

TYLER ALLEN
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RESEARCH INTERESTS

- High-performance memory systems for large scale heterogeneous systems.
- Applying accelerated computing to non-traditional and underperforming problems.
- Machine Learning for systems-oriented applications.

ACADEMIC APPOINTMENTS

University of North Carolina at Charlotte
Assistant Professor, Department of Computer Science
Charlotte, NC
Fall 2022-Present

EDUCATION

Clemson University
Ph.D. Computer Science
Clemson, SC
Aug. 2022

- Thesis: Holistic Performance Analysis and Optimization of Unified Virtual Memory
- Advisor: Dr. Rong Ge

M.S. Computer Science
Dec. 2018

Western Carolina University
Cullowhee, NC

B.S. in Computer Science
May 2015

B.S. in Applied Mathematics
May 2015

- Honors College at Western Carolina University

EXTERNAL RESEARCH

Oak Ridge National Laboratory
Short-term Research Appointee, Future Technology Group
Oak Ridge, TN
Summer 2019

- Studied performance and use-cases for Intel Apache Pass NVDIMM hardware.

Lawrence Berkeley National Lab
NERSC Advanced Technology Group Research Intern
Berkeley, CA
Summer 2017, 2018

- Studied performance and energy usage of DoE HPC applications on Intel Knight's Landing Manycore CPUs used in Cori Supercomputer. Added energy monitoring for Cray systems to IPM open-source utility.

- Modeling of unified memory performance for NVIDIA GPUs and underlying hardware impacts.

TEACHING EXPERIENCE

University of North Carolina at Charlotte
Graduate Parallel Programming
Charlotte, NC
Fall 2022

Clemson University
Instructor of Record - Computer Organization and Design
Graduate Teaching Assistant - Operating Systems
Clemson, SC
Fall 2019
Spring 2018, 2019, 2020

Western Carolina University
Computer Science Lab Assistant/Tutor
Cullowhee, NC
Fall 2012-Spring 2015

MENTORING EXPERIENCE

Mentor for Nathan Jones - Undergraduate Student <i>Current Status: Undergraduate Student at Clemson University</i>	2022-Present
Mentor for Thomas Randall - Undergraduate and Graduate Student <i>Current Status: Graduate Student at Clemson University</i>	2018-Present
Mentor for Bennet Cooper - Undergraduate and Graduate Student <i>Current Status: Graduate Student at Clemson University</i>	2019-Present
Mentor for Derek Rodriguez - Undergraduate <i>Current Status: Graduate Student at Northeastern University</i>	2018-2019

WORK EXPERIENCE

IT Services, Harris Regional Hospital <i>IT Associate</i>	Sylva, NC Summer 2010-Fall 2011
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AWARDS AND SCHOLARSHIPS

- *Best Paper Award, International Conference on Supercomputing (ICS), 2021*
- *Special Recognition for Research Achievements and Service, School of Computing, Clemson University*
- *Outstanding Graduate Teaching Assistant, School of Computing, Clemson University, 2019-2020*
- *Student Volunteer Travel Grant, Supercomputing, 2017-2021*
- *Student Author Travel Grant, International Parallel & Distributed Processing Symposium (IPDPS), 2019*
- *Graduate Travel Grant, Clemson University, Summer 2019*
- *Upsilon Pi Epsilon Member, 2016-Present*
- *Upsilon Pi Epsilon ACM Student Chapter Scholarship Award (Merit Based Scholarship), 2013-2014*
- *Dean's Outstanding Scholar Award (College of Arts and Sciences), Western Carolina University, 2013-2014*
- *Proffitt's Pecuniary Propitiousness Protocol (Computer Science Academic Scholarship), 2013-2014*
- *Senior Computer Science Award, Western Carolina University, 2013-2014*
- *Sophomore Computer Science Award, Western Carolina University, 2012-2013*
- *Dean's List of Distinguished Students, Western Carolina University, Fall 2011-Spring 2015*

LEADERSHIP & SERVICE TO THE COMMUNITY

- *Students@SC Lead Student Volunteer Program Co-Chair, Supercomputing Conference, 2022*
- *AD/AE Appendixes Committee, Supercomputing Conference, 2022*
- *Technical Paper Session Chair, Supercomputing Conference, 2021*
- *Students@SC Guided Interest Group Coordinator, Supercomputing Conference Planning Committee, 2021*
- *Students@SC Student Representative, Supercomputing Conference Planning Committee, 2021*
- *Student Volunteer Application Reviewer, Supercomputing Conference Planning Committee, 2019-2021*
- *Lead Student Volunteer, Supercomputing 2019, 2020, 2021*
- *Student Volunteer, Supercomputing 2017, 2018*
- *Computer Science Representative, Clemson College of Engineering, Computing and Applied Sciences Dean's Graduate Student Advisory Board, 2019-2022*
- *CUHackit Hackathon Judge, Clemson University, 2020, 2022*
- *President, School of Computing Graduate Student Association, Clemson, 2017-2019*
- *Bebras Computing Challenge Volunteer, Clemson, SC, Spring 2017, 2018*

