CHRISTIAN ROBLES

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EDUCATION

Master of Computer Science, Multimedia & Creative Technologies — 2021 - 2023
University of Southern California, 3.73 GPA

Bachelor of Computer Science — 2013 - 2017
Arizona State University

WORK EXPERIENCE

Autodesk, Graphics Platform Team — Summer 2022
Software Engineer Intern — *Remote*

- Enhanced the MaterialX look development framework with export from Autodesk Standard Surface to glTF PBR.
- Developed a test pipeline to render translation stages on 350+ materials from the AMD GPU Open Material Set.
- Engaged open-source community to contribute translation node graph back to MaterialX. (Blog Post)

Microsoft, Commercial Software Engineering — 2017 – 2021
Software Engineer II — *Cambridge, MA*

- Led the design and implementation of data cleaning and featurization pipelines for clinical healthcare data.
- Extended critical infrastructure in energy & transportation with support for multiple cloud providers.
- Attended student hackathons on behalf of Microsoft to provide technical presentations and judging.
- Taught AP Computer Science in the 2020-2021 school year through the TEALS Program.

PROJECTS

Vulkan Graphics Engine. Developing a Vulkan graphics engine with SDL2 and ImGui. Engine renders textured glTF models with normal maps, shading, directional shadow maps and an interactive camera. Refactoring to a GPU-driven architecture to leverage indirect draws and compute shader vertex processing. Describing development process on my blog.

Grandma Green. Collaborated with artists, designers and developers to ship a virtual pet and farming simulation game in Unity with over 7,000 downloads on the App Store. Designed and implemented performant data structures and routines for genotype expression, garden serialization and daily task tracking. Worked with teammates to meet ship deadlines.

Directed Research: EARS. Developed a C++ forward path tracer demonstrating state-of-the-art techniques in Russian Roulette & Splitting. Implemented iterative optimization of threshold parameters with respect to estimator efficiency and ground-truth approximation as described in Rath et. al.'s "Efficiency-Aware Russian Roulette & Splitting (EARS)" (SIGGRAPH 2022). Shared a bi-weekly development series on my blog describing progress and results.

Signed Distance Fields. Led the design and development of a ray-marched SDF renderer demonstrating procedural clouds, displacement surfaces, constructive solid geometry, fractals, and GPU acceleration with CUDA. Presented results to peers as a final presentation and report. Project earned the highest grade in course with ranked project grading system.

SKILLS

Programming Languages
C++, Python, GLSL, C#, TypeScript, CMake

Software & APIs
Vulkan, RenderDoc, GLM, SDL2, ImGui, Unity, Godot

PERSONAL INTERESTS

Rock climbing, national parks, hiking, camping, coffee, video games.