# Liam P Tyler

*Computer Scientist*

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## Education

2018–Present **Master's in Computer Science** *University of Minnesota*
Emphasis: Computer graphics

2014–2018 **B.S. in Computer Science, Math minor** *University of Minnesota*
Emphasis: Computer graphics GPA: 3.98/4.0

Relevant Coursework: Graphics 1, animation, rendering pipeline exploration (independent study), applied parallel programming, graphics and games, computer vision, data visualization directed research, advanced linear algebra, algorithms and data structures, operating systems 2, machine architecture, software engineering

## Work History

2015–Present **Teaching Assistant** *University of Minnesota*
I have lead recitations, labs, review and create course content, and guest lectured.
Classes Taught:
- CSCI 4041: Algorithms and Data Structures Semesters: 1
- CSCI 1113: Introduction to C++ Semesters: 6

Summer 2018 **Software Developer Intern** *Vital Images*
Improved a graphical tool for algorithm scientists to visualize the differences in 3D volumes, and helped design and implement a new regression testing framework

Summer 2017 **Research Assistant** *University of Minnesota*
Converted a new cancer cell migration simulator from Matlab to C++, and created some statistical tools to analyze the output and performance

Summer 2016 **Software Developer Intern** *Seagate*
Improved the functionality and layout of an intra company website, and created a new website for generating and managing documentation for a testing framework

## Skills

Languages: C++, C, Python, Cuda, Java, HTML, CSS, Javascript, SQL, PHP, x86 Assembly
Graphics: OpenGL, GLSL, Unity
Software: Visual Studio, Git, Microsoft Office Suite, Jenkins, Nginx, Apache
Systems: Linux (Ubuntu, Arch), Windows, and Mac

## Projects

Personal **Custom Game Engine (ongoing)** *Languages: C++, OpenGL, GLSL*
Currently am writing my own component based game engine in C++ and OpenGL. Currently features a tiled-deferred renderer, asset management, UI system, and scene loading

Graphics 1 **VR Real Time Ray Tracer** *Languages: C++, OpenGL, GLSL*
Implemented from scratch using OpenGL compute shaders and the MinVR framework. Worked for the HTC Vive, CAVE, and desktop

Computer Vision **3D Real Time Object Tracking** *Languages: C++, OpenGL, GLSL*
Used infrared cameras to recreate an object's position and rotation in real time, displayed using my game engine

Research **Cancer Cell Migration** *Languages: C++*
An interactive data visualization tool to help find and understand patterns in the output of the cancer cell migration simulator that I worked on in the summer of 2017

OS 2 **Implemented core components of an OS** *Languages: C*
Programmed an OS simulator how to schedule threads and processes, implemented many system calls such as fork(), write(), and execv(), and implemented a virtual memory system

Animation **Interactive Sound Propagation in Real Time** *Languages: C++, OpenGL, GLSL*
Used ray tracing and multithreaded SIMD fft convolution to simulate how the instruments should sounds for a listener in various environments in real time

## Extra Curricular Activities

- UMN Rock Climbing Team Officer *2016–2017*
  – Helped coach the UMN rock climbing team and managed the team email
- Volunteer at a parrot rescue shelter *Summer 2018 – Present*
- 2017 Minnehack participant, and 2015 ICPC regional competition participant
- Marathon runner and competitive rock climber