Cade Brown

brown.cade@gmail.com

(865) 368-8485

EDUCATION

Currently attending UTK (University of Tennessee Knoxville), studying Computer Science, with expected graduation in 2023.

TECHNOLOGY SKILLS

I have written programs in many programming languages, including C, Python, Java, and JavaScript. I can adapt to a large range of systems, including embedded, high performance, and restricted environments. Additionally, for my personal computing, Linux is my operating system of choice, and I use mostly FOSS programs.

I run a few websites (`http://programming.lnstempunks.org`, `http://chemicaldevelopment.us`), and these mostly use GitHub pages with Jekyll, a static site generator with Liquid support.

Most of my documents are written in LaTeX, including this resume. I also am familiar with other presentation & document software, but prefer LaTeXfor most needs.

EXPERIENCE

ICL : MAGMA

Summer 2019 - Current

Since Summer of 2019, I have worked at ICL (Innovative Computing Laboratory) in the Linear Algebra department as a research assistant to Dr. Stan Tomov.

This project has given me a lot of experience in working in a professional research environment, meeting deadlines, and implementing HPC (High Performance Computing) algorithms on GPU hardware. I specifically focused on hipMAGMA, an effort which aims to add support for running MAGMA on AMD's new GPU hardware, which is programmed using the new HIP ROCm platform.

MAGMA is included in xSDK, and in many supercomputers around the world (ORNL's Titan, Summit, etc), and my efforts at ICL will make it available on ORNL's upcoming supercomputer, Frontier.

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https://icl.cs.utk.edu/magma/
https://developer.nvidia.com/magma
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ORNL Internship

Summer 2017 & Summer 2018

I interviewed and was accepted for internships at Oak Ridge National Laboratory (ORNL) in the Oak Ridge Leadership Computing Facilities (OLCF) department. There, I studied and implemented a distributed algorithm for computing fractals to demonstrate the power of supercomputers, specifically the OLCF's Summit supercomputer, currently the fastest supercomputer in the world. As part of this, I had the opportunity to benchmark my program on the Summit supercomputer.

I learned about the technical side of HPC (High Performance Computing), and how to solve a problem from start to finish using distributed techniques, including message passing (with MPI), communication over a network, taking in user input, and displaying the result in real time. I was the main system manager for a mini-cluster computer of 8 nodes, which included me updating software, setting up the local network connections, and other tasks to keep them running.

https://www.ornl.gov/ & https://simplesummit.github.io/ A video of what we've done: https://www.youtube.com/watch?v=fIOulrWkljo

L&N STEMpunks

Lead Programmer (2016-2018)
Programmer (2015-2016)

The L&N STEMpunks, which is FRC (FIRST Robotics Competition) #3966, focuses on robotics and community outreach. I was the software architect of the team, the mentor for young students, and the primary software developer. Our robots use NI Linux on an embedded (arm7) system. We typically use Java WPILIB for competition bots, but programming robots requires much more than just writing code. We also manage networks, connections, use versioning software, manage and update hardware and firmware, and more.

Students who join the programming team are taught the basics of team driven software development, including versioning software, software paradigms, and general team management software. Our team incorporates Git and GitHub, Java, Python, and Trello into our stack.

This project has been by far my best source of experience for working in a team as a leader. I have learned how to organize people into smaller groups and separate large tasks in order to achieve a goal.

http://lnstempunks.org

MPFR

Contributor

MPFR is a multiprecision C math library. It is geared towards research mathematicians and computer scientists. MPFR is also a requirement for the GNU Compiler Collection (GCC), which is included in virtually all Linux distributions.

I helped implement and test the beta (β) function, and offer assistance to users on the mailing list. This project has taught me how to write C89/ANSI/GNU specification C code which is used in research, commercial, and for hobbyist projects. Also, it has taught me to converse and write code with researchers across the world (mainly in France and Massachusetts) in a collaborative effort using Free and Open Source Software (FOSS) techniques.

http://mpfr.org