Qianchuan Ye

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Research Interests

I am broadly interested in interactive proof assistants, type theory and programming languages, program verification and synthesis, and language-based security. My research agenda revolves around developing language-based techniques to make it easier to write programs that require strong guarantees of correctness and security.

Education

- Purdue University
  Ph.D. in Computer Science, advised by Benjamin Delaware   *2017 – 2024*

- Sichuan University
  B.S. in Computer Science (top 1%)   *2009 – 2013*

Publications

Note: In recent years, the programming languages research community has been developing an additional review process for software artifacts that accompany a paper. This optional process typically awards the following badges:

[A] indicates the artifact is available on a publicly accessible archival repository,

[F] indicates the artifact was documented, consistent, complete, and exercisable with respect to the claims in the paper,

[R] indicates the artifact was of particularly high quality, such that reuse and repurposing is facilitated, and

[V] indicates the artifact can be used to replicate the main results of the paper.

- Taypsi: Static Enforcement of Privacy Policies for Policy-Agnostic Oblivious Computation
  Qianchuan Ye and Benjamin Delaware
  Proceedings of the 2024 ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA 2024)
  `https://doi.org/10.1145/3649861` [A][R][V]

- A HAT Trick: Type-based Verification of Representation Invariants Using Symbolic Finite Automata
  Zhe Zhou, **Qianchuan Ye**, Benjamin Delaware and Suresh Jagannathan
  Proceedings of the 45th ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2024)
  `https://doi.org/10.1145/3656433` [A][R]

- Taype: A Policy-Agnostic Language for Oblivious Computation
  Qianchuan Ye and Benjamin Delaware
  Proceedings of the 44th ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2023)
  `https://doi.org/10.1145/3591261` [A][R]

- Oblivious Algebraic Data Types
  Qianchuan Ye and Benjamin Delaware
  Proceedings of the 49th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL 2022)
  `https://doi.org/10.1145/3498713` [A][R]

- RHLE: Modular Deductive Verification of Relational ∀∃ Properties
  Robert Dickerson, **Qianchuan Ye**, Michael K. Zhang, and Benjamin Delaware
  Proceedings of the 20th Asian Symposium on Programming Languages and Systems (APLAS 2022)
  `https://doi.org/10.1007/978-3-031-21037-2_4` [A][F][R]

- HACCLE: Metaprogramming For Secure Multi-party Computation
  Yuyan Bao, Kirshanthan Sundararajah, Raghav Malik, **Qianchuan Ye**, Christopher Wagner, Fei Wang, Mohammad Hassan Ameri, Donghang Lu, Alexander Seto, Benjamin Delaware, Roopsha Samanta, Aniket Kate, Christina Garman, Jeremiah Blocki, Pierre-David Letourneau, Benoit Meister, Jonathan Springer, Tiark Rompf, Milind Kulkarni

Proceedings of the 20th ACM SIGPLAN International Conference on Generative Programming: Concepts and Experiences (GPCE 2021)
https://doi.org/10.1145/3486609.3487205

- Narcissus: Correct-by-Construction Derivation of Decoders and Encoders from Binary Formats
  Benjamin Delaware, Sorawit Suriyakarn, Clément Pit-Claudel, **Qianchuan Ye**, and Adam Chlipala
  Proceedings of the 24th ACM SIGPLAN International Conference on Functional Programming (ICFP 2019)
  http://doi.org/10.1145/3341686 ^{A F}

- A Verified Protocol Buffer Compiler
  Qianchuan Ye and Benjamin Delaware
  Proceedings of the 8th ACM SIGPLAN International Conference on Certified Programs and Proofs (CPP 2019)
  http://doi.org/10.1145/3293880.3294105

Workshops

- Scrap your boilerplate definitions in 10 lines of Ltac!
  Qianchuan Ye and Benjamin Delaware
  The Eighth International Workshop on Coq for Programming Languages (CoqPL 2022)
  https://github.com/ccyip/coq-idt

Dissertations

- Language-Based Techniques for Policy-Agnostic Oblivious Computation
  Qianchuan Ye
  PhD Dissertation, Purdue University, April 2024
  https://doi.org/10.25394/pgs.25676727.v1

Academic Service

Program Committee Member	*CoqPL 2025*
Artifact Evaluation Committee Member	*ICFP 2024*
External Reviewer	*CPP 2022*
Artifact Evaluation Committee Member	*ICFP 2022*
Artifact Evaluation Committee Member	*POPL 2020*

Teaching

Teaching Assistant, CS565: Programming Languages @Purdue	*Fall 2018 and Fall 2020*
Teaching Assistant, CS182: Foundations of Computer Science @Purdue	*Fall 2017, Spring 2018 and Spring 2021*

Industrial Employment

- TP-Link Technologies Co., Ltd.
  Software Engineer   *2013 – 2017*
  Embedded system development for networking devices; worked on Linux kernel, drivers and bootloaders, network protocols for roaming and QoS, software framework for routers, etc.

Awards and Honors

Phi Kappa Phi	*2024*
Bilsland Dissertation Fellowship	*2023 – 2024*
ACM SIGPLAN PAC Grant	*2022*
Purdue Graduate School Summer Research Grant	*2021*
China National Scholarship	*2012*
Third Prize, China National Mathematics Olympiad	*2008*