Dolores Miao

University of California, Davis
Department of Computer Science
2356 Academic Surge, Davis, CA 95616

Other name(s): Wenjun Miao
https://doloresmiao.github.io/
wjmiao (at) ucdavis.edu

Education

University of California, Davis — Sept 2020 – Present (to graduate in Spring 2026)
Computer Science, PhD — *Davis, CA, USA*

Fudan University — Sept 2003 – July 2007
Communication Science and Engineering, BEng — *Shanghai, China*

Research Experience

Graduate Student Researcher — July 2021 – Present
University of California, Davis — *Davis, CA, USA*

- Academic Advisor: Cindy Rubio-González
- Use various tools (ROSE Compiler, LLVM IR, Clang plugins, scikit-learn, PyTorch, C++ and Python) to detect floating-point correctness issues in scientific programs.

Computer Science Graduate Intern — June 2024 – Sept 2024
Lawrence Livermore National Laboratory — *Livermore, CA, USA*

- Developed a tool that detects floating-point exceptions in AMD HIP kernels.

Computer Science Graduate Intern — June 2023 – Sept 2023
Lawrence Livermore National Laboratory — *Livermore, CA, USA*

- Worked on software testing with source code mutations in OpenMP program directives in order to generate program variants with performance speedup.

Computer Science Graduate Intern — June 2022 – Sept 2022
Lawrence Livermore National Laboratory — *Livermore, CA, USA*

- Floating-point correctness research projects.

Research Publications

1. [ISC 2023] Miao, D., Laguna, I., & Rubio-González, C. (2023, May). **Expression Isolation of Compiler-Induced Numerical Inconsistencies in Heterogeneous Code**. In International Conference on High Performance Computing.

2. [PMAM@PPoPP 2024] Miao, D., Laguna, I., Georgakoudis, G., Parasyris, K., & Rubio-González, C. (2024). **MUPPET: Optimizing Performance in OpenMP via Mutation Testing**. In Proceedings of the 15th International Workshop on Programming Models and Applications for Multicores and Manycores.

3. [ICS 2024] Miao, D., Laguna, I., & Rubio-González, C. (2024, June). **Input Range Generation for Compiler-Induced Numerical Inconsistencies**. In International Conference on Supercomputing.

4. [PARCO] Miao, D., Laguna, I., Georgakoudis, G., Parasyris, K., & Rubio-González, C. (2024, August). **An Automated OpenMP Mutation Testing Framework for Performance Optimization**. In Parallel Computing, Volume 121.

5. [HPDC 2025] Miao, D., Laguna, I., & Rubio-González, C. (2025, July). **FloatGuard: Efficient Whole-Program Detection of Floating-Point Exceptions in AMD GPUs**. To Appear in the 34th ACM International Symposium on High-Performance Parallel and Distributed Computing.

Awards & Honors

Hans Mauer Award for Best Research Paper 2023
ISC High Performance

Director's Excellence in Publication Awards 2024
Lawrence Livermore National Laboratory

- Both are awarded for the paper "Expression Isolation of Compiler-Induced Numerical Inconsistencies in Heterogeneous Code".

Teaching Experience

Teaching Assistant - ECS 140A: Programming Languages Spring 2023—2025
University of California, Davis *Davis, CA, USA*

- Instructor: Cindy Rubio-González
- Programming langauges syntax and parsing (BNF/EBNF, AST). Comparison between different program language paradigms: Go, LISP, Prolog. Concurrent Go programming and data race detection.
- In charge of grading homeworks and exams, holding discussion sessions on homework and exam solutions, and office hours.

Lectures & Talks

Tutorial Session Nov 2024
International Conference for HPC, Networking, Storage, and Analysis (SC'24) *Atlanta, GA, USA*

- Presenting at tutorial: Tools to Diagnose and Repair Floating-Point Errors in Heterogeneous Computing Hardware and Software (Ciel tool demo)

Tutorial Session Nov 2025
International Conference for HPC, Networking, Storage, and Analysis (SC'25) *St. Louis, MO, USA*

- Presenting at tutorial: Tools to Diagnose and Repair Floating-Point Errors in Heterogeneous Computing Hardware and Software (FloatGuard tool demo)

Industry & Other Experience

Assistant Technical Director Jan 2017 - Feb 2021
Virtuos Games *Shanghai, China*

Lead Software Engineer (C/C++) Aug 2011 - Dec 2016
Virtuos Games *Shanghai, China*

Software Engineer (C/C++) Feb 2007 - Jul 2011
Virtuos Games *Shanghai, China*

Assistant Technical Director work summary:

- Work with teams and technical director to make technical decisions with regard to project proposals and technical design documents for projects
- Managing teams, tracking work progress and career growth of team members
- Feasibility research, feature implementation (rendering features, shader implementations, game engine programming, job scheduler, CPU/GPU/IO performance optimizations), and fixing critical bugs

Projects under lead roles:

- The Outer Worlds: Spacer's Choice Edition (PS5, Xbox Series, 2020–2021)
- Tales from the Borderlands (Switch, 2020)
- Bioshock Infinite (Switch, 2019–2020)
- XCOM 2 Collection (Switch, 2019–2020)
- Final Fantasy XII Zodiac Age (PS4, PC, Switch & Xbox one, 2015–2019)
- FINAL FANTASY X|X-2 HD Remaster (PS3, PSVita, PS4, PC, Switch & Xbox one, 2012–2019)

Other projects:

- MLB 2K12 (DS, PSP, PS2, Wii, 2012)
- Hole in the Wall (Xbox 360, 2011)
- Who wants to be a millionaire? (PS3, 2011)
- Tom Clancy's Ghost Recon Predator (PSP, 2009–2010)
- Crash: Mind over Mutant (PSP, 2008)
- Beowulf: The Game (PSP, 2007)

Specialized Skills

Programming Languages: C/C++/C# (advanced), Python/Go (intermediate)
Tools: CUDA, ROCm/HIP, PyTorch, scikit-learn, Shader languages (HLSL/GLSL), OpenGL, Direct3D 11
Skills: parallel programming with pthread, OpenMP; Clang plugins, LLVM passes