- *President*, WCU Association of Computing Machinery (ACM) Chapter, 2013-2015
- *Volunteer*, Lego Summit, Western Carolina University, Spring 2013
- *Clinic & IT Volunteer*, Harris Regional Hospital, 2008 & 2009

PUBLICATIONS

Peer-Reviewed Publications

- Google Scholar
- **Tyler Allen**, Rong Ge, “In-Depth Analyses of Unified Virtual Memory System for GPU Accelerated Computing”, Supercomputing 2021
- **Tyler Allen**, Rong Ge, “Demystifying GPU UVM Cost with Deep Runtime and Workload Analysis”, In Proceedings of the International Parallel & Distributed Processing Symposium (IPDPS 2021)
- Thomas Randall, **Tyler Allen**, Rong Ge, “FULL-W2V: Fully Exploiting Data Reuse for W2V on GPU-Accelerated Systems”, International Conference on Supercomputing 2021 (ICS 2021), **Best Paper Award**
- Rong Ge, Xizhou Feng, **Tyler Allen**, Pengfei Zou, “The Case for Cross-Component Power Coordination on Power Bounded Systems”, IEEE Transactions on Parallel and Distributed System (TPDS 2021)
- **Tyler Allen**, Xizhou Feng, Rong Ge, “Slate: Enabling Workload-Aware Efficient Multiprocessing”, In Proceedings of the International Parallel & Distributed Processing Symposium (IPDPS 2019)
- **Tyler Allen**, Christopher Daley, Doug Doerfler, Brian Austin, Nicholas Wright, “Performance and Energy Usage of Workloads on KNL and Haswell Architectures”, In Proceedings of the International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computing Systems (PMBS 2017).
- Pengfei Zou, **Tyler Allen**, Claude H. Davis IV, Xizhou Feng Rong Ge, “CLIP: Cluster-Level Intelligent Power Coordination for Power-Bounded Systems”, In Proceedings of the International Conference on Cluster Computing (CLUSTER 2017).
- **Tyler Allen**, Rong Ge, “Characterizing Power and Performance of GPU Memory Access”, In Proceedings of the 4th International Workshop on Energy Efficient Supercomputing (E2SC 2016).
- Andrew T. Duchowski, Sophie Jörg, **Tyler N. Allen**, Ioannis Giannopoulos, Krzysztof Krejtz. “Eye movement synthesis”, In Proceedings of the Ninth Biennial ACM Symposium on Eye Tracking Research & Applications (ETRA 2016).

In Preparation

- **Tyler Allen**, Rong Ge, “Asynchronous Page Unmapping for Efficient Unified Memory”
- **Tyler Allen**, Bennett Cooper, Rong Ge, “In-Depth Analyses of Unified Virtual Memory System for GPU Accelerated Systems and GPU P2P”, Journal Extension for GPU P2P
- **Tyler Allen**, Rong Ge, “Eviction Methodologies for Oversubscribed Unified Memory Systems”
- Rong Ge, **Tyler Allen**, “Power-Bounded Speedup for Heterogeneous Systems”

Accepted Posters

- **Tyler Allen**, Rong Ge, “Holistic Performance Analysis and Optimization of Unified Virtual Memory”, Doctoral Showcase Poster, Supercomputing 2021
- **Tyler Allen**, Xizhou Feng, Rong Ge, “Optimizing Performance in Power Bounded GPU Computing”, ACM Graduate Student Research Poster Competition, Supercomputing 2020
- Bennett Cooper, Derek Rodriguez, **Tyler Allen**, Thomas Randall, Rong Ge, “Learning Page Access Patterns for Algorithms Programmed with GPU UVM”, ACM Undergraduate Research Poster Competition, Supercomputing 2019

INVITED TALKS

- “In-Depth Analyses of Unified Virtual Memory System for GPU Accelerated Computing”, Supercomputing, November 2021

- “Holistic Performance Analysis and Optimization of Unified Virtual Memory”, Doctoral Showcase, Supercomputing 2021
- “Demystifying GPU UVM Cost with Deep Runtime and Workload Analysis”, The 36th IEEE International Parallel and Distributed Processing Symposium (IPDPS), May 2021
- “Slate: Enabling Workload-Aware Efficient Multiprocessing”, The 34th IEEE International Parallel and Distributed Processing Symposium (IPDPS), May 2019
- “Beyond Moore’s Law with Heterogeneous Computing”, Western Carolina University, August 2018
- “Performance and Energy Usage of Workloads on KNL and Haswell Architectures”, The International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computing Systems, November 2017
- “Characterizing Power and Performance of GPU Memory Access”, 4th International Workshop on Energy Efficient Supercomputing, November 2016