Max S. New

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Curriculum Vitae

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Citizenship USA

Employment

◇ University of Michigan (Ann Arbor, MI, USA) *Aug. 2021* – Present
Assistant Professor
Computer Science & Engineering

◇ Wesleyan University (Middeltown, CT, USA) *Dec. 2020 – Aug. 2021*
Postdoctoral Researcher

Education

Northeastern University, Boston, MA *2014 – 2020*
PhD in Computer Science, *Dec, 2020*
Thesis: *A Semantic Foundation for Sound Gradual Typing*
Advisor: Amal Ahmed
Committee: Matthias Felleisen, Ronald Garcia, Daniel R. Licata, Peter Thiemann, Mitchell Wand

Northwestern University, Evanston, IL *2009 – 2014*
MS in Computer Science, *June 2014*
BA in Computer Science and Mathematics, *June 2013*

Research interests Programming language design, semantics and implementation; gradually typed programming languages; compiler intermediate languages; type theory; category theory

Funding AFOSR, Mechanized Denotational Semantics using Synthetic Category Theory, FA9550-23-1-0760, PI: Max S. New, $711,841 Sep 2023-Sep 2028

PhD Advisees

Eric Giovannini *Fall 2021-Present*, PhD Candidate, Metatheory of Gradually Typed Programming Languages.
Steven Schaefer *Summer 2023-Present*, PhD Candidate
Yuchen Jiang *Fall 2023-Present*, PhD Candidate
Eric Bond *Fall 2023-Present*, PhD Candidate
Yichen Tao *Fall 2023-Present*, PhD Candidate, Co-advised with Jean-Baptiste Jeannin
Jesse Slater *Fall 2024-Present*, PhD Candidate, Co-advised with Xinyu Wang

University Service

University of Michigan Hosting Committee *Fall 2022-Present*
Graduate Committee *Fall 2021-Winter 2022*

Professional Activies and Service

Program Co-chair with Guilhem Jabert *Fall 2024*
Twelfth Workshop on Higher Order Programming with Effects (HOPE 2024)

Co-organizer with Jean-Baptiste Jeannin, Cyrus Omar, Xinyu Wang *Fall 2023*
Midwest Programming Languages Symposium 2023

Program Co-chair with Daniel Hillerström *Fall 2023*
Eleventh Workshop on Higher Order Programming with Effects (HOPE 2023)

Program Co-chair with Jeremy Gibbons *April 2022*
Ninth Workshop on Mathematically Structured Functional Programming (MSFP 2022)

Program Co-chair with Sam Lindley *April 2020*
Eighth Workshop on Mathematically Structured Functional Programming (MSFP 2020)

Invited Participant
Shonan Meeting No. 146: Programming and Reasoning with Algebraic Effects and Effect Handlers *March 2019*
Dagstuhl Seminar 18201: Secure Compilation *May 2018*

Panelist NSF Proposal Reviewer, 2022

Panelist *January 2019*
Programming Languages Mentoring Workshop at POPL 2019
Panel: Grad School and Beyond

Co-chair with Gabriel Scherer *October 2016*
New England Programming Languages and Systems Symposium
(Selection Committee May 2016, June 2017, August 2018)

Program Committee Member (Conference)

- ACM SIGPLAN Conference Principles of Programming Languages (POPL) 2024
- ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA) 2023 (External Review / Artifact Evaluation Committee)
- 38th International Conference on Mathematical Foundations of Programming Semantics (MFPS) 2022
- ACM SIGPLAN International Conference on Functional Programming (ICFP) 2019

Program Committee Member (Workshop)

- Human Aspects of Types and Reasoning Assistants (HATRA) 2021
- Human Aspects of Types and Reasoning Assistants (HATRA) 2020

Journal Reviewing for: ACM Transactions on Programming Languages and Systems (TOPLAS), Journal of Functional Programming (JFP), Logical Methods in Computer Science (LMCS)

External Conference Reviewer POPL, ICFP, LICS, FoSSaCs, LNCS, TOPLAS, OOPSLA

Publications

Notions of Stack-Manipulating Computation as Relative Monads *OOPSLA 2025*
Yuchen Jiang, Runze Xue, Max S. New
Proceedings of the ACM on Programming Languages

Denotational Semantics of Gradual Typing using Synthetic Guarded Domain Theory *POPL 2025*
Eric Giovannini, Tingting Ding, Max S. New
Proceedings of the ACM on Programming Languages

