# **Cade** Brown

Software Developer • Mathematician • Digital Artist

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## Experience

### Innovative Computing Laboratory | Research Assistant (HPC, ML)

**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
- **Authored a paper (with Turing Award winner Jack Dongarra)** presenting the above findings at IEEE's HPEC: **cade.site/paper0**
- **Implemented GPU compute kernels** for the SLATE project: **cade.site/slate**

### 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

**2017 – 2018 | Oak Ridge, 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
- **Used Jekyll, HTML, and GitHub** to build a public website: **simplesummit.github.io**

## Projects

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

## My Content

- ➔ **lwn.net/Articles/833624**
- ➔ **cade.site/archive**
- ➔ **docs.kscript.org**

## My Code

- ➔ **cade.site/timeline**
- ➔ **github.com/cadebrown**
- ➔ **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**
LaTeX • Blender3D • Jekyll

## Education

### University of Tennessee

B.S. Computer Science
**2019 - 2023* | Knoxville, TN, US**
**GPA*: 3.65 / 4.0**