

# CHRISTIAN ROBLES

mail@roblesch.page | [blog.roblesch.page](https://blog.roblesch.page) | Los Angeles, CA

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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

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## WORK EXPERIENCE

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

- Quickly ramped up to deliver C++, Python, and Node.JS code in large production and open-source repositories.
- Improved workflows for Autodesk customers with export from *Autodesk Standard Surface* to *glTF-PBR*.
- Developed an automated rendering pipeline to validate translations on 350+ *AMD GPU Open* materials.
- Engaged open-source community by contributing 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 healthcare data cleaning and featurization pipelines in Python and R.
- Extended critical Node.JS infrastructure in energy & transportation with support for multiple cloud providers.
- Taught AP Computer Science to Cambridge students in the 2020-2021 school year through the TEALS Program.

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## ACADEMIC PROJECTS

[NVIDIA Adaptive Shading](#). Integrated the NAS algorithm in an open-source game engine to reduce frame times by varying shading rate with respect to perceived error. Achieved reductions of up to 40% in regions with low perceptual complexity.

[Vulkan Graphics Engine](#). Developing a hobby game engine with Vulkan, SDL2 and ImGui. Engine loads and renders textured glTF models with hierarchical transforms, normal maps, shading, directional shadow maps and an interactive camera.

[Grandma Green](#). Collaborated with artists, designers and developers to ship a virtual pet and farming simulation game in Unity through the USC Advanced Game Projects program. Designed and implemented performant data structures and routines for genotype expression, garden serialization and daily task tracking. 8,000+ downloads on the App Store.

[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 a course with ranked project grading system.

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## TECHNICAL SKILLS

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

Software & APIs  
Vulkan, SDL2, RenderDoc, Unity, Godot, Docker

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## PERSONAL INTERESTS

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