Under the Sea: *Milestone 1*

Joanna Fisch, Nick Liu, Yuhan Liu

Recap: Project Pitch

Real-time, infinitely explorable ocean, generated by combining some of the latest publications in parallelizable graphics algorithms.

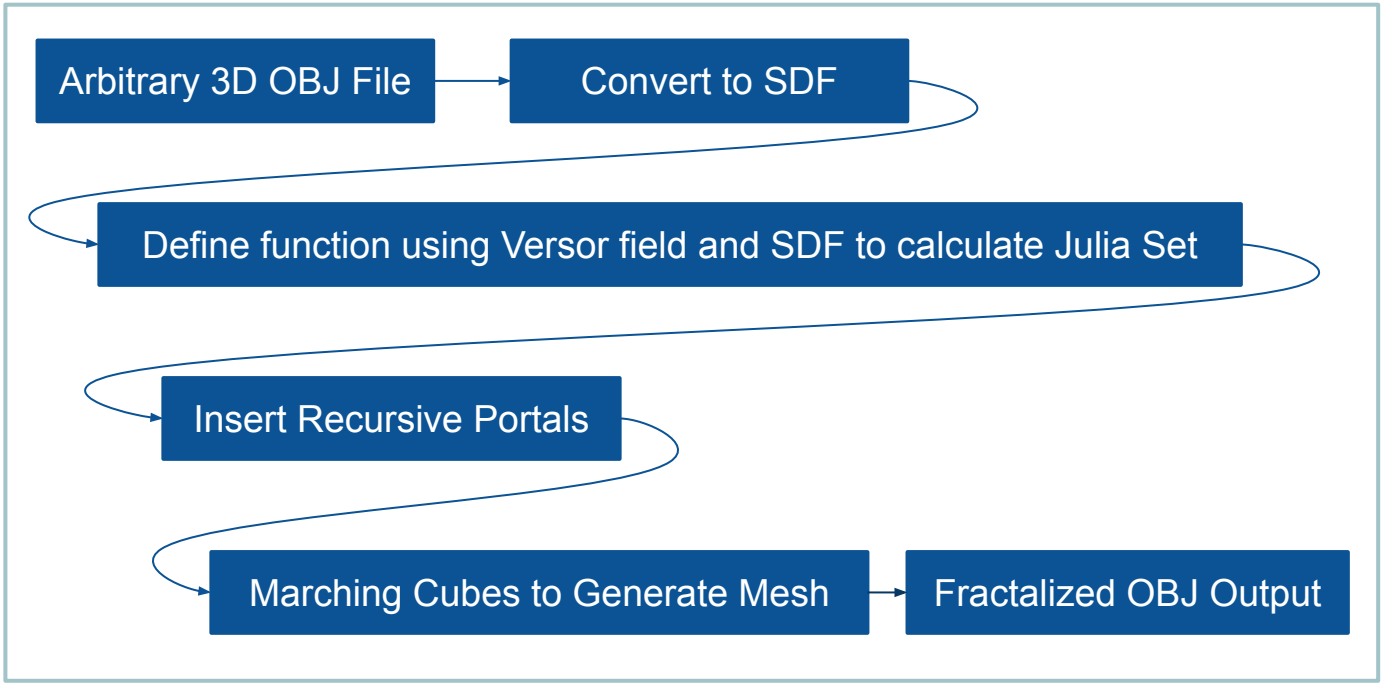
Implemented in **WebGPU**

Progress Update: Literature

Topic	Publication	Status	Next Steps
Fractal Coral Reefs	Into the Portal: Directable Fractal Self-Similarity (SIGGRAPH ‘24)	Paper read & implemented naive (CUDA)	Optimize algorithms (Marching cubes, Versor field)
Tile & Blend Ocean Surface	Fast orientable aperiodic ocean synthesis using tiling & blending (HPG ‘24)	Paper read, implementation in-progress (WebGPU)	Implement Fourier Transform for Mesh displacement
Real-Time Underwater Spectral Rendering	Real-Time Underwater Spectral Rendering (HPG ‘24)	Paper read, implementation in-progress (WebGPU)	Implement caustics & god rays

Milestone 1: Into the Portal: Directable Fractal Self-Similarity Implementation

Working implementation of SIGGRAPH 2024 Paper
for Procedural Asset Generation:



