

AUSTIN ENG

SOFTWARE & GRAPHICS ENGINEER

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EXPERIENCE

GOOGLE · MAY - AUGUST 2017 · SEPTEMBER 2018 - PRESENT

CHROME GPU SOFTWARE ENGINEER

- **Technical lead** for Dawn: Google's implementation of the WebGPU API. Dawn is a portable C++ library which maps efficiently onto native APIs D3D12, Metal, Vulkan, OpenGL, OpenGL ES, and D3D11.
- **Developed** significant portions of the implementation, and **guide contributions** from **15+ contributors** across multiple partner companies to ensure high code quality. Mentor multiple individuals on the project.
- **Architected and implemented** efficient integration into Chromium's multiprocess architecture to ensure low-overhead data transfer with cross-process GPU memory mapping.
- **Advocated** for and **partnered** with infrastructure teams to build more reliable, automated test infrastructure to improve developer productivity.
- Prototyped, designed, and launched **novel V8 to C++ bindings**, making JavaScript API calls for WebGL, WebGPU, and other Web APIs up to **300% faster**. Improvements yielded **12% CPU time reductions** in WebGL applications.
- Designed and implemented MultiDraw extensions in both Chrome and ANGLE to enable applications to more efficiently submit draw calls, **reducing CPU usage by 6x**.

ANALYTICAL GRAPHICS · JANUARY - MAY 2017

CESIUM 3D SOFTWARE DEVELOPMENT INTERN

- Contributed various features and optimizations to Cesium's rendering engine and 3D Tiles.
- Optimized **loading of heirarchical level of detail meshes** to **reduce data usage by 30-50%**.
- Developed and patented methods for **accurate and simulatenous rendering of heterogenous and multi-resolution meshes** without visual artifacts through the application of a **Bivariate Visibility Test**.
- Investigated tile **request scheduling with HTTP/2** to **reduce load times by 25%**.

DREAMWORKS ANIMATION · JUNE - AUGUST 2016

DEPARTMENT TECHNICAL DIRECTOR INTERN

- Developed **tools and plugins to improve workflow** for the lighting department with PyQt.
- **Optimized execution** of render submissions and **improved error reporting and logging** of jobs.
- Designed and built flexible tools for **comparing arbitrary project files with complex dependencies**.

WALT DISNEY ANIMATION STUDIOS · JUNE - AUGUST 2015

ART AND PRODUCTION INTERN

- Learned the entire animation pipeline through the **production of a short film**.
- Specialized in procedural modeling, effects, and technical animation in Houdini.
- Assisted in writing **scripts to solve pipeline problems** with animation and rig transfer.

ARTSICLE · JANUARY - MAY 2014

FULL STACK WEB DEVELOPER

- Developed **MVC architecture** for new features to assist artists in promoting their work.
- **Improved caching efficiency** with modifications to the Cashier gem.
- Rewrote portions of the test suite to **minimize external API calls for speed improvements** and protection of credentials.

ACHIEVEMENTS

PATENT · MAY 2017

SYSTEMS AND METHODS FOR 3D MODELING USING SKIPPING HEURISTICS AND FUSING

- Patent US9865085B1
- **Data-efficient loading and traversal of hierarchical level-of-detail trees** utilizing screen space error, to **skip levels-of-detail** without incurring visual artifacts.
- **Accurate rendering of overlapping heterogenous surfaces** through the application of a **Bivariate Visibility Test**.

EDUCATION

UNIVERSITY OF PENNSYLVANIA · AUGUST 2014 - MAY 2018

BACHELOR OF SCIENCE AND ENGINEERING · COMPUTER & INFORMATION SCIENCE

- GPA: 3.94

SKILLS

C++ · **D3D12/VULKAN/METAL** · **WEBGPU** · **OPENGL/WEBGL** · **JAVASCRIPT** · **HTML/CSS**
GLSL/HLSL · **CUDA** · **JAVA** · **PYTHON** · **HOUDINI** · **MAYA** · **RUBY**