Ray DongHo Kim

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SKILLS & INTERESTS

- **Languages:** Python, C++, C, C#, OpenGL, GLSL, JavaScript, TypeScript, Swift, Java, ThreeJS, NodeJS, ReactJS, MySQL
- **Software/Tools:** Unity, Unreal Engine, Maya, Houdini, ZBrush, QT, Adobe Photoshop, Adobe Illustrator

WORK EXPERIENCE

Amazon: ***Software Engineer*** ***Aug 2022 - Present***

- Optimized Customer Eligibility Check by implementing caching feature to reduce redundant API calls, **cutting unnecessary checks by 15%** and **saving $1.5K monthly**
- Engineered backend feature for internal Billing Ops application, enabling batch submission and processing of requests, **improving operational efficiency by 12%** and reducing workload for engineers
- Developed new features in Babelfish for Aurora PostgreSQL, **enhancing query translation coverage by 13%** based on client requirements

Apple: ***Software Engineer Intern*** ***May 2021 - Aug 2021***

- Prototyped **Voxel Painter app for Vision Pro**, focusing on efficient storing and rendering of 3D mesh data using RealityKit and MetalKit
- Optimized voxel mesh data using vertex shader culling, **increasing renderable voxel size by 27%** while eliminating lag and flickering
- Led design of **new UI/UX model of various tools** like Color Picker, collaborating closely with designers to refine and enhance core interaction models for **AR environment** through multiple iterations

University of Pennsylvania: ***Teaching Assistant: Interactive Computer Graphics*** ***Aug 2020 - May 2021***

- Instructed Computer Graphics topics to graduate and undergraduate students, such as rasterization, mesh data structures, ray tracing, and rendering pipeline, and mentored them in developing sandbox game using C++ and OpenGL

Seoul Robotics: ***Software Engineer Intern*** ***Jun 2020 – Aug 2020***

- Created **real-time interactive web visualizer** using WebGL to display point-cloud data with **over 1M points per tick** from lidar for clients' testing/demo tool
- Implemented backend utilizing Flask and ZeroMQ to receive point-cloud and bounding box data from 3D Perception Engine
- Built **Lidar Web-Simulator** that allows addition of lidars and objects, to **generate simulated point-cloud data** from 100+ lidars using ray-casting method

PROJECT

StellAR | *Unity, C#, Meta XR SDK*

- Built **AR app** promoting neck health and mental wellness by immersing users in star-filled sky, subtly guiding them to **improve neck posture** and enjoy **meditative experience**
- Integrated real star data with calibrated visuals and sounds, overcoming challenges in **gaze tracking** and star connections for smooth, wellness-focused interaction

Monte Carlo Path Tracer | *C++, OpenGL*

- Developed Path Tracer with Global Illumination effect using Monte Carlo estimation with Multiple Importance Sampling
- Engineered various surface materials, lights, path tracing methods, and **optimized render speed by 30%** using K-d tree

Mini-Minecraft | *C++, OpenGL*

- Created simple version of **sandbox game Minecraft**, responsible for efficient terrain rendering and chunking, which improved **rendering efficiency by 50%**
- Built **procedurally generated terrain** with varying biomes using **FBM/Perlin noise** functions and **L-System** as player roams environment

Various Shaders with OpenGL | *C++, OpenGL*

- Implemented range of **surface shaders**: Blinn-Phong, Matcap, Iridescent, etc. and **post-processing shaders**: Vignette, Gaussian Blur, Sobel filter, etc. using OpenGL for enhanced visual rendering and dynamic scene effects

Road Runner: Errand Service Application | *NodeJS, ReactJS, MySQL*

- **Led team of 5** to develop and launch **errand platform** for college students on iOS and Android, gaining **50+ active users**
- Implemented server and REST API for **user authentication** and **errand request management** using Node.js and MySQL

EDUCATION

University of Pennsylvania ***Philadelphia, PA***

M.S.E. in *Computer Graphics and Game Technology* *May. 2022*

B.S.E. in *Computer Science: Digital Media Design* *Dec. 2021*

- Courses: Scalable & Cloud Computing | Operating System Design | Computer Systems | Machine Perception | Interactive Computer Graphics | VR Game Design | Phys. Based Rendering | Procedural Graphics