Charles Giessen

cdgiessen@gmail.com
cdgiessen.github.io

- Education -

University Of Tulsa,
2015-2019
B.S. in Computer Science & Computer Simulation and Gaming
GPA: 3.79/4.0

- Skills -

Programming Languages: C++17, C, Java, C#, GLSL, Python

Technologies: Git, Bash, Eclipse, Visual Studio, OpenGL, Vulkan, WPF, MPI, OpenMP, OpenCL, Unity3D, Blender, Maya, GLM

- Activities -

- Student Volunteer at the SIGGRAPH 2018 Conference
- Volunteered to give an "Intro to Vulkan" talk at the 2018 Heartland Gaming Expo
- Volunteered at local elementary schools to teach programming, 2017
- Treasurer of a social video gaming club at the University of Tulsa, 2016-2019
- Technical Advisor for campus SIGGRAPH club, 2018-2019
- Participated in the University of Tulsa's 2015 Fall Hackathon, Team won 3rd

- Experience -

University Of Tulsa, Tulsa Undergraduate Research
- Summer 2014: Artificial Intelligence Research - Core computer science principles, theory, application, and intro to artificial intelligence research.
- Summer 2016: High Performance Computing and Attack Graph research - Worked on utility C string functions and parallel programming using MPI.

Tinker Air Force Base, 76th Software Maintenance Intern,
- Summer 2018: Designed a mission planner with WPF in C#, developed radar cross section solver in C++ with MPI, and explored socket based networking in C# and LabView.

- Projects -

Vulkan Rendering Engine, C++, Game engine designed around the Vulkan graphics API. Source
- **Terrain Renderer**, Heightmap based with automatic level of detail using a Quadtree and Memory pool for quick allocations.
- **Procedural Noise Texture Generator**, Users create 2D noise textures in a visual node graph editor with SIMD acceleration.
- **Cross platform - CMake** based**,** with Windows and Linux Support. Tested with gcc and msvc.

Pascal Compiler, C++, Project for the Compiler Construction course. Tokenizer & LL(1) grammar generator done, with the Parser, AST generation, and integration of the LLVM backend for code-gen in progress. Source

Orange Sherbert Game Engine, C++, OpenGL 4.0, Project for the Game Engine Design course. Source
- **Phong Shading**, diffuse & specular texture sampling.
- **Point, Direction, and Spot Lighting**, dynamic lighting
- **Custom Model Loading**, using Wavefront Obj's with optional normal recalculation
- **Transform Hierarchy**, dynamic position, rotation, and scaling supported

Project Luna, Unity3D/C#, RTS style game set on the moon with procedural levels and unit management.

Charles Math Library, C++, Graphics focused math library. Supports Vectors, Matrices, & quaternions, as well as common functions like perspective matrix calculation.