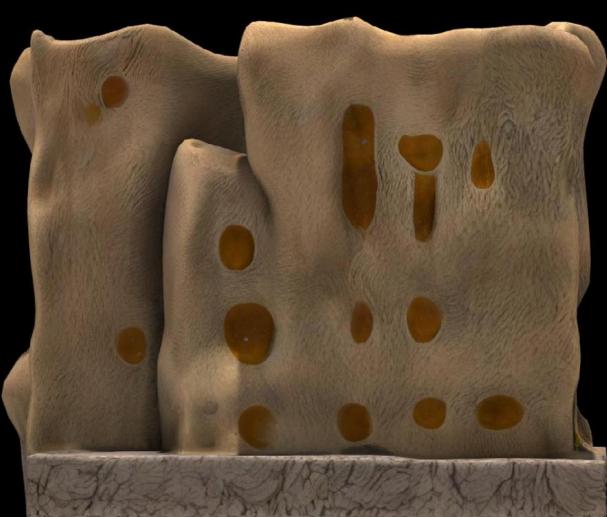
Axis view_Tripo3D



Rhino_Mesh



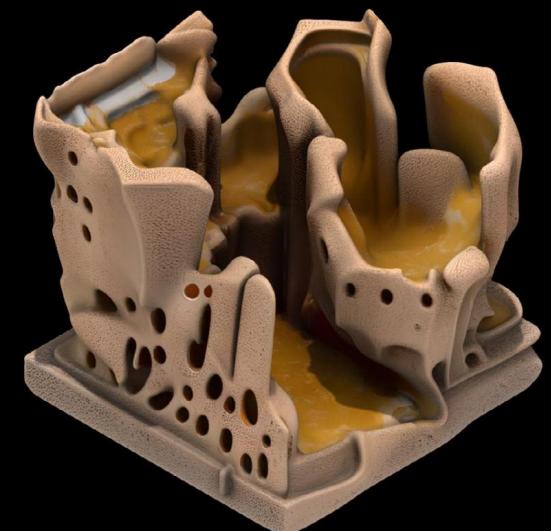
Axis view_Tripo3D



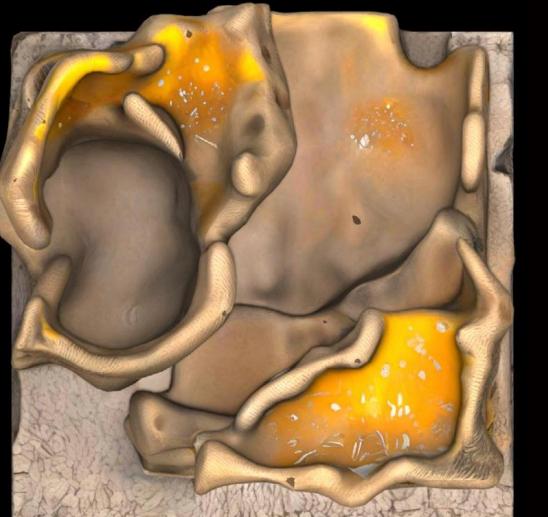
Elevation view



Axis view_ZoeDepth



Axis view_Hunyuan

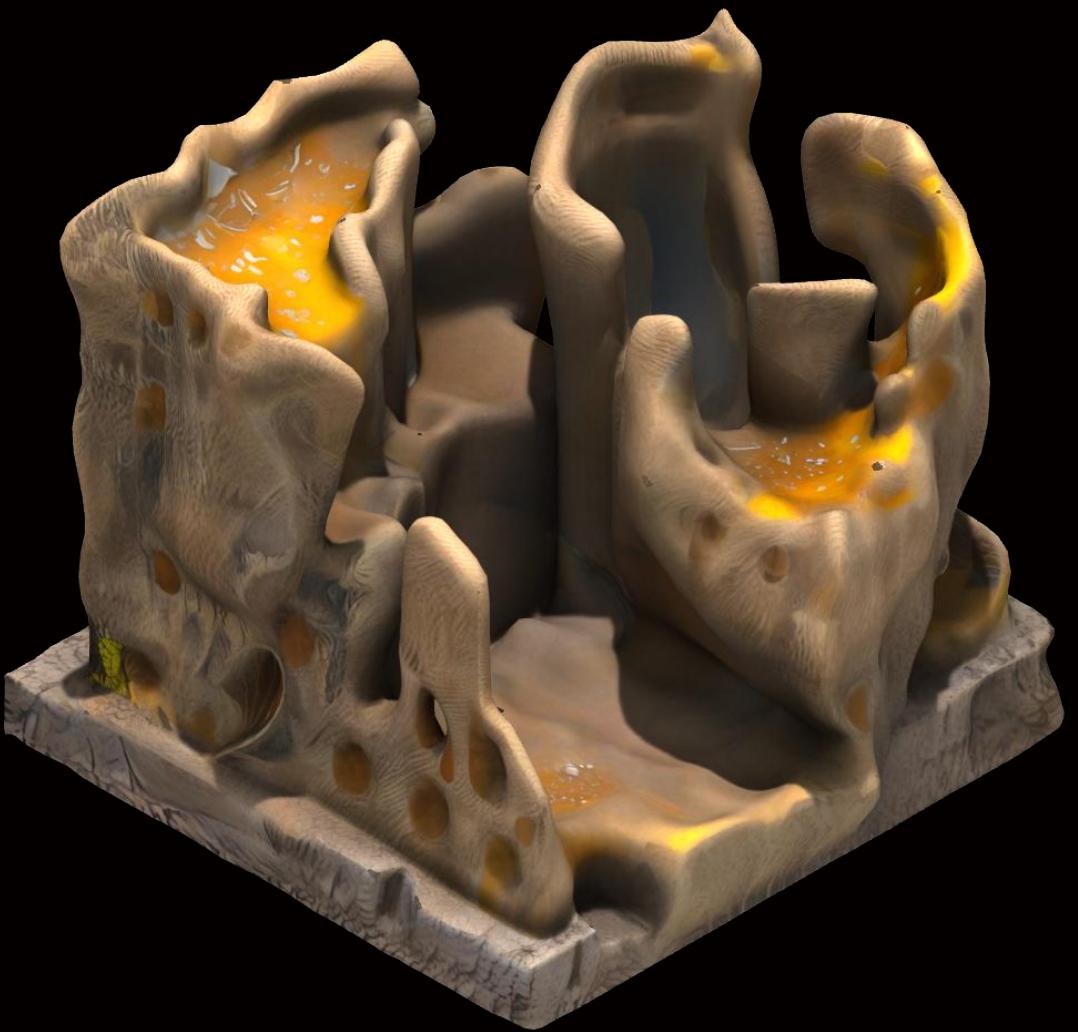


Top view

