






Cade Brown

Software Developer • Mathematician • Digital Artist

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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:
cade.site/paper0

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

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 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

L^AT_EX • Blender3D • Jekyll

EDUCATION

University of Tennessee

B.S. COMPUTER SCIENCE

2019 - 2023* | Knoxville, TN, US

GPA*: 3.65 / 4.0