

JAY P. LIM

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RESEARCH INTERESTS

My research interests lie in generating and verifying low-level systems that include, but are not limited to, compilers, cryptography libraries, and math libraries. I am especially interested in developing foundational principles to automatically generate and verify these systems with minimal user intervention. In my current research, I am developing novel approaches to create efficient and correctly rounded math libraries for various representations.

EDUCATION

2021	PhD in Computer Science (expected) Rutgers University, New Brunswick, New Jersey Advisor: Santosh Nagarakatte
2011	BS in Computer Science and Mathematics University of Wisconsin - Madison, Madison, Wisconsin

HONORS AND AWARDS

2019	Rutgers University Rizvi Family Graduate Fellowship For excellence in research
2018	Student Research Competition Gold Medal, PLDI 2018 Title: Automatic Verification of Assembly Implementation of Cryptographic Algorithms

POSITIONS HELD

2014-present	Graduate Research Assistant Computer Science Department, Rutgers University
2017	Research Intern MSR Next OS Technology, Microsoft Research Redmond - Developed generic functions for CheckedC to reduce void pointer usage.
2011-2014	Software Developer Quad/Graphics Inc. - Developed server back-end, web applications, and maintained large databases. - Directed task design, documentation, development, and code testing.

SCIENTIFIC PUBLICATIONS

PLDI 2021	<i>High Performance Correctly Rounded Math Libraries for 32-bit Floating Point Representations.</i> Jay P. Lim and Santosh Nagarakatte To appear in PLDI, 2021.
POPL 2021	<i>An Approach To Generate Correctly Rounded Math Libraries for New Floating Point Variants.</i> Jay P. Lim , Mridul Aanjaneya, John Gustafson, and Santosh Nagarakatte 48th ACM SIGPLAN Symposium on Principles of Programming Languages (POPL), 2021.

CF 2020	<p><i>Approximating Trigonometric Functions for Posits Using the CORDIC Method.</i> Jay P. Lim, Matan Shachnai, and Santosh Nagarakatte Proceedings of the 17th ACM International Conference on Computing Frontiers (CF), 2020.</p>
PLDI 2020	<p><i>Debugging and Detecting Numerical Errors in Computation with Posits.</i> Sangeeta Chowdhary, Jay P. Lim, and Santosh Nagarakatte Proceedings of the 41st ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), 2020.</p>
CGO 2019	<p><i>Automatic Equivalence Checking for Assembly Implementations for Cryptography Libraries.</i> Jay P. Lim, and Santosh Nagarakatte Proceedings of the International Symposium on Code Generation (CGO), 2019.</p>
PLAS 2017	<p><i>Compiler Optimizations with Retrofitting Transformations: Is There a Semantic Mismatch?</i> Jay P. Lim, Santosh Nagarakatte, and Vinod Ganapathy ACM SIGSAC Workshop and Programming Languages and Analysis for Security (PLAS), 2017.</p>

INVITED TALKS AND CONFERENCE PRESENTATIONS

Oct. 2020	<p><i>An Approach to Generate Correctly Rounded Math Libraries for New Floating Point Variants.</i> Poster session at 2020 Virtual LLVM Developers' Meeting. October 2020. Online.</p>
Jun. 2020	<p><i>Creating Correctly Rounded Math Libraries for Real Number Approximations.</i> Invited talk at FPTalks 2020. June 2020 Online. (Video)</p>
Jun. 2020	<p><i>Approximating Trigonometric Functions for Posits Using the CORDIC Method.</i> Conference presentation at CF 2020. June 2020 Online.</p>
Feb. 2019	<p><i>Automatic Equivalence Checking for Assembly Implementations for Cryptography Libraries.</i> Conference presentation at CGO 2019. February 2019. Washington D.C.</p>
Nov. 2017	<p><i>Automatic Verification of Assembly Implementation of Crypto Software.</i> Invited talk at NJ Programming Languages and Systems Seminar. November 2017. Princeton University, New Jersey.</p>
Oct. 2017	<p><i>Compiler Optimizations with Retrofitting Transformations: Is there a Semantic Mismatch?</i> Conference presentation at PLAS 2017. October 2017. Dallas, Texas.</p>
Aug. 2017	<p><i>Filling The Void: Extending C to Eliminate the Use of Void Pointers in Practice.</i> End of the Internship Talk at Microsoft Research. August 2017. Microsoft Research Redmond, Washington.</p>

TEACHING EXPERIENCE

Fall 2020	Teaching Assistant at Rutgers University <i>Computer Architecture</i> (01:198:211)
Spring 2020	Teaching Assistant at Rutgers University <i>Computer Security</i> (01:198:544)
Summer 2019	Instructor at Rutgers University <i>Computer Architecture</i> (01:198:211)
Spring 2019	Co-Instructor at Rutgers University <i>Computer Security</i> (01:198:544)
Fall 2018	Teaching Assistant at Rutgers University <i>Computer Architecture</i> (01:198:211)
Spring 2018	Teaching Assistant at Rutgers University <i>Programming Languages and Compilers II</i> (01:198:516)
Summer 2015	Teaching Assistant at Rutgers University <i>Introduction to Discrete Structures II</i> (01:198:206)
Spring 2015	Teaching Assistant at Rutgers University <i>Principles of Programming Languages</i> (01:198:314)
Fall 2014	Teaching Assistant at Rutgers University <i>Principles of Programming Languages</i> (01:198:314)

MEMBERSHIP

- ACM Student member since 2018.