

Ian Briggs

PhD Candidate in Computer Science
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My research uses modern verification and synthesis tools to write high-performance, accurate numerical code. I have experience with automated reasoning tooling such as SAT, SMT, and ILP as well as LLVM tooling.

EDUCATION

University of Utah—Ph. D.
Computer Science
August 2020 - Present

University of Utah—B.S/M.S.
Computer Science
August 2010 - May 2016

EXPERIENCE

University of Utah, Salt Lake City, UT — Research Associate
2016 - Present

Amazon Automated Reasoning, Seattle, WA — Summer Intern
2022

LLNL, Livermore, CA — Outside Collaborator
2018 - 2019

PUBLICATIONS

Synthesizing Mathematical Identities with E-Graphs — CoRR
2022 Briggs, Panchekha

Choosing Mathematical Function Implementations for Speed and Accuracy — PLDI
2022 Briggs, Panchekha

Keeping Science on Keel When Software Moves — CACM
2021 Ahn, Baker, Bentley, Briggs, Gopalakrishnan, Hammerling, Laguna, Lee, Milroy, Vertenstein

FailAmp: Relativization Transformation for Soft Error Detection in Structured Address Generation — TACO
2020 Briggs, Baranowski, Das, Sharma, Krishnamoorthy, Rakamaric, Gopalakrishnan

FPDetect: Efficient Reasoning About Stencil Programs Using Selective Direct Evaluation. — TACO
2020 Das, Krishnamoorthy, Briggs, Gopalakrishnan, Tipireddy

ArcherGear: data race equivalencing for expeditious HPC debugging — PPOPP
2020 Thayer, Gopalakrishnan, Briggs, Bentley, Ahn, Laguna, Lee

Scalable Yet Rigorous Floating-Point Error Analysis— SC
2020 Das, Briggs, Gopalakrishnan, Krishnamoorthy, Panchekha,

Rigorous Estimation of Floating-Point Round-Off Errors with Symbolic Taylor Expansions — TOPLAS
2019 Solovyev, Baranowski, Briggs, Jacobsen, Rakamaric, Gopalakrishnan

DiffTrace: Efficient Whole-Program Trace Analysis and Diffing for Debugging — CLUSTER
2019 Taheri, Briggs, Burtscher, Gopalakrishnan

Multi-Level Analysis of Compiler-Induced Variability and Performance Tradeoffs — HPDC
2019 Bentley, Briggs, Gopalakrishnan, Ahn, Laguna, Lee, Jones

FLiT: Cross-platform floating-point result-consistency tester and workload — IISWC
2017 Sawaya, Bentley, Briggs, Gopalakrishnan, Ahn

Moving the Needle on Rigorous Floating-Point Precision Tuning. — NFM
2017 Baranowski, Briggs, Chiang, Gopalakrishnan, Rakamaric, Solovyev

Rigorous floating-point mixed-precision tuning. — POPL
2017 Chiang, Baranowski, Briggs, Solovyev, Gopalakrishnan, Rakamaric