

# Max Slater

✉ mjslater@andrew.cmu.edu | 🏠 <https://thenumbat.github.io> | 🐦 TheNumbat | 🌐 TheNumbat

## Education

### Carnegie Mellon University

Pittsburgh, PA

B.S. IN COMPUTER SCIENCE, CONCENTRATION IN COMPUTER GRAPHICS, CONCENTRATION IN COMPUTER SYSTEMS, 3.96/4.0

Aug. 2018 - Dec. 2021

- Computer Graphics (TA), Discrete Differential Geometry, Technical Animation, Physics-Based Rendering, Intro to 3D Animation
- OS Design & Implementation, Compiler Design, Parallel Computer Architecture & Programming

### University of Nevada, Reno

Reno, NV

DUAL ENROLLMENT, 4.0/4.0

Jun. 2015 - May 2018

### Davidson Academy

Reno, NV

HIGH SCHOOL DIPLOMA, EMPHASIS IN COMPUTER SCIENCE AND MATHEMATICS, 4.0/4.0

Aug. 2013 - May 2018

## Experience

### Jane Street

New York City, NY

SWE INTERN

May 2021 - Aug. 2021

- Incoming SWE intern for summer 2021.

### Carnegie Mellon University

Pittsburgh, PA

UNDERGRADUATE RESEARCHER

Jan. 2021 - PRESENT

- Investigating high performance closest point query algorithms on modern GPU hardware in the context of Monte Carlo geometry processing.
- Working with Rohan Sawhney and Keenan Crane of the [Geometry Collective](#). Publishing project updates [here](#).

### Apple

Reno, NV

GPU SOFTWARE INTERN

May 2020 - Aug. 2020

- Developed a novel automated tool for comparing frame traces across platforms, increasing velocity of competitive performance analysis work.
- Selected to present project to SVP of software Craig Federighi and his team.

### NVIDIA

Santa Clara, CA

3D GRAPHICS SOFTWARE INTERN

May 2019 - Aug. 2019

- Constructed automated regression testing service measuring OpenGL/Vulkan graphics performance on embedded Linux devices.
- Profiled and diagnosed OpenGL benchmark performance bugs.

### University of Nevada, Reno

Reno, NV

HIGH SCHOOL RESEARCHER

May 2015 - May 2016

- Assisted in wireless networking research under Shamik Sengupta supported by NSF Grant #IIA-1301726.
- Authored and published a white paper on the subject.

## Teaching

### Carnegie Mellon University

Pittsburgh, PA

COMPUTER GRAPHICS TEACHING ASSISTANT (S20,F20,S21)

Jan. 2020 - PRESENT

- Re-wrote the course codebase, improving structure, performance, interface, and student directions/documentation (See software: Scotty3D).
- Held solo office hours, answered online questions, and assisted with project/exam grading. Designed short assignments and notes.

### Davidson Academy

Reno, NV

INSTRUCTOR

Aug. 2015 - May 2017

- Taught 3 years of high school computer science electives.
- Created curriculum on C++, data structures, and 2D graphics/games. Published [website](#) that maintains ~1.5k monthly views.

## Skills

**Programming** C++20, C, Rust, OCaml, SML, Python, x86

**Tools** OpenGL, Metal, Vulkan, Win32, Linux, Git

## Software

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### Scotty3D

[GitHub](#)

PRIMARY AUTHOR AND MAINTAINER

Jan. 2020 - PRESENT

- Educational software package implementing interactive 3D mesh editing, realistic path tracing, and dynamic animation. Includes code structure & guidelines for student projects in each respective area.
- Used in CMU 15-462/662 and Stanford CS248 (Cardinal3D) as a project framework.
- Implemented all systems, a modern OpenGL renderer, user interface, C++17 features, and many fixes/optimizations. Designed new student tasks and improved directions/resources.

### Exile Game Engine

[GitHub](#)

AUTHOR

Jul. 2017 - PRESENT

- *Handmade* from-scratch voxel game engine including a modern OpenGL deferred renderer, parallel voxel world generation, multiple OS layers, a custom C++ standard library with automatic type introspection, debugging/profiling features, and more.
- Currently working on a re-write, coming soon!

### Pebbles Kernel

CO-AUTHOR

Mar. 2020 - May 2020

- x86 Kernel supporting device drivers, preemptive multitasking, virtual memory protection, threading, and virtual consoles.
- Worked with partner to design & implement all features from scratch in C and x86 assembly.

### Navi Compiler

CO-AUTHOR

Aug. 2020 - Dec. 2020

- Compiler for a safe variant of C targeting x86 assembly and supporting SSA conversion with SCCP, graph coloring register allocation, various assembly optimizations, and a language-level threading library.
- Worked with partner to design & implement all features from scratch in Rust.

## Writing

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### Blog

<https://thenumbat.github.io/>

AUTHOR

Jul. 2018 - PRESENT

- Various technical write-ups and thoughts on education.

### Lists

[GitHub](#)

AUTHOR

Aug. 2017 - PRESENT

- Curated list of articles focusing on many areas of computer science and technology.

## Activities

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### CMU Esports

Pittsburgh, PA

OVERWATCH MANAGER AND PLAYER

2018 - 2020

- Managed and competed with the CMU Overwatch team in the Tespa collegiate league.

## Honors & Awards

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2018-2021 **Dean's List, High Honors**, Carnegie Mellon University

Pittsburgh, PA

2018 **National Merit Scholarship**, NMSC

Reno, NV