

Paul Krogmeier

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<https://paulkrog.github.io>

EDUCATION

University of Illinois Urbana-Champaign

Ph.D. in Computer Science (advisor: Madhusudan Parthasarathy).

Ph.D. Thesis: Theory and Algorithms for Symbolic Learning.

Expected

Fall 2024

Purdue University

M.S. in Computer Engineering (advisor: Benjamin Delaware).

M.S. Thesis: A Core Calculus for Data Refinement.

B.S. in Computer Engineering (with highest distinction).

2016–2018

2012–2016

RESEARCH INTERESTS

My interests are in the foundations of **symbolic learning and reasoning**, with a focus on the problem of learning symbolic concepts that describe **structured data** like sequences, trees, graphs, or states of computer programs. This encompasses program synthesis from examples as well as learning classifiers expressed in logic. Recently, I have been exploring how to **synthesize domain-specific languages** to support efficient few-shot symbolic learning.

AWARDS

ACM SIGPLAN Distinguished Paper Award at OOPSLA

ACM SIGPLAN Distinguished Paper Award at POPL

Illinois Wing Kai Cheng Fellowship

Purdue Ross Fellowship

2023

2022

2018

2016

REFEREED CONFERENCE PUBLICATIONS

Paul Krogmeier and P. Madhusudan. 2023. Languages with Decidable Learning: A Meta-theorem. Proc. ACM Program. Lang. 7, OOPSLA1, Article 80 (April 2023), 29 pages. <https://doi.org/10.1145/3586032>

ACM SIGPLAN Distinguished Paper Award.

Paul Krogmeier*, Zhengyao Lin*, Adithya Murali*, and P. Madhusudan. 2022. Synthesizing axiomatizations using logic learning. Proc. ACM Program. Lang. 6, OOPSLA2, Article 185 (October 2022), 29 pages. <https://doi.org/10.1145/3563348>

Adithya Murali, Atharva Sehgal, Paul Krogmeier, P. Madhusudan. Composing Neural Learning and Symbolic Reasoning with an Application to Visual Discrimination. Proceedings of the Thirty-First International Joint Conference on Artificial Intelligence Main Track (IJCAI). Pages 3358-3365.
<https://doi.org/10.24963/ijcai.2022/466>

Paul Krogmeier and P. Madhusudan. 2022. Learning formulas in finite variable logics. Proc. ACM Program. Lang. 6, POPL, Article 10 (January 2022), 28 pages. <https://doi.org/10.1145/3498671>
ACM SIGPLAN Distinguished Paper Award.

Gilles Barthe, Rohit Chadha, Paul Krogmeier, A. Prasad Sistla, and Mahesh Viswanathan. 2021. Deciding accuracy of differential privacy schemes. Proc. ACM Program. Lang. 5, POPL, Article 8 (January 2021), 30 pages. <https://doi.org/10.1145/3434289>

Krogmeier, P., Mathur, U., Murali, A., Madhusudan, P., Viswanathan, M. (2020). Decidable Synthesis of Programs with Uninterpreted Functions. In: Lahiri, S., Wang, C. (eds) Computer Aided Verification. CAV 2020. Lecture Notes in Computer Science, vol 12225. Springer, Cham.
https://doi.org/10.1007/978-3-030-53291-8_32

Umang Mathur, Adithya Murali, Paul Krogmeier, P. Madhusudan, and Mahesh Viswanathan. 2019. Deciding memory safety for single-pass heap-manipulating programs. Proc. ACM Program. Lang. 4, POPL, Article 35 (January 2020), 29 pages. <https://doi.org/10.1145/3371103>

WORKSHOP PUBLICATIONS

Paul Krogmeier, Steven Kidd, Benjamin Delaware.
Towards Context-Aware Data Refinement. CoqPL 2018.

TEACHING

CS 421: Programming Languages and Compilers

University of Illinois
Fall 2019, Fall 2020,
Spring 2021 – Fall 2023,
Fall 2024

ECE 369: Discrete Mathematics for Computer Engineering

Purdue University
Fall 2017

INVITED TALKS

Learning Symbolic Concepts and Domain-specific Languages

MIT EECS, Apr 2024
Houston CS, Apr 2024
Purdue ECE/CS, Mar 2024

Languages with Decidable Learning: a Meta-theorem

Boston U. CS, Mar 2023

Learning Formulas in Finite-Variable Logics

St. Petersburg State University, Mar 2022