Grant Wilkins

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Education

Stanford University Stanford, CA
Ph.D. in Electrical Engineering

- Advisors: Profs. Ram Rajagopal, Philip Levis
- Areas of Focus: Data Center and Energy Systems Interactions, Distributed Systems

University of Cambridge, Churchill College Cambridge, UK
M.Phil in Advanced Computer Science July 2024

- Thesis: "Online Workload Allocation and Energy Optimization in Large Language Model Inference Systems"
- Advisors: Profs. Richard Mortier, Srinivasan Keshav

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

- Thesis: "Green HPC: Optimizing Software Stack Energy Efficiency of Large Data Systems"
- Distinctions: Norris Medal, Summa Cum Laude, General and Departmental Honors

Research Experience

Microsoft Azure Research, Research Intern Summer 2025
Advisors: Fiodar Kazamiaka, Chaojie Zhang

- Explored and proposed designs for power and infrastructure layout for next-generation data centers.

Argonne National Lab, Graduate Research Assistant Summer 2024
Advisors: Sheng Di, Franck Cappello

- Quantified the energy-savings that lossy compression can introduce for exascale computing systems.

University of Cambridge, Graduate Research Student Fall 2023–Summer 2024
Advisors: Richard Mortier, Srinivasan Keshav

- Developed an energy-aware online scheduling framework for LLM inference.

Argonne National Laboratory, Graduate Research Assistant Summer 2023
Advisors: Sheng Di, Franck Cappello, Kibaek Kim

- Principal investigator for FedSZ: a lossy compression scheme to cut federated learning communication overhead.
- Contibuted to APPFL, SZx, SZ3 projects through expanded ML capabilities and library compatibility.

Clemson University, Undergraduate Researcher Fall 2020 –Summer 2023
Advisor: Jon Calhoun

- Explored lossy compression for HPC and edge towards reducing system I/O energy and runtime overhead.
- Examined and modeled relevant HPC data checkpointing strategies and exploited 4× energy savings.

NSF-REU: HPC Data Reduction, Clemson University Summer 2020
Advisor: Jon Calhoun

- Created ab initio prediction models for floating-point lossy compressor energy consumption using DVFS.

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
- Expanded functionality for the Storm Watcher 2 application by integrating NWS weather alert ingestion

Publications

[1] **G. Wilkins**, S. Di, R. Calhoun Jon C. Underwood, and F. Cappello, "To compress or not to compress: Energy trade-offs and benefits of lossy compressed i/o", in *2025 IEEE 39th International Parallel and Distributed Processing Symposium (IPDPS)*, 2025.

[2] S. Di, J. Liu, K. Zhao, X. Liang, R. Underwood, Z. Zhang, M. Shah, Y. Huang, J. Huang, X. Yu, C. Ren, H. Guo, **G. Wilkins**, D. Tao, J. Tian, S. Jin, Z. Jian, D. Wang, M. H. Rahman, B. Zhang, J. C. Calhoun, G. Li, K. Yoshii, K. A. Alharthi, and F. Cappello, "A survey on error-bounded lossy compression for scientific datasets", 2024. arXiv: 2404.02840 [cs.DC].

[3] **G. Wilkins**, S. Di, J. C. Calhoun, Z. Li, K. Kim, R. Underwood, R. Mortier, and F. Cappello, "Fedsz: Leveraging error-bounded lossy compression for federated learning communications", in *2024 IEEE 44th International Conference on Distributed Computing Systems (ICDCS)*, 2024, pp. 577–588.

[4] **G. Wilkins**, S. Keshav, and R. Mortier, "Hybrid heterogeneous clusters can lower the energy consumption of llm inference workloads", in *Proceedings of the 15th ACM International Conference on Future and Sustainable Energy Systems*, ser. e-Energy '24, New York, NY, USA: Association for Computing Machinery, 2024, pp. 506–513, ISBN: 9798400704802.

[5] **G. Wilkins**, S. Keshav, and R. Mortier, "Offline energy-optimal llm serving: Workload-based energy models for llm inference on heterogeneous systems", in *Proceedings of the 3rd Workshop on Sustainable Computer Systems*, ser. HotCarbon'24, New York, NY, USA: Association for Computing Machinery, 2024.

[6] **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.

[7] **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.

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++, Python, Scala/Java, VHDL, Go, OCaml, FORTRAN, Bash, SQL
- **Tools/Software:** MPI, OpenMP, CUDA, PyTorch, MATLAB, Mathematica, LaTeX, Git
- **Embedded Systems:** Arduino, Raspberry Pi, NVIDIA Jetson, DE10 (FPGA), Onion Omega 2

Honors and Awards

- **Churchill Scholarship** Fully-funded Masters study at the University of Cambridge — 2023

- **NSF Graduate Research Fellowship**[*] Three years of full funding for doctoral research. 2023
  [*]*Awarded but vacated for Churchill Scholarship.*
- **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
- **Goldwater Scholar** 1 of 64 Engineering students within the national cohort of 417. 2022
- **Astronaut Scholar** 1 of 68 national STEM students awarded on basis of research and aptitude. 2022
- **Most Outstanding Undergraduate in Research: Clemson University College of Science** 2023
- **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