

Thomas Randall

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PhD Candidate, Clemson University | Advised by Dr. Rong Ge (rge@clemson.edu)

ABOUT ME:

I am a Graduate Research Assistant and PhD Candidate at Clemson University in the School of Computing (Go Tigers!). My research focuses on performance optimization and autotuning for High Performance Computing (HPC) workloads and applications, especially with GPUs. I am working towards my PhD dissertation at Clemson and have published research with scientists at Argonne and Oak Ridge National Laboratories. You can also regularly meet me in person at the SuperComputing conference -- for 2024 we will be in Atlanta, GA! My long-term career aspirations are to work as a Computer Scientist in the DoE National Labs and to continue serving the community at SuperComputing and other prestigious conferences in the field.

DISSERTATION SUBJECT: Transferable Performance Optimization for HPC

Everyone knows that software performance matters, but at large scales and when utilizing novel hardware, optimizing performance can prove to be both difficult and costly. My research broadly focuses on maximizing performance of leadership HPC systems with common accelerator hardware. These efforts include application-specific tuning to best utilize available hardware and transferable black-box performance tuning that permits efficient reuse of information.

TOP RESEARCH INTERESTS:

1. High Performance Computing / Heterogeneous Computing
2. Performance Autotuning AKA Parameter Search
3. Computer and System Architecture
4. Machine Learning Applications: Natural Language Processing, Large Language Models, and Graph Neural Networks

RESEARCH PUBLICATIONS:

[ICS'23] Thomas Randall, Jaehoon Koo, Brice Videau, Michael Kruse, Xingfu Wu, Paul Hovland, Mary Hall, Rong Ge and Prasanna Balaprakash, "[Transfer-Learning-Based Autotuning Using Gaussian Copula](#)", In Proceedings of the 2023 International Conference on Supercomputing (ICS '23)

[Best Paper ICS'21] Thomas Randall, Tyler Allen, and Rong Ge, "[FULL-W2V: Fully Exploiting Data Reuse for W2V on GPU-Accelerated Systems](#)", In Proceedings of the 2021 International Conference on Supercomputing (ICS '21)

INVITED TALKS AND FEATURED COVERAGE:

Oak Ridge National Lab Artificial Intelligence Seminar Series
Invited Presenter Spring 2024
Oak Ridge, TN

Argonne National Lab CS Seminar Series
Invited Presenter Summer 2023
Lemont, IL

I Am HPC
<https://sc23.supercomputing.org/2023/05/hpc-on-the-rise-thomas-randall/> Spring 2023
Online

Ask A Grad
SoC-GSA & UPE Fall 2022
Clemson, SC

- Invited to discuss undergraduates' interests in pursuing Graduate studies

EDUCATION AND AWARDS:

Entered PhD Program at Clemson University August 2019

Bachelor of Science in Computer Science
Minor in Business Administration
Clemson University May 2019
Major GPA: 3.93/4.00
Clemson, SC

ICS'21 Best Paper Summer 2021
ANL GIVENS Scholar Summer 2020, 2022
R.C. Edwards Graduate Fellow Fall 2019 -- Spring 2022
Clemson School of Computing Outstanding Undergraduate Researcher Spring 2019
Dupont Best Undergraduate Project Spring 2019

LEADERSHIP AND TEACHING EXPERIENCE:

Lead Student Volunteer, Guided Interest Group Leader, HPC Immersion Mentor Fall 2023
SuperComputing'23 Denver, CO

- Jointly organized conference Panels and Birds of a Feather with conference committee members
- Oversaw 100+ volunteers facilitating conference events
- Organized and engaged new students at SuperComputing through cohort events and discussions

Student Volunteer, Virtual Student Volunteer Fall 2020 (Virtual), Fall 2021, Fall 2022
SuperComputing'20, SuperComputing'21, SuperComputing'22 Online; St. Louis, MO; Dallas, TX

- Moderate online discussions and forward questions to presenters
- Enable communications between conference organizers and presenters

Graduate Teaching Assistant Fall 2019 — Spring 2023
Clemson University, School of Computing Clemson, SC

- Graded 30-100+ students each semester
- Prepared assignments, projects and homework for classes
- Aided students in office hours with questions about course materials and assignments
- Spring 2023: Developed new course for Clemson University with Assistant Professor Dr. Mert Pesé

Laboratory Teaching Assistant Spring 2017 — Spring 2019
Clemson University, School of Computing Clemson, SC

- Prepared and introduced labs and projects for students
- Aided students with questions and problems during lab time and office hours
- Graded laboratory assignments for up to 30 students

Summer Staff Coordinator Summer 2017
Isaiah 55 Deaf Ministries La Feria, TX

- Coordinated volunteer team responsibilities
- Oversaw and participated in construction projects, craft projects, and recreational projects
- Maintained and safeguarded facilities and volunteers