Grant Wilkins

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Education

Cambridge University, Churchill College — Cambridge, UK
M.Phil in Advanced Computer Science — Expected Spring 2024

- Advisor: Prof. Richard Mortier
- Relevant Coursework: Federated Learning, Large Data Processing, Applied Machine Learning

Clemson University — Clemson, SC
Dual B.S in Computer Engineering and Mathematical Sciences — Spring 2023

- Thesis: "Green HPC: Optimizing Software Stack Energy Efficiency of Large Data Systems"
- Distinctions: Norris Medal, Summa Cum Laude, General and Departmental Honors
- Relevant Coursework: Control Systems, Linear Optimization, Algorithms, FPGAs, Embedded Systems, Operating Systems, Functional Programming, Algebra, Topology

Research Experience

Argonne National Laboratory, Visiting Researcher — Summer 2023
Advisors: Dr. Sheng Di, Dr. Franck Cappello, Dr. Robert Underwood

- Developer of *ThingSZ:* a highly efficient IoT-based lossy compressor for data reduction of floating point streams.

Clemson University, Undergraduate Researcher — Fall 2020 –Fall 2023
Advisor: Dr. Jon Calhoun

- Explores both IoT and HPC energy efficient strategies for data reduction and efficient storage solutions.
- Actively seeks new paradigms to make lossy compression more energy efficient in heterogeneous HPC systems
- Designed general lossy compressor framework to reduce energy consumption by 15%
- Developed system for examining the performance gap in synchronous and asynchronous checkpointing, finding 4× energy savings

REU: HPC Data Reduction, Clemson University — Summer 2020
Advisor: Dr. Jon Calhoun

- Explored ways to reduce the amount of energy consumed by the lossy compression in HPC workflows
- Compressed large datasets over various node architectures using DVFS
- Found strategies to lower HPC system energy consumption by 15% on average

USMA Department of Chemistry Research Assistant — Spring 2018 - Spring 2019
Advisor: Dr. Gary Washington

- Tested claims of room-temperature superconductivity in Au-Ag wires, finding no superconductivity in our variation over large voltage ranges.
- Simulated the conductivity of lithium nanowires by varying electrode composition using SIESTA and NWChem, leading to predictions of post-Moore's law behavior.

Industry Experience

Tesla, Inc., Software Engineering Intern — Summer 2021
Energy IoT Cloud Platforms Team — Palo Alto, CA

- Created mobile notifications service to over 20,000 California home batteries for Tesla Virtual Power Plant
- Implemented metrics pipeline for data analysis from over 500,000 IoT devices
- Expanded functionality for the Storm Watcher 2 application by integrating NWS weather alert ingestion

Publications

[1] **G. Wilkins** and J. C. Calhoun, "Modeling power consumption of lossy compressed i/o for exascale hpc systems", in *2022 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, Jun. 2022, pp. 1118–1126.

[2] **G. Wilkins**, M. J. Gossman, B. Nicolae, M. C. Smith, and J. C. Calhoun, "Analyzing the energy consumption of synchronous and asynchronous checkpointing strategies", in *2022 IEEE/ACM Third International Symposium on Checkpointing for Supercomputing (SuperCheck)*, Nov. 2022, pp. 1–9.

[3] **G. Wilkins** and J. C. Calhoun, "Modeling Energy Consumption for the SZ Compressor on HPC Systems", in *SC20*, Oct. 2020.

[4] **G. Wilkins**, "Temperature Independent, Computational Conductivity in Au-Ag Nanowire with Varying Magnetic Fields", *AP Research*, May 2019.

[5] **G. Wilkins** and G. Washington, "Variances in Quantum Electronic Characteristics: The Effects of Differing Li, Be, and Na Electrodes with Constant Scattering Regions", *Pioneer Academics*, vol. 5, no. 1, Jul. 2018.

Selected Presentations

[1] G. Wilkins (Presenter), "Analyzing the Energy Consumption of Synchronous and Asynchronous Checkpointing Strategies", International Conference on Supercomputing 2022, Nov. 2022.

[2] G. Wilkins (Presenter), "Modeling Power Consumption of Lossy Compressed I/O for Exascale HPC Systems", IPDPS: 3rd Workshop on Extreme-Scale Storage and Analysis, Jun. 2022.

[3] G. Wilkins (Presenter), "ACM SRC: Modeling Energy Consumption for the SZ Compressor on HPC Systems", SC20: ACM Student Research Competition, Oct. 2020.

Teaching

- **Undergraduate Teaching Assistant** at Clemson University — Fall 2020 - Fall 2021
  Held office hours, graded, and led class sessions for over 50 students each semester in ENGR 1410.

Skills

- **Programming Languages:** C/C++, Scala/Java, Python, VHDL, Go, OCaml, FORTRAN, Bash, SQL
- **Tools/Software:** MPI, CUDA, OpenCL, Kakfa, Tensorflow, MATLAB, Mathematica, LaTeX, Git, Excel, Kubernetes
- **Embedded Systems:** Arduino, Raspberry Pi, DE10 (FPGA), Onion Omega 2

Honors and Awards

- **Churchill Scholarship** Fully-funded Masters study at the University of Cambridge 2023
- **D.K. Norris Medal** Clemson University's highest honor awarded to one best all-around graduating senior 2023
- **National Scholars Program** Full academic scholarship and enrichment program at Clemson University 2019
- **NSF Graduate Research Fellowship** Three years of full funding for doctoral research 2023
- **Goldwater Scholar** 1 of 64 Engineering students within the national cohort of 417. 2022
- **Astronaut Scholar** 1 of 63 national STEM students awarded on basis of research and aptitude. 2022
- **Dixon Global Policy Scholars** Public policy focused discussions with faculty. 2020
- **Most Outstanding Junior: Clemson University College of Science** 2022
- **Most Outstanding Junior: Computer Engineering and Mathematics** 2022
- **National Merit Scholar** 2019
- **Eagle Scout Award** 2016

Leadership and Service

- Ring Ceremony Director of Student Alumni Council 2021–Present
  Coordinated and organized the ordering and distribution of 2000 Clemson class rings each semester. Managed $2.5 million in ordering costs and sales, and coordinated ceremonies with 5000+ attendees.
- Vice President of Blue Key Honor Society 2021–Present
  Raised $25,000 for scholarships and student emergency funds each semester through student programming.
- Mentor in Seniors Advising Sophomores in Honors 2022–Present
  Advised 10 Honors College sophomores about research, summer internships, and navigating involvement and service at Clemson University.
- Retreat Team Leader of National Scholars Program 2020–2022
  Leads retreat team that introduces incoming first-year students of the National Scholars' Program to Clemson University. Works on team building and different activities to ensure a cohesive cohort mentality.