GRIFFIN DUBE

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Chicago, Illinois, USA

EDUCATION

Northwestern University - *Evanston, Illinois* GPA: 4.00 September 2021 - Present
– PhD Student in Computer Science

Clemson University - *Clemson, South Carolina* GPA: 3.79 August 2016 - May 2021
– Bachelor of Science in Computer Engineering
– Minor in Spanish Language

RESEARCH EXPERIENCE

Northwestern University - *Evanston, Illinois*
Research Assistant, Systems (Prescience Lab) September 2021 - Present

– Study and modify the front-end of a production compiler (Clang/LLVM) to investigate lowering of abstractions such as memory layout for unmanaged languages and their effect on performance.
– Measure performance impact of research on OpenMP and Pthreads based applications from the Mantevo suite as well as PARSEC, SPEC2017 and other benchmark suites.
– Gain understanding of code analysis and transformations impact on modern compiler pipelines.

Clemson University - *Clemson, South Carolina*
Research Assistant, Lossy Compression for Scientific Computing May 2020 - October 2021
– Researched the benefit of SIMD parallelism on lossy compression for CPU architectures using leading lossy compressor for scientific data, SZ.
– Investigated performance impact of alternative block padding methods on compression ratio and data quality of scientific data.
– Contributed to larger collaborative projects involving groups from Clemson University, Washington State University and Argonne National Laboratory.
– Studied a suite of common HPC workloads under a variety of domains (HACC, CESM, QMCPack, etc) to use in testing compression performance.

Creative Inquiry January 2019 - May 2021
– Designed, built and configured an HPC cluster to compete in the Supercomputing ‘20 Student Cluster Competition.
– Investigated structure and performance characteristics of extreme scale systems by designing a system modeled after a Top500 supercomputing cluster.
– Studied performance modeling of large scale systems using MPI, OpenMP and common HPC benchmarks like HPL and HPCG.

Oak Ridge National Laboratory - *Oak Ridge, Tennessee* June 2020 - August 2020
Science Undergraduate Laboratory Internship (SULI) Intern
– Researched optimization of lattice Boltzmann computational fluid dynamics proxy applications for the Summit supercomputer using CUDA C++ (improving time to solution by 49x).
– Reduced unnecessary data transfers and the amount of runtime spent performing communication by 90
– Communicated with other groups at ORNL to apply similar optimizations into their own application in different domain (Computational Biology, Nuclear Reactor Simulations)

WORK EXPERIENCE

Delta Air Lines - *Atlanta, Georgia* August 2018 - May 2020
Simulator Engineer Co-op

– Performed in depth research and modification of simulated aircraft systems and aerodynamics flight models in both Linux and Windows environments.
– Investigated and debugged complex hardware and software issues in simulator systems and aerodynamics simulation software (written in C and FORTRAN) in order to correct discrepancies.
– Worked according to FAA National Simulator Program regulations and requirements regarding regulations and procedures for documenting software issues.

PUBLICATIONS

1. **Griffin Dube**, Jiannan Tian, Sheng Di, Dingwen Tao, Jon C. Calhoun, and Franck Cappello. "Efficient Error-Bounded Lossy Compression on CPU Architectures," In Preparation.

2. **Griffin Dube**, Cavender Holt, John Hollowell, Sarah Placke, Sansriti Ranjan, Nikolas Heitzig, and Jon Calhoun, "Critique of "MemXCT: Memory-Centric X-Ray CT Reconstruction With Massive Parallelization" by SCC Team From Clemson University," in IEEE Transactions on Parallel and Distributed Systems, vol. 33, no. 9, pp. 2054-2057, 1 Sept. 2022, doi: 10.1109/TPDS.2021.3108961.

PRESENTATIONS/POSTERS

SC '20: ACM Student Research Competition — Virtual/Online
Reducing Data Motion of Lattice Boltzmann Simulations through Application of Boundary Conditions on GPUs — *November 17, 2020*

Summer Undergraduate Laboratory Internship — Oak Ridge, Tennessee
Reducing Data Motion of Lattice Boltzmann Simulations through Application of Boundary Conditions on GPUs — *August 5, 2020*

Ignite-Off 2020 — Oak Ridge, Tennessee
Optimizing Computational Fluid Dynamics Simulations — *July 28, 2020*

Focus on Creative Inquiry Forum — Clemson, South Carolina
High-Performance Cluster Computing: Engaging Young Scientists and Engineering in the 21st Century Laboratory — *April 2019*

AWARDS

Northwestern University Walter P. Murphy and Royal E. Cabell Fellowship — 2021-2022
1-year tuition and stipend offered to first-year PhD students

R&D 100 Award — Developer — 2021
SZ: A Lossy Compression Framework For Scientific Data
Project url: https://szcompressor.org

SKILLS

Programming
C/C++, CUDA, FORTRAN, MPI, VHDL, LLVM, Clang, Matlab, Python, Bash

Languages
English, Spanish, Portuguese