

# Ningning Xie

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## Professional Positions

- Aug 2023- **Assistant Professor.**  
University of Toronto, Toronto, Canada.
- Nov 2022- **Research Scientist.**  
Google Brain.
- Oct 2021-2022 **Research Associate.**  
University of Cambridge, Cambridge, UK.
- May-Sept 2021 **Research Intern.**  
DeepMind, London, UK (remote).
- Jan-Aug 2020 **Research Intern.**  
Microsoft Research, Redmond, WA.
- Aug-Nov 2019 **Software Engineer Intern.**  
Google, New York City, NY.

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## Education

- 2021 **Ph.D., Computer Science.**  
University of Hong Kong, Hong Kong
- 2015 **B.S. (with Honors), Computer Science and Technology.**  
Zhejiang University, Hangzhou, China

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## Grants, Awards, and Honors

- 2023-2028 NSERC Discovery Grant (\$217,500 CAD)
- 2021 ACM SIGPLAN Distinguished Paper Award (PLDI 2021)
- 2020 EECS Rising Stars, UC Berkeley
- 2020 ACM SIGPLAN Distinguished Paper Award (POPL 2020)
- 2020 Special issue of ACM Transactions on Programming Languages and Systems (TOPLAS)

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## Publications

- ICFP'23 **Ningning Xie**, Leo White, Olivier Nicole, Jeremy Yallop. **MacoCaml: Staging Composable and Compilable Macros**. *28th International Conference on Functional Programming*, ICFP 2023.
- PLDI'23 Jeremy Yallop, **Ningning Xie**, Neel Krishnaswami. **flap: A Deterministic Parser with Fused Lexing**. *44th Conference on Programming Language Design and Implementation*, PLDI 2023.
- APLAS'22 Xu Xue, Bruno C. d. S. Oliveira, **Ningning Xie**. **Applicative Intersection Types**. *20th Asian Symposium on Programming Languages and Systems*, APLAS 2022.
- OOPSLA'22 **Ningning Xie**, Youyou Cong, Kazuki, Ikemori, Daan Leijen. **First-class Names for Effect Handlers**. *37th ACM International Conference on Object-Oriented Programming, Systems, Languages, and Applications*, OOPSLA 2022.

- ECOOP'22 Baber Rehman, Xuejing Huang, **Ningning Xie**, Bruno C. d. S. Oliveira. **Union Types with Disjoint Switches**. *36th European Conference on Object Oriented Programming*, ECOOP 2022.
- MLSys'22 **Ningning Xie**, Tamara Norman, Diminik Grewe, Dimitrios Vytiniotis. **Synthesizing Optimal Parallelism Placement and Reduction Strategies on Hierarchical Systems for Deep Learning**. *5th Conference on Machine Learning and Systems*, MLSys 2022.
- POPL'22 **Ningning Xie**, Matthew Pickering, Andres Löb, Nicolas Wu, Jeremy Yallop, Meng Wang. **Staging with Class: A Specification for Typed Template Haskell**. *49th Symposium on Principles of Programming Languages*, POPL 2022.
- ICFP'21 **Ningning Xie**, Daan Leijen. **Generalized Evidence Passing for Effect Handlers: Efficient Compilation of Effect Handlers to C**. *26th International Conference on Functional Programming*, ICFP 2021.
- PLDI'21 **Ningning Xie\***, Alex Reinking\*, Leonardo de Moura, Daan Leijen. **Perceus: Garbage Free Reference Counting with Reuse**. *42nd Conference on Programming Language Design and Implementation*, PLDI 2021. *ACM SIGPLAN Distinguished Paper Award*
- Haskell'20 **Ningning Xie**, Daan Leijen. **Effect Handlers in Haskell, Evidently**. *13th Haskell Symposium*, Haskell 2020.
- ICFP'20 **Ningning Xie**, Jonathan Brachthäuser, Daniel Hillerström, Philipp Schuster, Daan Leijen. **Effect Handlers, Evidently**. *25th International Conference on Functional Programming*, ICFP 2020.
- POPL'20 **Ningning Xie**, Richard A. Eisenberg, Bruno C. d. S. Oliveira. **Kind Inference for Datatypes**. *47th Symposium on Principles of Programming Languages*, POPL 2020. *ACM SIGPLAN Distinguished Paper Award*
- ECOOP'20 **Ningning Xie**, Bruno C. d. S. Oliveira, Xuan Bi, Tom Schrijvers. **Row and Bounded Polymorphism via Disjoint Polymorphism**. *34th European Conference on Object Oriented Programming*, ECOOP 2020.
- TOPLAS'20 **Ningning Xie**, Xuan Bi, Bruno C. d. S. Oliveira, Tom Schrijvers. **Consistent Subtyping for All**. *ACM Transaction on Programming Languages and Systems*, TOPLAS 2020.
- ICFP'19 Gert-Jan Bottu, **Ningning Xie**, Koar Marntirosian, Tom Schrijvers. **Coherence of Type Class Resolution**. *24th International Conference on Functional Programming*, ICFP 2019.
- ESOP'19 Xuan Bi, **Ningning Xie**, Bruno C. d. S. Oliveira, Tom Schrijvers. **Distributive Disjoint Polymorphism for Compositional Programming**. *28th European Symposium on Programming*, ESOP 2019.
- ESOP'18 **Ningning Xie**, Xuan Bi, Bruno C. d. S. Oliveira. **Consistent Subtyping for All**. *27th European Symposium on Programming*, ESOP 2018. *Selected for Special Issue of ACM Transaction on Programming Languages and Systems*
- ESOP'18 **Ningning Xie**, Bruno C. d. S. Oliveira. **Let Arguments Go First**. *27th European Symposium on Programming*, ESOP 2018.
- Workshops
- PEPM'22 **Ningning Xie\***, Daniel D. Johnson\*, Dougal Maclaurin, Adam Paszke. **Parallel Algebraic Effect Handlers**. *ACM SIGPLAN Workshop on Partial Evaluation and Program Manipulation*, PEPM 2022, co-located with POPL 2022.
- HOPE'21 **Ningning Xie**, Youyou Cong, Daan Leijen. **First-class Names for Effect Handlers**. *ACM SIGPLAN Workshop on Higher-Order Programming with Effects*, HOPE 2021, co-located with ICFP 2021.
- HIW'18 **Ningning Xie**, Richard A. Eisenberg. **Coercion Quantification**. *10th Haskell Implementors' Workshop*, HIW 2018, co-located with ICFP 2018.

