Abdulrahmen Almodaimegh

abdul.almod@gmail.com github.com/Abdul-Nosirrom

Education

Boston University **Sep. 2019 – May. 2023**

B.A In Physics — Minor In Computer Science GPA: 3.86 (Honors)

Experience

Boston University Larkin Lab [BioPhysics] **November 2021 – Present**

Research Assistant *Boston, USA*

- Research in the growth dynamics and morphology of biofilms
- Implemented volumetric rendering techniques for visualizing confocal microscope datasets
- Worked with OpenCVs CSRT Tracker implementation to create a tracker for thousands of flurosceant beads in microscope datasets
- Setup a system to create surface meshes based on confocal data-sets using point cloud triangulation for further geometric analysis
- Worked with various Scipy & OpenCV toolsets for image segmentation and analysis of microscope phase images

Publications

Growth Dynamics Of B. subtilis Biofilms examined through tracking of flurosceant beads

- In Progress

An Agent-Based Model of Metabolic Signaling Oscillations in B. subtilis Biofilms

- Under Review

Unreal Engine Rendering: Light Smuggler | *C++*, *HLSL* **October 2024**

- Modified Unreal Engines Forward Renderer Base-Pass to expose all lighting data to its Material Graph

Projects

DirectX11 Renderer | *C++*, *DirectX11*, *Win32*, *HLSL* **January 2024 - Ongoing**

- Implemented a render graph system
- Implemented basic resource and bindables pooling
- Worked on PBR rendering and post processing techniques

UE: HLSL Material Plugin | *C++*, *HLSL* **June 2024 - July 2024**

- Developed plugin allowing for writing Unreal Engine materials in pure HLSL using a custom syntax

UE: Procedural Cross-Section Mesh Tool | *C++* **June 2024 - July 2024**

- Mesh generator using various curves defining cross-section, depth over length, and height over length
- Support for multiple extrusion methods including straight extrusion, rotation extrusion, and spline extrusion

Analytic Eigensystems For Isotropic Distortion Eneriges Implementation | *C++* **December 2022**

- Implementation of 'Analytic Eigensystems For Isotropic Distortion Energies' T. Kim et al
- Uses LibGL and implements energy optimization techniques described in the paper

Gameboy Emulator | *C++*, *Assembly* **May 2022**

- Developing a gameboy emulator in a team of three students.
- Implemented basic emulation of Intel I8080 CPU.

Bownian Motion Simulation | *C++* **April 2021**

- Developed a Brownian motion simulation using OpenGL for a Computational Physics University course.
- Implemented basic sphere-sphere collision detection for simulating many-particle interactions.

Contributions

Hazelights Unreal Engine AngelScript Fork | *C++*

- PR528: Fix UPROPERTYs not being bound to script when bAllowImplicitPropertyAccessors = False
- PR536: Allow literal assets {Type} to have an underscore

Technical Skills

Languages: Python, Java, C, C#, C++, Fortan, Bash, x86 Assembly, GLSL, HLSL
Developer Tools: DirectX11, Win32, OpenGL, OpenCV, ImGui, Unity, Unreal Engine, Blender, Jupyter Notebook, Houdini
Technologies/Frameworks: Linux, Perforce, GitHub, CMake, Latex, Microsoft Excel, ImageJ