Aviral Goel

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EDUCATION

University of Southern California   Los Angeles, CA
Master's in Computer Science, Game Development   *Aug. 2022 – May 2024*

Birla Institute of Technology   Ranchi, India
Bachelor's of Engineering, Computer Science GPA: 3.68   *Aug. 2016 – May 2020*

TECHNICAL SKILLS

Languages: C++, C, C#, Python, Java, Solidity, JavaScript, Assembly Language
Developer Tools: Unity, Unreal, Maya, CLion, Perforce, Visual Studio, Ryder, Git
Libraries: SDL, OpenGL, GLFW, GLAD, ImGui, Mpi4py, Sockets, Photon Networking, upng

PROJECTS

Avi(ral's) Graphics Library | *C, Graphics Programming* | GitHub   Aug 2022 – Present
- Built a graphics library capable of loading and rendering 45K+ triangles at 60FPS using just C and SDL library.
- Accomplished linear transformation, backface culling, perspective projection, z-buffer algorithm, directional lighting, Barycentric coordinates for interpolation, flat shading, and Gouraud for rasterization of 3D models.
- Coded third-person camera and PNG texture mapping with perspective correctness for 45K+ triangle faces.
- Performed view frustum culling, loading multiple meshes per scene, and managed version control using git CLI.

Try Again, Team Game Project | *Unity, C#,* | Youtube   Aug 2022 – Present
- Extended Unity's tag system to support more than one tag, such as breakable, throw-able, pick-able, etc., for a single gameObject, allowing the player to interact with objects in multiple ways.
- Worked with Cinemachine to have third-person and side-view cameras switch back and forth based on map locations. Also, allowing the player to adjust camera orientation.
- Wrote a script for altering camera rotation, thereby overriding the restriction set by the Cinemachine Transposer.

OpenGL Batch Rendering | *C++, OpenGL, GLSL* | GitHub   Jul 2022 – Sep 2022
- Learnt the basics of OpenGL in C++, including vertex buffer, index buffer, vertex array objects, and textures.
- Implemented fragment and vertex shader with the ability to batch render quads having multiple textures or colors.
- Abstracted separate classes to maintain buffer layouts, vertex array objects, textures, and shaders.
- Familiarized with ImGui, STBI, GLAD, and GLFW helper libraries in sync with OpenGL to help render on screen

Client Server Rock Paper Scissor Game | *Python, Sockets* | GitHub   Jan 2022 – Feb 2022
- Implemented a system to allow players to act as game servers to host a game and earn rewards.
- Demonstrated the capability of sockets networking and incentivized volunteer computing in video games.
- Strengthened solution for games to solve the problem of old dead/inactive dedicated servers to play online.

EXPERIENCE

Lead Programming Instructor   Jan 2021 – Jan 2022
Oman Coding Academy   *Muscat, Oman*
- Spearheaded company's programming curriculum for 10 different tracks C++, Python (Data Analysis and Visualization), Web Development (HTML CSS, JS), Scratch, 3D Printing with TinkerCAD for kids (6-18 years).
- Created automation scripts in Google Suite and Zapier to streamline workflow thus saving 20+ hours of staff time.
- Acquired 200+ students to enroll in 3 months long courses fetching a revenue of 8000 USD.

Unity VR Engineering Intern   Jun 2019 – Dec 2019
Sar Centre for Virtual Reality   *Muscat, Oman*
- Developed a virtual reality training simulation to train heavy crane operators at shipping ports.
- Worked with Oculus SDK for Unity to build an application for Oculus Quest with six degrees of freedom.
- Engineered a virtual joystick to be grabbed and moved in the simulation just as a real joystick would.

LEADERSHIP & INVOLVEMENT

Contributor   Aug 2022 – Present
ScratchAPixel.com   *Los Angeles, CA*
- Contributed as an editor to the ScratchAPixel website for graphics programming with 120K visits per month.