

# Paul Krogmeier

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<https://paulkrog.github.io>

## EDUCATION

### University of Illinois Urbana-Champaign

2018–Present

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

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

### Purdue University

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

2016–2018

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

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

2012–2016

## RESEARCH INTERESTS

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

## AWARDS

Distinguished Paper Award at OOPSLA

2023

Distinguished Paper Award at POPL

2022

Wing Kai Cheng Fellowship

2018

Ross Fellowship

2016

## REFEREED CONFERENCE PUBLICATIONS

Paul Krogmeier and P. Madhusudan.

Languages with Decidable Learning: a Meta-theorem.

**Distinguished paper**, OOPSLA 2023.

Paul Krogmeier\*, Zhengyao Lin\*, Adithya Murali\*, and P. Madhusudan.

Synthesizing Axiomatizations using Logic Learning.

OOPSLA 2022.

Adithya Murali, Atharva Sehgal, Paul Krogmeier, and P. Madhusudan.

Composing Neural Learning and Symbolic Reasoning with an Application to Visual Discrimination.

IJCAI 2022.

Paul Krogmeier and P. Madhusudan.  
Learning Formulas in Finite Variable Logics.  
**Distinguished paper**, POPL 2022.

Gilles Barthe, Rohit Chadha, Paul Krogmeier, Aravinda Sistla, Mahesh Viswanathan.  
Deciding Accuracy of Differential Privacy Schemes.  
POPL 2021.

Paul Krogmeier, P. Madhusudan, Umang Mathur, Adithya Murali, Mahesh Viswanathan.  
Decidable Synthesis of Programs with Uninterpreted Functions.  
CAV 2020.

Umang Mathur, Adithya Murali, Paul Krogmeier, P. Madhusudan, and Mahesh Viswanathan.  
Deciding Memory Safety for Single-pass Heap-manipulating Programs.  
POPL 2019.

## WORKSHOP PUBLICATIONS

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

## WORK IN PROGRESS

Paul Krogmeier and P. Madhusudan.  
Synthesizing DSLs for Few-Shot Learning.  
Algorithms for synthesizing domain-specific languages that can be learned efficiently from few examples.  
*In preparation.*

Paul Krogmeier.  
Computing with Abstractions.  
A new model of computation to study how abstractions emerge in an evolving computation.  
*In preparation.*

## INVITED TALKS

Languages with Decidable Learning: a Meta-theorem.  
Boston University, Mar 2023.

Learning Formulas in Finite-Variable Logics.  
Department of Software Engineering, St. Petersburg State University, Mar 2022.

## INVITED WORKSHOPS

**Dagstuhl seminar**  
Logic and Learning

Fall 2019

## TEACHING

CS 421: Programming Languages and Compilers

**University of Illinois**

Fall 2019, Fall 2020,  
Spring 2021, Fall 2021  
Spring 2022, Fall 2022,  
Spring 2023, Fall 2023

ECE 369: Discrete Mathematics for Computer Engineering

**Purdue University**

Fall 2017

## SERVICE

FMSD 2023 reviewer

ICALP 2023 external reviewer

LICS 2022 external reviewer

## STUDENT WORKSHOPS

VMCAI Formal Methods Winter School

New Orleans, LA  
Jan 2020

SRI Formal Methods Summer School

Atherton, CA  
May 2019

Oregon Programming Languages Summer School

Eugene, OR  
Jun 2017

## MISCELLANY

Native English speaker, fluent in Spanish, conversational in German.

Jazz alto saxophonist with substantial performance and teaching experience.

Lover of snow, mountains, and skiing.