

Bhargav Kulkarni

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Education

University of Utah

2023—Present

PhD, Computer Science

- Advised by [Pavel Panchekha](#)

BITS Pilani

2019—2023

BEng, Computer Science

Publications

Semantics for 2D Rasterization

OOPSLA'26

[Bhargav Kulkarni](#), Henry Whiting, Pavel Panchekha

- Formalized Skia's 2D rasterization semantics in Lean and built a verified optimizer that achieves an average speedup of 18.7% across the top 100 websites by traffic.

Mixing Condition Numbers and Oracles for Accurate Floating-point Debugging

IEEE ARITH'25

[Bhargav Kulkarni](#), Pavel Panchekha

- Built a floating-point debugger combining double-double arithmetic, condition numbers, and logarithmic oracles, achieving 80.0% precision and 96.1% recall on 546 difficult numeric benchmarks.
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Employment

Adobe Inc.

2026

Graduate Research Intern

- Building an optimizer for scene-graphs in Adobe Photoshop

University of Utah

2023—Present

Research Assistant

- Currently building a verified optimizer for the Skia vector graphics engine that powers Chrome rendering.
 - Formalized Skia's semantics in the Lean theorem prover to verify optimizing rewrites.
- Previously adapted floating-point static analysis techniques to build an accurate floating-point debugger.

NASA Langley Formal Methods Group

2024

Research Intern

- Worked on generating proof certificates for the PVS automated theorem prover to verify Herbie's (a floating-point superoptimizer) accuracy-aware optimizations
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Skills and Projects

- **General Programming:** Python, Racket, Java
- **Systems Programming:** C/C++ , Bash, Rust
- **Hardware:** Verilog, x86

- **Trinity Game Engine:** A game engine and byte code VM for scripting. [\[source\]](#)
- **Logic in Coq:** Classical propositional logic and natural deduction in Coq/Rocq. [\[source\]](#)
- **CheemScheme:** Scheme dialect in C++ with tail recursion and error reporting. [\[source\]](#)