






# Cade Brown

Software Developer • Mathematician • Digital Artist

 [cade.site/about](http://cade.site/about)  [cadebrown](https://github.com/cadebrown)  [cade-brown](https://www.linkedin.com/in/cade-brown)  [me@cade.site](mailto:me@cade.site)  +1 865-368-8485

## EXPERIENCE

### Innovative Computing Laboratory | RESEARCH ASSISTANT (HPC)

2019 – Present | Knoxville, TN, US

- **Ported and performance-tuned** the MAGMA linear algebra library for new AMD GPU hardware
- **Improved performance** 60x faster for certain BLAS, 73% faster for Eigenvalue problems
- **Wrote and published a paper** analyzing the performance of MAGMA vs vendor implementations, published in IEEE HPEC: [bit.ly/3rGT8uj](https://bit.ly/3rGT8uj)

### PAIRS @ UTK | RESEARCH ASSISTANT (HCI)

2021 – 2022 | Knoxville, TN, US

- **Implemented a research prototype** of Avocat, an automated error solver for the terminal
- **Evaluated and improved** performance of database queries for WorldSyntaxTree, a terabyte-scale graph database of source code

### Leadership Computing Facility @ ORNL | RESEARCH INTERN

2016 – 2017 | Knoxville, TN, US

- **Used CUDA, MPI, and SDL** to build a realtime distributed fractal rendering application/simulation
- **Programmed the NVIDIA Jetson platform** to divide and distribute the workload between 8 nodes (CPU & GPU) over a local network
- **Coordinated with ORNL's MDF** for physical fabrication of the cluster computer's case
- **Used Jekyll, HTML, and GitHub** to build a public website: [simplesummit.github.io](https://simplesummit.github.io)

## PROJECTS

- **kscript, a dynamic programming language** that I wrote from scratch, check it out: [term.kscript.org](https://term.kscript.org) (online REPL)
- **Blok, a minecraft clone** built in C/C++, uses custom voxel and rendering engines: [github.com/cadebrown/Blok](https://github.com/cadebrown/Blok)
- **FRC#3966 robotics**, in which I was the programming team lead. Check out a robot I helped make: [bit.ly/3tQPXDc](https://bit.ly/3tQPXDc)
- **CARVE, an online RISC-V IDE** with an editor, debugger, and memory explorer: [carve.chemicaldevelopment.us](https://carve.chemicaldevelopment.us)
- **My digital art** which is often ML/AI-generated: [cade.site/art](https://cade.site/art)

## MY CODE

- [cade.site/timeline](https://cade.site/timeline)
- [github.com/cadebrown](https://github.com/cadebrown)
- [kscript.org](https://kscript.org)

## SKILLS

### Software

#### Languages

C/C++ • C# (Mono) • Python  
JavaScript • WebAssembly

#### Frameworks

CUDA • HIP/ROCm • OpenCL  
OpenMP • MPI • pthreads  
LLVM • Emscripten • ReactJS

#### Machine Learning

Tensorflow • PyTorch • TinyML

#### Graphics

OpenGL • WebGL • WebGPU  
Matplotlib • QT+PyQT • Unity3D

#### Misc

L<sup>A</sup>T<sub>E</sub>X • Blender3D • Jekyll

## EDUCATION

### University of Tennessee

B.S. COMPUTER SCIENCE

2019 – 2023\* | Knoxville, TN, US

GPA\*: 3.65 / 4.0