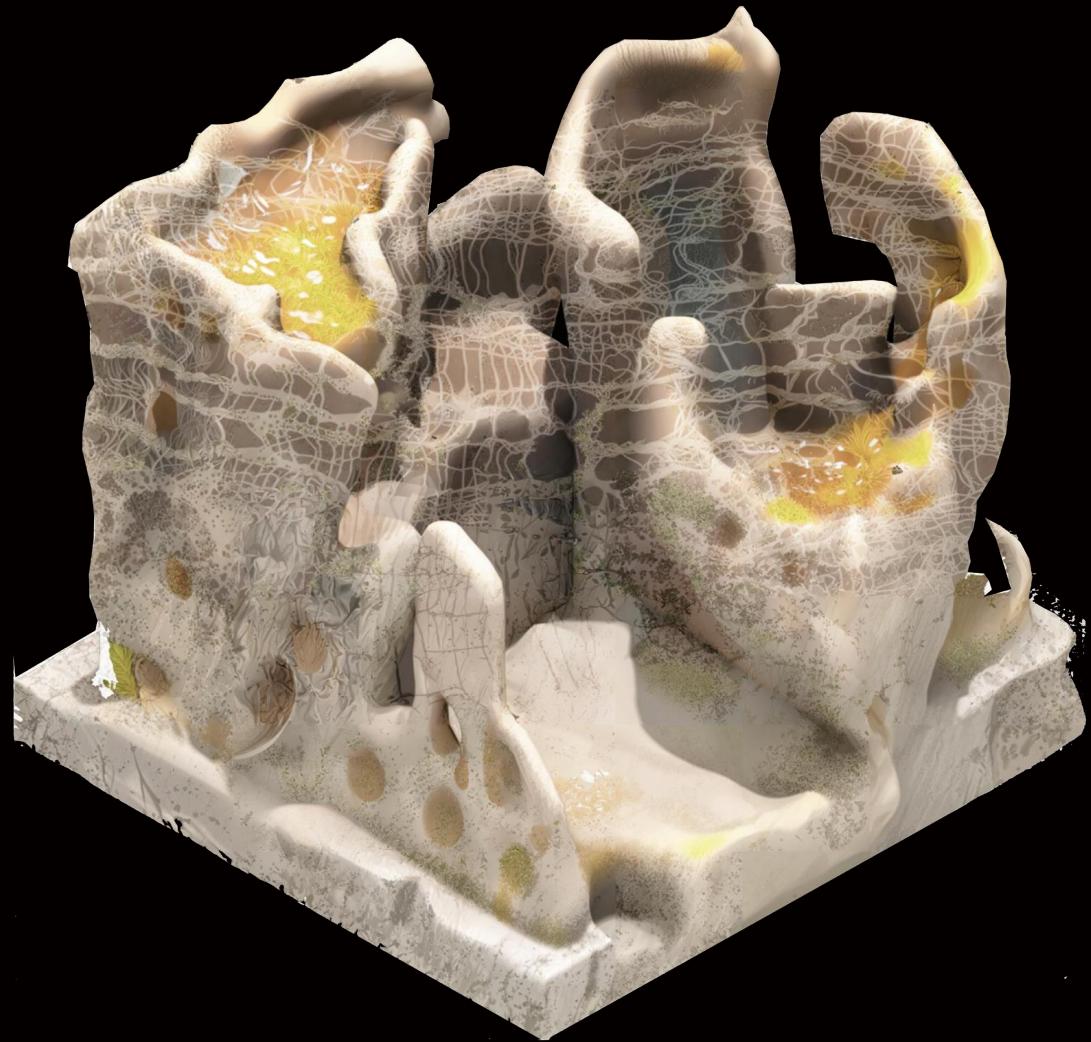


Elevation view

AI-Generated Architectural Prototype Section // o2_AI 3D MODEL

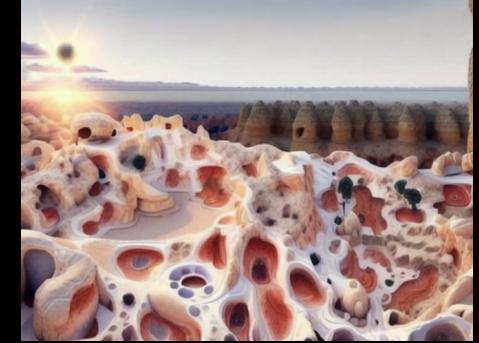
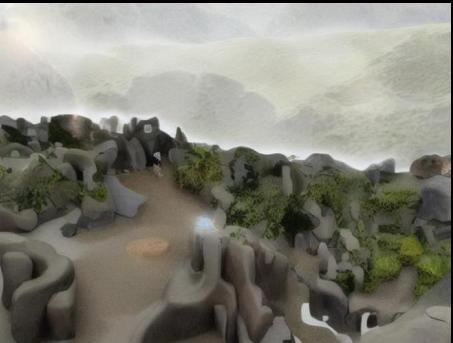


prompt:8m*8m*8m,constrcture, honey weathering textures,rock material, over growed,human activieties, landscape rendering, realistic,8K, HD, No self-luminescence
<https://www.trip03d.ai/app/home>, mesh in Rhino



prompt:8m*8m*8m,constrcture, more plants ; upscale
steps: 30; sampler: dpmpp_2m; scheduler: karras; model: sd1.5\xsmerge_v31IN; cfg: 8.0; denoise: 1.0;
2000x2000

