Yao Li

Tenure-Track Assistant Professor,
Computer Science,
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Research Summary

My research aims to (1) advance the state of the art of verification on real-world software and (2) make verification easier to use from a *programming languages* perspective.
My research has been published in premier conferences on programming languages and formal verification, such as ICFP, ITP, and CPP.

Research Experience

Portland State University, Portland, OR, USA
Tenure-Track Assistant Professor, Sep. 2022 – present

Microsoft Research, Redmond, WA, USA
Research Intern, Jun. 2018 – Aug. 2018
Vale Project. Under supervision of Dr. Chris Hawblitzel

University of Lugano, Lugano, Ticino, Switzerland
Visiting Researcher, Mar. 2015 – Jun. 2015
Dynamic Analysis Group. Under supervision of Prof. Walter Binder

Industrial Experience

Microsoft, Shanghai, China
Software Development Engineer Intern, Jun. 2012 – Sep. 2012
Infrastructure team, under supervision of Zhiliang Xu

Education

University of Pennsylvania, Philadelphia, PA, USA
Ph.D. in Computer and Information Science, 2016 – 2022
Advisor: Prof. Stephanie Weirich

Shanghai Jiao Tong University, Shanghai, China
Master of Science in Engineering (Software Engineering), 2013-2016
Bachelor of Engineering (Software Engineering), 2009 – 2013
Advisor: Prof. Zhengwei Qi

Publications

Program Adverbs and Tlön Embedding
Yao Li, Stephanie Weirich
Proceedings of the ACM on Programming Languages, Volume 6 (**ICFP**), 2022, **Distinguished Paper Award**

Reasoning about the Garden of Forking Paths
Yao Li, Li-yao Xia, Stephanie Weirich
Proceedings of the ACM on Programming Languages, Volume 5 (**ICFP**), 2021

Ready, Set, Verify! Applying hs-to-coq to Real-World Haskell Code
Joachim Breitner, Antal Spector-Zabusky, **Yao Li**, Christine Rizkallah, John Wiegley, Joshua Cohen, Stephanie Weirich
Journal of Functional Programming (**JFP**), Volume 31, 2021, e5

Verifying an HTTP Key-Value Server with Interaction Trees and VST
Hengchu Zhang, Wolf Honoré, Nicolas Koh, **Yao Li**, Yishuai Li, Li-yao Xia, Lennart Beringer, William Mansky, Benjamin C. Pierce, Steve Zdancewic
The 12th International Conference on Interactive Theorem Proving (**ITP**), 2021, Rome, Italy (virtual conference, co-located with LICS 2021)

Verified Transformations and Hoare Logic: Beautiful Proofs for Ugly Assembly Language
Jay Bosamiya, Sydney Gibson, **Yao Li**, Bryan Parno, Chris Hawblitzel
The 12th Working Conference on Verified Software: Theories, Tools, and Experiments (**VSTTE**), 2020, Los Angeles, USA (virtual conference, co-located with CAV 2020 and ISSTA 2020)

A Scala Based Framework for Developing Acceleration Systems with FPGAs
Yanqiang Liu, **Yao Li**, Zhengwei Qi, Haibing Guan,
Journal of Systems Architecture (**JSA**), Volume 98, 2019

From C to Interaction Trees: Specifying, Verifying, and Testing a Networked Server
Nicolas Koh, **Yao Li**, Yishuai Li, Li-yao Xia, Lennart Beringer, Wolf Honoré, William Mansky, Benjamin C. Pierce, Steve Zdancewic
The 8th ACM SIGPLAN International Conference on Certified Programs and Proofs (**CPP**), 2019, Cascais, Portugal (co-located with POPL 2019)

Ready, Set, Verify! Applying hs-to-coq to Real-World Haskell Code (Experience Report)
Joachim Breitner, Antal Spector-Zabusky, **Yao Li**, Christine Rizkallah, John Wiegley, Stephanie Weirich
Proceedings of the ACM on Programming Languages, Volume 2 (**ICFP**), 2018

AutoBench: Finding Workloads That You Need Using Pluggable Hybrid Analyses
Yudi Zheng, Andrea Rosà, Luca Salucci, **Yao Li**, Haiyang Sun, Omar Javed, Lubomír Bulej, Lydia Y. Chen, Zhengwei Qi, Walter Binder
The 23rd IEEE International Conference on Software Analysis, Evolution, and Reengineering (**SANER**), 2016, Osaka, Japan

ScalaHDL: Express and Test Hardware Designs in a Scala DSL
Yao Li, Antonio Roldao Lopes, Zhouyun Xu, Zhengwei Qi, Haibing Guan
The 32nd IEEE International Conference on Computer Design (**ICCD**), 2014, Seoul, Korea

Talks

Program Adverbs and Tlön Embeddings
LSD seminar at University of California, Santa Cruz, virtual talk, 2022

The Expression Problem and Theorem Proving
Workshop on the Implementation of Type Systems (WITS), co-located with POPL, Philadelphia, PA, 2022

Effect-Oblivious Equivalence
Workshop on Principles of Secure Compilation (PriSC), co-located with POPL, Philadelphia, PA, 2022

Reasoning about the Garden of Forking Paths
POPV seminar at Boston University (Longer Version, Invited Talk), 2021
The ACM SIGPLAN International Conference on Functional Programming (ICFP), virtual talk, 2021
The ACM SIGPLAN Conference on Systems, Programming, Languages, and Applications: Software for Humanity (SPLASH), Chicago, IL, 2021

Embracing a Mechanized Formalization Gap: Interactive reasoning for Haskell at scale
Haskell Implementors' Workshop (HIW), co-located with ICFP, virtual talk, 2020

The Science of Deep Specification
NSF Expeditions in Computing - 10 Years of Transforming Science and Society, Washington, DC, 2018

Dependent Types in Scala
Philly Area Scala Enthusiasts Meetup (PHASE), Philadelphia, PA, 2017

Scala-Forklift: Type-Safe Data Migration Tool for Slick, Git and Beyond
Comcast Scala By the Schuyllkill Conference, Philadelphia, PA, 2017

Service

Program Committee: PLDI'23
Session Chair: SPLASH'21
Organizing Committee: SPLASH'22 (Student Volunteer Co-Chair)
Artifact Evaluation Committee: POPL'22, ICFP'21, POPL'21
Student Volunteer: CIS Doctoral Association at Penn (Spring 2021), Ph.D. Open House 2017 – 2020, ICFP'21, ICFP'20, DeepSpec Summer School'17