Amr Morsy

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SUMMARY

C++ developer with over 5 years of experience, specialized in Computer Graphics, Animations, and Game Development. My expertise includes designing advanced game engines, developing graphics-intensive applications, and proficiency in parallel and multicore programming for optimizing large-scale projects.

EDUCATION

Concordia University | Montreal, Canada
Bachelor of Science in Computer Science | Jan 2022 - Dec 2023

University of Bergen | Bergen, Norway
Erasmus Exchange Program | Jan 2021 - Dec 2021

The American University in Cairo | Cairo, Egypt
Bachelor of Science in Computer Science | Sept 2018 - Dec 2020

PROJECTS

Cloth Simulation | (C++, OpenGL, OpenMP) | GitHub
- Developed a Cloth Simulation using C++ and OpenGL, incorporating Mass-Spring System for dynamic cloth physics, based on the paper "Fast Simulation of Mass-Spring Systems" by Liu et al.
- Enhanced the performance of the simulation by parallelizing it with OpenMP.
- Incorporated advanced rendering features including physically-based rendering (PBR), image-based lighting (IBL), shadow mapping, fog rendering and high dynamic range (HDR) skyboxes.
- Executed cloth physics simulation with customizable parameters (stiffness, damping, mass), enabling versatile cloth behaviour, and integrated realistic collision detection and response for accurate cloth-object interactions.

Ocean Simulation | (C++, OpenGL, OpenCL) | GitHub
- Developed an ocean simulation using C++ and OpenGL, incorporating Fast Fourier Transform (FFT), based on the paper "Simulating Ocean Water" by Jerry Tessendorf
- Enhanced the performance of the simulation by parallelizing it on the GPU with OpenCL
- Incorporated advanced rendering features including physically-based rendering (PBR), image-based lighting (IBL), shadow mapping, fog rendering and high dynamic range (HDR) skyboxes.
- Implemented the Phillips Spectrum for statistical modelling of wave energy distribution across different frequencies and incorporated wake effects to enhance the realism of the simulation.
- Added an an infinite ocean for an immersive experience, and optimized it by implementing frustum culling

Ray Tracer | (C++, OpenMP) | GitHub
- Developed an advanced RayTracer application using C++, capable of rendering photorealistic 3D images.
- Incorporated high-level graphics features including Motion Blur, Global Illumination, and Depth of Field, enabling the creation of lifelike visual outputs.
- Enhanced the application's performance by parallelizing tasks using OpenMP, significantly reducing processing times for complex renderings.

EXPERIENCE

Teaching Assistant | COMP 371 - Computer Graphics
Concordia University | Montreal, Canada | Jan 2023 - Present
- Led weekly lab sessions, emphasizing clarity in instructing complex computer graphics topics to a diverse student body
- Assisted students individually, facilitating comprehension and application of concepts in their projects and assignments
- Employed a deep understanding of computer graphics to enhance and support students' educational journeys

ACHIEVMENTS

Africa & Arab Collegiate Competitive Programming Championship | Cairo, Egypt | Team Rank 11 - 2020

SKILLS

C | C++ | OpenGL | OpenMP | OpenCL | GPU acceleration | GLSL Shader programming | Graphics debuggers