

Ben Wilfong

1 Basic Information

Title: Graduate Research Assistant

Institution: Georgia Institute of Technology

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GitHub: github.com/wilfonba

Research Interests: Computational fluid dynamics, hydrodynamic instability, multiphase fluid dynamics, high performance computing, GPU accelerated modeling and simulation

2 Education

- Georgia Institute of Technology
(In Progress) Doctor of Philosophy, Computational Science and Engineering
Advisor: Dr. Spencer Bryngelson
Relevant coursework: High Performance Computing (S24), Turbulent Fluid Flows (S24), Iterative Methods for Systems of Equations (F23), Numerical Linear Algebra (S23), Viscous Fluid Flows (F22)
- Rose-Hulman Institute of Technology
(2022) Bachelor of Science, Mechanical Engineering and Computational Science

3 Experience

- Weapons and Complex Integration Intern June 2022 – August 2022
Institution: Lawrence Livermore National Laboratory
Supervisor: Dr. Kyle Sinding
Duties: Perform finite element simulation using LLNL's HPC resources using ALE3D, generate case files and input data, post-process data to gather useful quantities of interest like shock wave arrival time and pressure profiles
- EERE High Performance Computing for Manufacturing Intern June 2021 – August 2021
Institution: Lawrence Livermore National Laboratory in collaboration with Oak Ridge Institute for Science and Education (ORISE)
Supervisor: Dr. John Karnes
Duties: Perform molecular dynamics simulations using LLNL's HPC resources using LAMMPS, generate case files and input data, post-process data to gather useful quantities of interest like reaction rates and percent conversion

4 Awards

- (2024) CRNCH Fellowship for Novel Computing Paradigms and Hierarchies
- (2022) Georgia Tech Presidents Fellowship
- (2018-22) Deans List, Rose-Hulman Institute of Technology

5 Professional activity

5.1 Memberships

- (2024-Present) Association for Computing Machinery (ACM), Member
- (2024-Present) American Physical Society (APS), Member

6 Service and Outreach

- (2023-Present) Presidents undergraduate research award reviewer
- (2023-Present) CSE Graduate Student Association vice-president
- (2022-23) CSE Graduate Student Association events officer

7 Publications

7.1 Archival, heavily referred papers

- [P1] A. Radhakrishnan, H. Le Berre, B. Wilfong, J.-S. Spratt, M. Rodriguez Jr., T. Colonius, and S. H. Bryngelson (2024). “Method for portable, scalable, and performant GPU-accelerated simulation of multiphase compressible flow”. In: *Computer Physics Communications* 302, p. 109238. DOI: [10.1016/j.cpc.2024.109238](https://doi.org/10.1016/j.cpc.2024.109238)

7.2 Conference papers

- [C2] B. A. Wilfong, R. McMullen, T. Koehler, and S. H. Bryngelson (n.d.). “Instability of Two-Species Interfaces via Vibration”. In: *AIAA AVIATION FORUM AND ASCEND 2024*. DOI: [10.2514/6.2024-4480](https://doi.org/10.2514/6.2024-4480)
- [C1] B. Wilfong, A. Radhakrishnan, H. A. Le Berre, S. Abbott, R. D. Budiardja, and S. H. Bryngelson (2024). “OpenACC offloading of the MFC compressible multiphase flow solver on AMD and NVIDIA GPUs”. In: *Proceedings of the SC '24 Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis*. DOI: [10.48550/arXiv.2409.10729](https://doi.org/10.48550/arXiv.2409.10729)

7.3 Abstracts

- [A2] B. Wilfong, T. Chu, R. McMullen, T. Koehler, and S. H. Bryngelson (2024). “Hydrodynamic instability and breakup of a liquid-gas interface via vibration”. In: *74th Annual Meeting of the APS Division of Fluid Dynamics (APS DFD)*. Salt Lake City, UT
- [A1] B. Wilfong, A. Radhakrishnan, and S. H. Bryngelson (2024). “Multiphase flow numerics: Perspectives from exascale simulation”. In: *5th International Conference on Numerical Methods for Multiphase Flow (ICNMMF)*. Reykjavik, Iceland

8 Skills

- *Programming Languages/Paradigms*: Fortran, OpenACC, MPI, Matlab, Bash
- *Software and Tools*: Paraview, VisIt, Solidworks, SLURM, PBS, Nsys Systems, Nsight Compute, RocProf, Omniperf, fypp