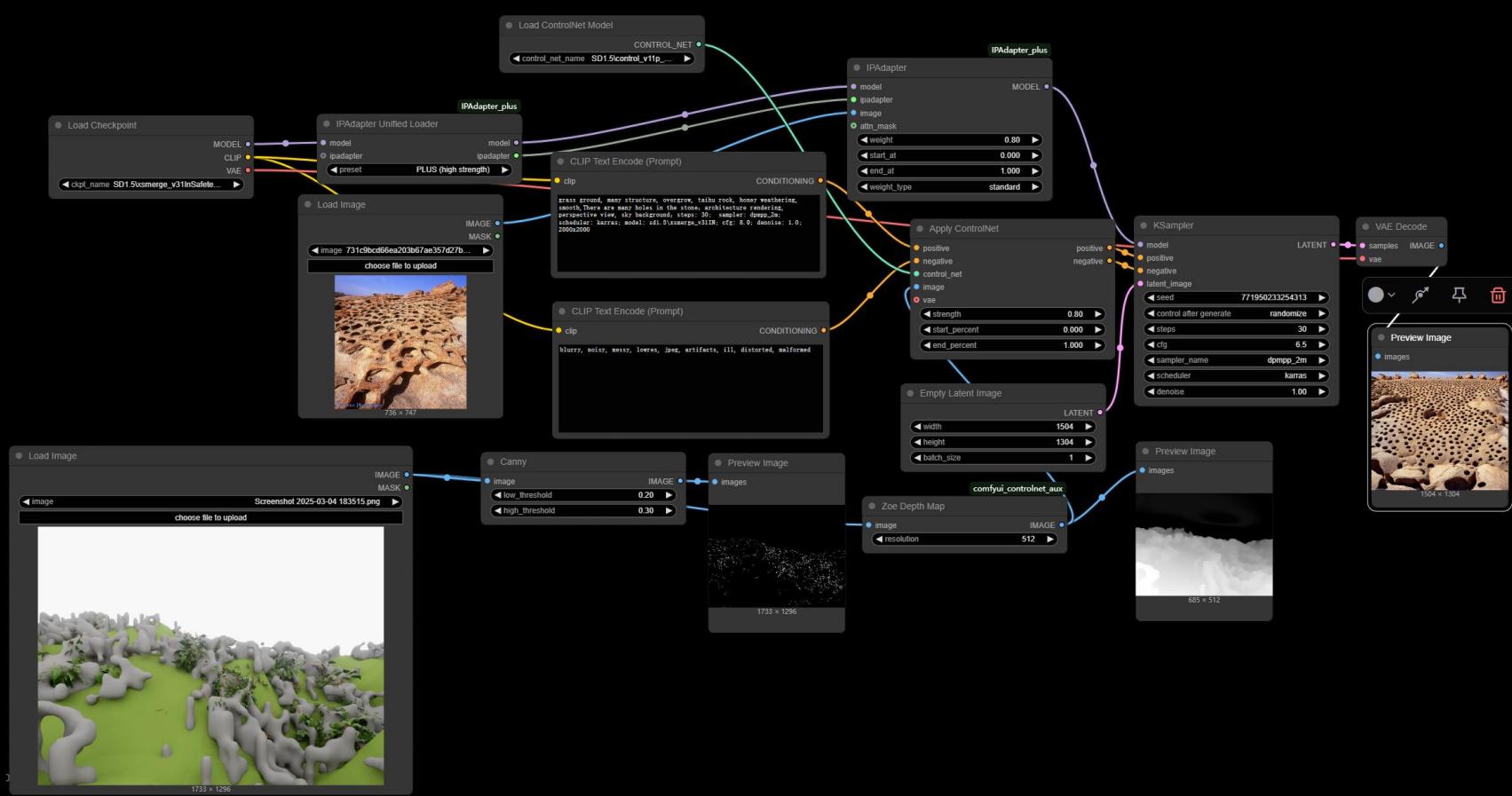
AI-Generated Architectural Prototype Section // 03_DISTRIBUTED MODEL RENDERING



The distributed model can find the more suitable porous landform through the stylistic deviation of different landforms. Structural voids can be used as storage places for ashes or souvenirs in new cemeteries.

prompt:grass ground, many structure, overgrow, taihu rock, honey weathering, smooth; There are many holes in the stone; architecture rendering, perspective view, sky background; steps: 30; sampler: dpmpp_2m; scheduler: karras; model: sd1.5\xsmerge_v31IN; cfg: 8.0; denoise: 1.0; 2000x2000

AI-Generated Architectural Prototype Section // 03_DISTRIBUTED MODEL RENDERING



This ComfyUI workflow leverages the combined power of IPAdapter and ControlNet to generate images that feature honeycomb weathering textures while preserving the spatial structure of an input scene. It begins by loading a Stable Diffusion base model along with an IPAdapter module, which extracts visual style features from a reference image showcasing natural rock formations. Simultaneously, a 3D-rendered scene is processed through Canny edge detection and a Zoe depth map to provide structural guidance via ControlNet. A positive text prompt describes the desired natural erosion patterns, while a negative prompt filters out common visual flaws. These multi-modal conditions—style, structure, and semantics—are integrated through the KSampler, resulting in a final image that harmonizes organic texture with controlled geometry. This workflow is ideal for architectural or urban design concepts that explore the intersection of natural forms and human-designed environments.



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Predict the future of the project through AI instructions. The original city was covered with plants and moss, and the city withered.

prompt:grass more detailed, honey weathering rocks, many holes and caves on it, Ant colony, grass on it, human activity, park background, road, architecture rendering, , 8k; steps: 25; sampler: dpmpp_2m; scheduler: karras; model: sd1.5\xsmerge_v31IN; cfg: 8.0; denoise: 1.0; 2000x2000