Gradual Typing for Effect Handlers *OOPSLA 2023*
Max S. New, Eric Giovannini, Daniel R. Licata
Proceedings of the ACM on Programming Languages

A Formal Logic for Formal Category Theory *FoSSaCs 2023*
Max S. New, Daniel R. Licata
International Conference on Foundations of Software Science and Computation Structures

Gradual Type Theory *JFP Vol 31, 2021*
Max S. New, Daniel R. Licata
Journal of Functional Programming

Call-by-name Gradual Type Theory *LMCS Vol 16, Issue 1, 2020*
Max S. New, Daniel R. Licata
Logical Methods in Computer Science

Graduality and Parametricity: Together Again for the First Time *POPL 2020*
Max S. New, Dustin Jamner, Amal Ahmed
Proceedings of the ACM on Programming Languages

How to evaluate the performance of gradual type systems *JFP Vol 29, 2019*
Ben Greenman, Asumu Takikawa, Max S. New, Daniel Feltey, Robert Bruce Findler, Jan Vitek, Matthias Felleisen
Journal of Functional Programming

Gradual Type Theory *POPL 2019*
Max S. New, Daniel R. Licata, Amal Ahmed
Proceedings of the ACM on Programming Languages

Graduality from Embedding-projection Pairs *ICFP 2018*
Max S. New, Amal Ahmed
Proceedings of the ACM on Programming Languages

Call-by-name Gradual Type Theory *FSCD 2018*
Max S. New, Daniel R. Licata
International Conference on Formal Structures for Computation and Deduction

FabULous Interoperability for ML and a Linear Language *FoSSaCS 2018*
Gabriel Scherer, Max S. New, Nick Rioux and Amal Ahmed
International Conference on Foundations of Software Science and Computation Structures

Fair Enumeration Combinators *JFP Vol 27, 2017*
Max S. New, Burke Fetscher, Robert Bruce Findler, Jay McCarthy
Journal of Functional Programming

Fully Abstract Compilation via Universal Embedding *ICFP 2017*
Max S. New, William J. Bowman, and Amal Ahmed
Proceedings of the ACM on Programming Languages

Oh Lord, Please Don't Let Contracts be Misunderstood (Functional Pearl) *ICFP 2016*
Christos Dimoulas, Max S. New, Robert Bruce Findler, Matthias Felleisen
ACM SIGPLAN Conference on Object-oriented Programming, Systems, Languages, and Applications

A Coq Library For Internal Verification of Running-Times *FLOPS 2016*
Jay McCarthy, Burke Fetscher, Max New, Daniel Feltey, Robert Bruce Findler
International Symposium on Functional and Logic Programming

Is Sound Gradual Typing Dead? *POPL 2016*
Asumu Takikawa, Daniel Feltey, Ben Greenman, Max S. New, Jan Vitek, Matthias Felleisen
ACM SIGPLAN Symposium on Principles of Programming Languages

Workshop Talks

Relative Monads in Call-by-push-value as an Abstraction of Stack-Based Effects *HOPE 2022*
Max S. New
Higher-order Programming with Effects

From Call-by-push-value to Stack-based TAL? *LOLA 2019*
Max S. New
Syntax and Semantics of Low-Level Languages

Every Program in Your Redex Model, in Order *September 2013*
RacketCon 2013

Teaching

University of Michigan

- EECS 483, *Compiler Construction* *Fall 2021, Fall 2022, Fall 2023, Winter 2024*
  Upper-level undergraduate compilers course
- EECS 598, *Category Theory for Computer Scientists* *Winter 2022, Winter 2023*
  Graduate-level course on category theory and programming language semantics

Invited Talks

Compiling with Call-by-push-value *June 2023*
Mathematical Foundations of Program Semantics 2023

Gradual Typing for Effect Handlers *May 2023*
POPV Seminar, Boston University

A Type Theory for Formal Category Theory *March 2023*
Tallinn Institute of Technology

A Type theory for Formal Category Theory *October 2022*
LIX Proofs and Algorithms Seminar, École polytechnique

Type Theoretic Gradual Typing *June 2019*
PL Club, University of Pennsylvania

A Type Theoretic Approach to Gradual Typing *October 2018*
Principles of Programming Seminar, Carnegie Mellon University

Semantic Foundations for Gradual Typing *June 2018*
Mathematical Foundations of Program Semantics 2018

Call-by-name Gradual Type Theory *April 2018*
Northeastern PL Seminar

Retractions and Blame *December 2016*
Northeastern PL Seminar