Jackson Vanover

Researcher with a strong mathematics background, focused on analysis and optimization of numerical software in the field of high-performance computing.

Education

Pursuing	**PhD in Computer Science** *at University of California, Davis*
2018 to 2020	**MS in Computer Science** *at University of California, Davis*, GPA: 4.0
2012 to 2016	**BA in Mathematics** *at University of California, Santa Cruz*, Major GPA: 3.92

Experience

Jan 2019 to Present — **Graduate Researcher** *with the UCD-PLSE Research Group*, UC Davis
Focus on designing strategies and developing tools for numerical software with an emphasis on the correctness and performance of floating-point computation in high-performance computing applications.

Summer '21,'22 — **Graduate Student Computing Researcher**, Lawrence Livermore National Laboratory
Researching novel techniques for the analysis of numerical software to facilitate the optimization of high-performance computing applications via approximation. Ongoing collaboration.

Sep 2018 to June 2019 — **Teaching Assistant** *for Data Structures/Algorithms and Programming Languages*, UC Davis
Two separate appointments for two classes over three quarters. Nominated for Outstanding Graduate Teaching Award for work in Data Structures and Algorithms.

Selected Projects

Feb 2020 to Present — **Prose: Optimizing the Performance of Large-Scale Climate Modeling Software**
Working in collaboration with the Climate & Global Dynamics Laboratory at the National Center for Atmospheric Research to devise a strategy and implement a tool that performs automated and scalable optimizations of the Community Earth System Model.

Jan 2019 to August 2020 — **FPDiff: Automated Differential Testing for Bug-Finding in Numerical Libraries**
Led a team focused on improving the robustness of numerical software that resulted in the development of FPDiff, a tool for automated differential testing of numerical libraries. Authored research paper on the tool and its results, published in the proceedings of the 2020 International Symposium on Software Testing and Analysis with an accompanying "Distinguished Artifact" award.

Publications

Vanover, Jackson, Xuan Deng, and Cindy Rubio-González. "Discovering discrepancies in numerical libraries." Proceedings of the 29th ACM SIGSOFT International Symposium on Software Testing and Analysis. 2020.

Parasyris, Konstantinos, James Diffenderfer, Harshitha Menon, Ignacio Laguna, **Jackson Vanover**, Ryan Vogt, and Daniel Osei-Kuffuor. "Approximate computing through the lens of uncertainty quantification." In SC22: International Conference for High Performance Computing, Networking, Storage and Analysis. 2022.

Menon, Harshitha, James Diffenderfer, Giorgis Georgakoudis, Ignacio Laguna, Michael O. Lam, Daniel Osei-Kuffuor, Konstantinos Parasyris, and **Jackson Vanover**. "Approximate High-Performance Computing: A Fast and Energy-Efficient Computing Paradigm in the Post-Moore Era." IT Professional 25, no. 2 (2023)

References

Dr. Harshita Menon	*Advisor at LLNL // (650) 741-4260 // harshitha@llnl.gov*
Dr. Cindy Rubio-González	*Advisor at UCD // (530) 752-7069 // crubio@ucdavis.edu*
Dr. Alper Altuntas	*Collaborator at NCAR // (919) 649-9980 // altuntas@ucar.edu*

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