

Amr Morsy

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SUMMARY

Graphics programmer with 1 year of experience specializing in developing game engines, simulations, and video games, utilizing low-level graphics APIs such as [OpenGL](#), [Vulkan](#), [Direct3D](#), and [Metal](#), with a strong focus on real-time performance and optimization.

EDUCATION

Concordia University | Montreal, Canada

Bachelor of Science in Computer Science | Jan 2019 - May 2024

University of Bergen | Bergen, Norway

Erasmus Exchange Program | Jan 2021 - Jan 2022

PROJECTS

Ocean Simulation | (C++, OpenGL) | [Project Website](#)

Real-time ocean simulation developed in [OpenGL](#), using Fast Fourier Transform (FFT) for wave simulation and [OpenCL](#) for optimization. Features Physically-Based Rendering (PBR), image-based lighting (IBL), and an HDR skybox. Inspired by Jerry Tessendorf's paper 'Simulating Ocean Water'.

Game Engine | (C++, Vulkan) | [Project Website](#)

Game engine developed in [Vulkan](#), featuring Physically-Based Rendering (PBR), Image-Based Lighting (IBL), HDR skybox, volumetric fog, shadow mapping, dynamic tessellation, and noise generation. Integrated collision detection, skeletal animation, rigid body physics, and compute shaders for performance.

Procedural Terrain Generation | (C++, OpenGL) | [Project Website](#)

Real-time procedural multifractal terrain generation, developed in [OpenGL](#), that generates infinite multifractal terrains using Fractal Brownian Motion (fBM) and Perlin Noise. Features Physically-Based Rendering (PBR), Image-Based Lighting (IBL), HDR skybox and Volumetric Fog Rendering.

Cloth Simulation | (C++, OpenGL) | [Project Website](#)

Real-time cloth simulation, developed in [OpenGL](#), that employs a Mass-Spring System, inspired by the paper "Fast Simulation of Mass-Spring Systems" by Liu et al. Parallelized using Compute Shaders and features Physically-Based Rendering (PBR), image-based lighting (IBL) and an HDR skybox.

Game Engine | (C++, OpenGL) | [Project Website](#)

Game engine developed in [OpenGL](#), featuring Physically-Based Rendering (PBR), Image-Based Lighting (IBL), HDR skybox, volumetric fog, shadow mapping, dynamic tessellation, and noise generation. Integrated collision detection, skeletal animation, rigid body physics, and compute shaders for performance.

EXPERIENCE

Freelance Graphics Programmer

Jan 2024 - Present

- Developed simulations and desktop applications for several clients using low-level graphics APIs such as OpenGL, Vulkan, Direct3D and Metal. Tutored several university students in different countries in computer graphics, helping them understand core concepts and complete assignments and projects. Authored several technical blogs explaining advanced computer graphics techniques ([Blog](#)).

Teaching Assistant | Computer Graphics

Concordia University | Montreal, Canada | Jan 2022 - Present

- Led weekly lab sessions, explaining complex computer graphics topics to a diverse student body, while offering individualized support to help students understand and apply concepts in their projects and assignments

SKILLS

C | C++ | OpenGL | Vulkan API | Direct3D | Metal API | OpenMP | OpenCL | CUDA | Blender | GLSL Shader Programming