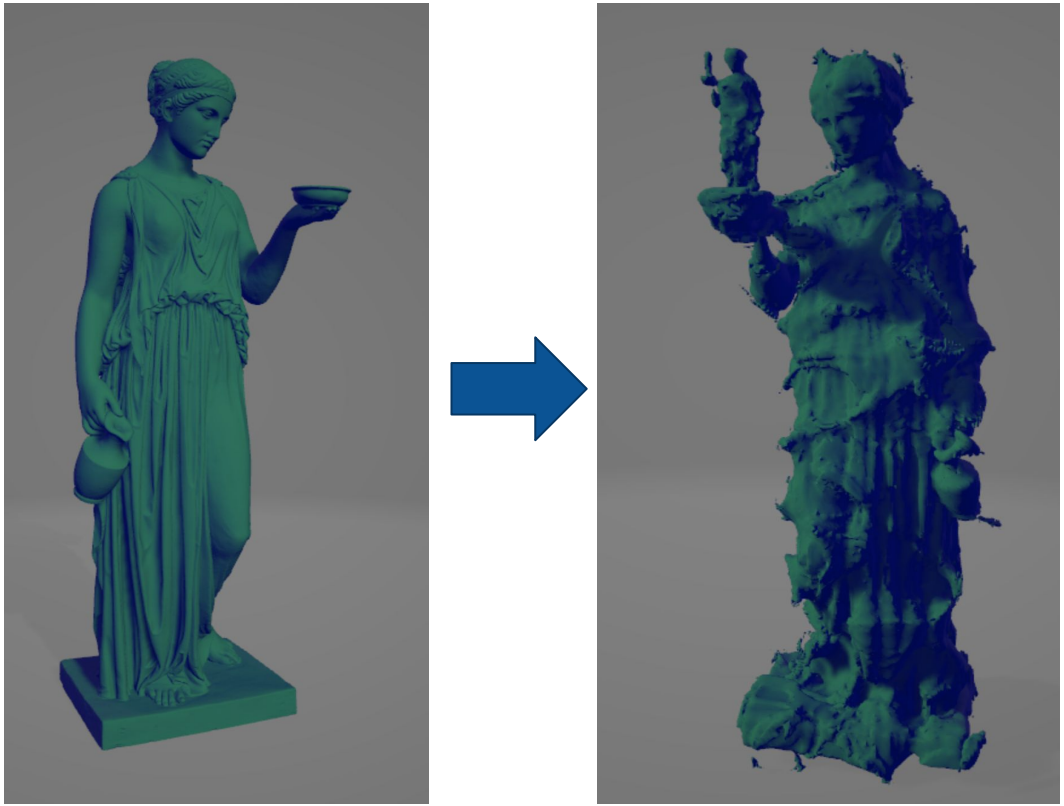
Milestone 1: Into the Portal: Directable Fractal Self-Similarity Implementation

Recursive Portals

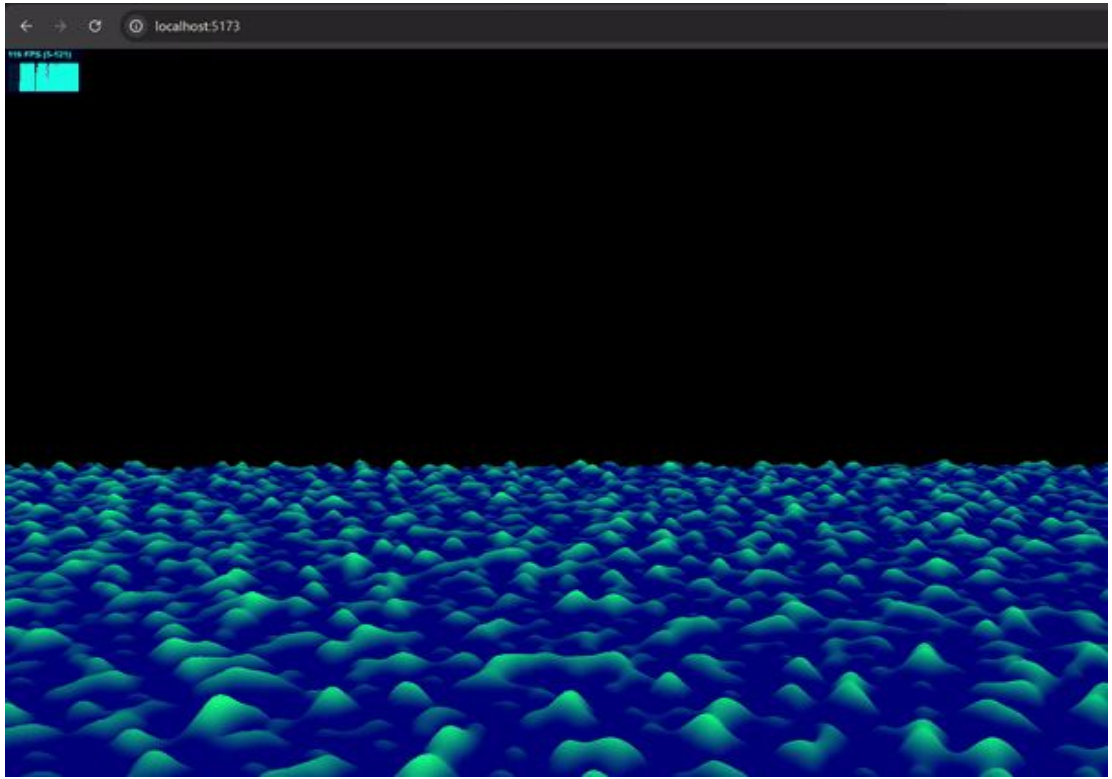
Uses Julia-set inspired dynamical system to generate specifiable self-similar regions with chaotic details.

All resulting mesh images are from our implementation.

Compute functions written by authors (we will update/improve upon them)



Looking Ahead: WebGPU Ocean Renderer



In-Progress

Optimize fractalized mesh generation, add to WebGPU

Ocean surface is currently infinitely-expanding Perlin noise, incorporate Fourier

Finish rendering & lighting, on top of spectral rendering

To Begin in Milestone 2

Sea creature NPCs

Content details (i.e. ocean floor)

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