

ANDREW BLINN

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me @ andrewblinn.com  github.com/disconcision  twitter.com/disconcision

VISION

I use programming language theory to explore, explain, and engineer compositional interfaces, trying to make engagement with algebraic abstractions more fluid, tangible, and fun

FOCUSES

Programming Languages + Liveness + Learning · Human-Computer Interaction

PAPERS

[Statically Contextualizing Large Language Models with Typed Holes](#) · OOPSLA · 2024

Andrew Blinn, Kevin Li, June Hyung Kim, Cyrus Omar

How to use holes & language servers to build global context for LLM code completions

[Total Type Error Localization and Recovery with Holes](#) · POPL · 2024

Eric Zhao, Raef Maroof, Anand Dukkupati, Andrew Blinn, Zoe Pan, Cyrus Omar

A formal account of static error localization & recovery as applied to editor semantic services


[Gradual Structure Editing with Obligations](#) · VLHCC · 2023

David Moon, Andrew Blinn, Cyrus Omar

Generalizing program holes to *syntactic obligations* allows more text-like structured editing

[An Integrative Human-Centered Architecture for Interactive Programming Assistants](#) · VLHCC · 2022

Andrew Blinn, David Moon, Eric Griffiths, Cyrus Omar

A syncretic account of programming assistants including a formalization of [suggestion](#)  [sensibility](#)

[Filling Typed Holes with Live GUIs](#) · PLDI · 2021

Cyrus Omar, David Moon, Andrew Blinn, Ian Voysey, Nick Collins, Ravi Chugh

Livelits embed persistent user-defined GUIs in code, enabling live inline graphical feedback

WORKSHOP PAPERS

[Toward a Live, Rich, Composable, and Collaborative Planetary Compute Engine](#) · PROPL · 2024

Alexander Bandukwala, Andrew Blinn, Cyrus Omar

A concept sketch for a graphical programming environment for climate science applications

[Tylr - A Tiny Tile-based Structure Editor](#) · TyDe · 2022

David Moon, Andrew Blinn, Cyrus Omar

Tylr combines traditional and structured editing approaches via a novel destructuring mechanism

SCHOOL

[University of Michigan](#) · Ph.D Candidate, Computer Science · Now

Contextualizing coding with types, interfaces, & language models with [Cyrus Omar @ FPLab](#)

[University of Michigan](#) · Master's of Science, Computer Science · 2023

Coursework in PL theory, program synthesis, category theory, HCI, & the psychology of learning

[University of Toronto](#) · H.B.Sc, Mathematics & Computer Science · 2019

Graduate coursework in abstract algebra, compilers, & graphics. Advised by [Gary Baumgartner](#)

INDUSTRY

[TODAQ Toronto](#) · Full-stack development in Clojure · 2019 - 2020

Built novel front-end interfaces to [sharpen the materiality of distributed digital assets](#).

Implemented core back-end features for a decentralized digital asset management protocol

SPEAKING ✈

- Accepted speaker at OOPSLA** · 2024 · Pasadena · [Recorded Talk](#) · [Slides](#)
Presented Statically Contextualizing Large Language Models with Typed Holes
- Invited speaker at RacketCon** · 2019 · Salt Lake City · [Recorded Talk](#) · [Slides](#)
Introduced [Fructure](#), a prototype structured interaction engine for edit-time term-rewriting
- Accepted speaker at Midwest PL Summit** · 2023 · Ann Arbor · [Slides](#)
Progress report on type-directed prompt construction for LLM-powered code completion
- Accepted speaker at VL/HCC** · 2022 · Rome · [Recorded Talk](#) · [Slides](#)
Presented an integrative human-centered architecture for interactive programming assistants
- Guest Lecturer** · 2023 & 2022 · Ann Arbor
Introduction to metaprogramming featuring Racket for [EECS 490 - Programming Languages](#)

CONFERENCES 📅

- Programming Committee Member** · Pasadena
2024: [Onward!](#) · [HATRA](#) · [LIVE](#)
- Student Volunteer** · Chicago
2021: [SPLASH/OOPSLA](#)
- Seat Filler** · LA, Rome, Chicago, Salt Lake City, Galiano, Toronto, Eugene, St.Louis, Empire Builder
2024: [Ink & Switch Unconf](#), [OOPSLA](#), [LIVE](#), [HATRA](#), [Gradient Retreat](#)
2023: [MWPLS](#), [Local First Unconf](#), [Fission TrainJam](#), [Strange Loop](#), [Gradient Retreat](#), [Causal Islands](#)
2020 - 2022: [VL/HCC](#), [Gradient Retreat](#), [SPLASH/OOPSLA](#), [HATRA](#), [LIVE](#)
2018 - 2019: [Racket Summer School](#), [Clojure North](#), [OPLSS](#), [ICFP](#), [Strange Loop](#), [RacketCon](#)

TEACHING 📖

- Course Development** · 2022 - Now · University of Michigan
Wrote assignments and software infrastructure for [EECS 490 - Programming Languages](#)
Implemented Hazel Exercises, an educational editor integration providing progressive live feedback
- Course Development** · Summer 2018 · University of Toronto
Designed course materials for [CSC 324 - Principles of Programming Languages](#) including an [algebraic stepper](#) illustrating non-determinism, and a [little language](#) demonstrating pattern matching
- Teaching Assistantship** · 2018 - Now · Universities of Michigan & Toronto
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|--------------------------------|------------------------|--|
| 2023, 2022, 2021 | University of Michigan | EECS 490 - Programming Languages |
| 2019, 2018 ² , 2017 | University of Toronto | CSC 324 - Principles of Programming Languages |
| 2018 | University of Toronto | CSC 104 - Introduction to Computational Thinking |

MENTORSHIP 💬

- June (Jacob) Kim**: LLM type-directed Hole-filing in TypeScript · 2024 - Now
Extracting semantic information from the TypeScript language server to inform prompt construction
- Xiang (Kevin) Li**: Type-constrained LLM Code Completion via token masking · 2023 - 2024
Researching modifying local language model decoding to ensure semantic as well as syntactic invariants
- Zachary Eichenberger & Eric Fan**: Deep reinforcement learning for code completion · 2021 - 2023
Applications of typed structured editing for RL-based completion. Co-mentorship with [Ethan Brooks](#)
- Yash Gaitonde**: Interfaces for live feedback in teaching IDEs · 2021 - 2022
Implementing live test feedback in the Hazel IDE, deployed to a class of 100 undergraduates

PROJECTS 📁

- IDE Design, Implementation, Deployment, and Analytics with Cyrus Omar** · 2020 - Now
Led a [ground-up rewrite](#) of the [Hazel IDE](#), deployed to 100 undergraduates
- Investigations in Dynamic, Interactive Algebraic User Interfaces** · 2022 - Now
Exploring tangibility and explorability in expository math and meta-math with [nool](#) and [furl](#)
- Variability-aware Data Structures with Marsha Chechik & Ramy Shanin** · 2018 - 2019 · [Slides](#)
Research in [variational analysis of SPLs](#) including building [SpyShare](#), a Haskell tool using Graphviz to visualize structure sharing, and designing + formally modelling rewrite-rule based optimizations
- Independent Study in Structured Editing in Racket with Gary Baumgartner** · Summer 2017
Self-directed studies in languages tooling resulting in [Fructure](#) and [Containment Patterns](#)