Mitch H. Briles

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EDUCATION

The University of Utah, Salt Lake City, UT *Aug 2023 - Present*

- *B.S. in computer science* and *B.S. in applied mathematics* — Dec 2026
- *Relevant courses*: scientific computing, machine learning, algorithms, data structures, numerical linear algebra, multivariable calculus, real analysis, computer systems, engineering probability & statistics, compilers, numerical analysis, interactive computer graphics, advanced OS
- *Honors*: Dean's list, UofU College of Engineering *Every Semester Fall 2023 - Present*

EXPERIENCE

Regehr Compiler Group, University of Utah, Salt Lake City, UT *Jan 2025 - Present*

- Researching compiler optimization (HPC) and correctness
- Working with LLVM IR to find miscompilations and additional optimizations
- Translation validation for ARM and RISC-V, writing LLVM passes (C++)

CS and Math Tutor, University of Utah, Salt Lake City, UT *Jan 2024 - Present*

- Guiding hundreds of students to success in math and computer science

PUBLICATIONS

Berger, R., Briles, M., Bushehri, N., Coughlin, N., Lam, K., Lopes, N. P., Mada, S., Tirpankar, T., & Regehr, J. (2025). **Translation validation for LLVM's AArch64 backend**. *Proceedings of the ACM on Programming Languages, OOPSLA.*

SKILLS

Programming Languages: C, C++, C#, Python, Java, Swift, R, MATLAB, LaTeX, Rust, ASM, GLSL
Tools: LLVM, IntelliJ, Visual Studio, VS Code, GitHub, Docker, GCC, Excel, WinForms, SQL
APIs/Libraries: OpenGL, Vulkan, SDL, .NET MAUI, PyTorch, TensorFlow, Qiskit, CUDA
Operating Systems

- *Windows:* PowerShell, Command Prompt, Windows APIs, Batch, driver development
- *Unix:* Arch Linux, Debian (Ubuntu), CLI, Bash, shell scripting, Linux kernel development

Security: Binary(executable) patching, process hacking, thread hijacking, DLL injection, jailbreaking
Other Passions: Embedded C, embedded Linux, Raspberry Pi, robotics controllers using Python, Backend engineering, aerospace, OS implementation, iOS jailbreaking, compilers/interpreters, MLIR

PROJECTS

2D Gravity Simulation Engine — C, SDL

- Built a 2D rendering engine in C.
- Created a custom physics engine to handle complex n-body systems with collisions from scratch

Video Game Server Network — C#

- Wrote, updated, and optimized plugins; some existing, some from scratch
- Thousands of players joined the servers every day, and thousands of developers used my plugins