TFP'17 **Ningning Xie**, Bruno C. d. S. Oliveira. *Towards Unification for Dependent Types*. 18th Symposium on Trends in Functional Programming, TFP

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## Professional Activities

### Organizer

MFPS 2022 Special session organizer on algebraic effects. 38th International Conference on Mathematical Foundations of Programming Semantics

### Program Chair

HIW 2021 13th Haskell Implementors' Workshop

### Program Committee

PADL 2023 25th International Symposium on Practical Aspects of Declarative Languages

TFP 2023 24th Symposium on Trends in Functional Programming

PLDI 2023 44th Conference on Programming Language Design and Implementation

POPL 2023 50th Symposium on Principles of Programming Languages

SPLASH 2022 Student Research Competition (SRC), 37th ACM International Conference on Object-Oriented Programming, Systems, Languages, and Applications

ICFP 2022 27th International Conference on Functional Programming

FLOPS 2022 16th International Symposium on Functional and Logic Programming

TFP 2022 23rd Symposium on Trends in Functional Programming

Scala 2022 13th Scala Symposium

HOPE 2022 9th Workshop on Higher-Order Programming with Effects

ML 2022 9th Workshop on Higher-Order Programming with Effects

PADL 2021 23rd International Symposium on Practical Aspects of Declarative Languages

Haskell 2019 12th Haskell Symposium

HIW 2019 11th Haskell Implementor's Workshop

### Steering Committee

2020-2023 Haskell Symposium Steering Committee

### Journal Reviewer

2023 Science of Computer Programming

### Ph.D. Thesis Committee

2022 Nicolas Stucki, Scalable Metaprogramming in Scala 3, EPFL (advisor: Martin Odersky)

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## Invited Talks

### Efficient Compilation of Algebraic Effect Handlers.

April 2023 UC Berkeley Programming Systems Seminar

### MacoCaml: Staging Composable and Modular Macros

Oct 2022 McGill PL Seminar

### Language Theory into Practice, A Play in Three Acts

April 2022 Google Brain

April 2022 Cornell University

April 2022 University of Toronto

April 2022 Microsoft Research Redmond

Mar 2022 CMU

Mar 2022 University of Waterloo  
 Mar 2022 ETH Zurich  
 Mar 2022 University of Wisconsin-Madison  
 Feb 2022 EPFL  
 Feb 2022 Max Planck Institute for Software Systems  
 Feb 2022 Georgia Tech  
**Staging with Class: A Specification of Typed Template Haskell**  
 May 2022 YOW! Lambda Jam 2022.  
 Dec 2021 Programming Languages Seminar. EPFL.  
**Efficient Compilation of Algebraic Effect Handlers.**  
 Dec 2021 International Symposium on High Confidence Software. Peking University.  
 Oct 2021 8th International Workshop on Dependable and Secure Software Systems. ETH Zurich.  
**Perceus: Garbage Free Reference Counting with Reuse.**  
 Mar 2021 Laboratory for Foundations of Computer Science. The University of Edinburgh.  
**Type-based Language Design.**  
 Dec 2020 Programming Languages Seminar. Peking University.  
 Dec 2020 John Hopcroft Center for Computer Science. Shanghai Jiao Tong University.  
**Dependent Types in Haskell.**  
 Dec 2018 Hong Kong Functional Programming Meetup. Hong Kong.  
**Consistent Subtyping for All.**  
 May 2018 Penn PLClub. University of Pennsylvania. PA, US.

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## Teaching

Aug 2021 [Tutorial] Programming with Effect Handlers and FBIP in Koka @ ICFP 2021  
 Nov 2019 [Instructor] Haskell 101, *Google, New York City*  
 Spring 2019 [Teaching Assistant] Principles of Programming Languages, *University of Hong Kong*  
 Fall 2017 [Teaching Assistant] Functional Programming, *University of Hong Kong*

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## Mentoring

June 2022 [Panelist] Programming Language Mentoring Workshop (PLMW) @ PLDI 2022  
 Oct 2021- [Mentoring] SIGPLAN Long-Term Mentoring Program (SIGPLAN-M)  
 Jan 2021 [Mentoring] Programming Language Mentoring Workshop (PLMW) @ POPL 2021  
 Nov 2020 [Mentoring] Programming Language Mentoring Workshop (PLMW) @ SPLASH 2020  
 2020 [Mentoring] Xu Xue (PhD)  
 2020-2022 [Mentoring] Baber Rehman (PhD), Xuejing Huang (PhD)