

Yekai Pan

pyk@seas.upenn.edu

EDUCATION

University of Pennsylvania

Ph.D. in Computer and Information Science

Philadelphia, PA

Fall 2026 – Spring 2031

University of Rochester

B.S. in Computer Science, B.A. in Philosophy; GPA: 3.89

Rochester, NY

Fall 2022 – Fall 2025

TECHNICAL SKILLS

Areas: Neurosymbolic AI, Formal Verification, Static Analysis, Compiler Optimization

Languages: C/C++, Rust, Python, Lean, Coq, Java, x86 Assembly

Frameworks & Tools: MLIR, LLVM, PyTorch, vLLM, Docker, Linux

WORK EXPERIENCE

Research Engineer

Rabdos AI

Feb 2026 - Present

Philadelphia, PA

- Building and optimizing production pipeline for math problem generations
- Generating and verifying Lean proofs of math theorems
- Driving end-to-end product delivery

Machine Vision Engineer Intern

9Realms

Dec 2023 – Jan 2024

Shenzhen, China

- Developed image classification models for house type categorization using PyTorch and MMPretrain, achieving production-ready accuracy
- Conducted systematic hyperparameter optimization and delivered technical report benchmarking model performance across vision tasks

Data Engineer Intern

9Realms

Jul 2022 – Aug 2022

Shenzhen, China

- Trained and deployed roof damage classification models on Google Vertex AI, managing full ML lifecycle from data curation to cloud deployment

Vision SLAM Engineer Intern

Institute of Automation, Chinese Academy of Sciences

Jun 2021 – Jul 2021

Beijing, China

- Implemented feature extraction and matching pipelines for visual SLAM systems, contributing to localization and mapping research

RESEARCH EXPERIENCE

AI for Math with Lean

Visiting Research Assistant, Advisor: Prof. Mayur Naik

Jan 2025 – Present

University of Pennsylvania

- Developing neurosymbolic techniques for automated theorem proving and mathematical reasoning in the Lean proof assistant

Symbolic Polynomial Locality Analysis

Research Assistant, Advisor: Prof. Chen Ding

May 2023 – Jan 2026

University of Rochester

- Designed and implemented static analysis algorithms in Rust for deriving symbolic reuse intervals in affine LLVM MLIR programs
- Developed symbolic Denning recursion using Barvinok's method for counting integer points in polytopes, enabling fully symbolic cache miss analysis
- Proved optimal locality guarantees for matrix multiplication kernels with non-square loop tiling transformations
- Evaluated framework accuracy against ML kernels and PolyBench benchmark programs
- Two papers planning for submission to OOPSLA 2026

Graph Theory

Research Assistant, Advisor: Prof. Daniel Stefankovic

Jul 2024 – Dec 2025

University of Rochester

- Proved impossibility results showing diameter-2 graph 3-coloring cannot be solved by examining subsets of vertices
- Developed polynomial-time algorithms for 3-coloring specific families of diameter-2 graphs
- Applied spectral methods and convex optimization to recover multiple planted cliques in random graphs in polynomial time for $P(n, k, \frac{1}{2})$ where $k > cn^{1/4}$

PUBLICATIONS

Yifan Zhu, **Yekai Pan**, Chen Ding, and Yanghui Wu. “Fully Symbolic Analysis of Loop Locality: Using Imaginary Reuse to Infer Real Performance.” 2026. arXiv:2603.10196

“Deriving Symbolic AET using Cache Identity Equation.” To be presented at *HIPS 2026*.

Yifan Zhu, **Yekai Pan**, and Chen Ding. “Sawtooth Wavefront Reordering Enhanced CuTile FlashAttention on NVIDIA GB10.” To be presented at *GPGPU 2026*, 2026. arXiv:2601.16032

Terence Kelly and **Yekai Pan**. “Catch-23: The New C Standard Sets the World on Fire.” *ACM Queue*, 2023. doi:10.1145/3588242

PROJECTS

Reussir

github.com/reussir-lang/reussir

Maintainer

2025 – Present

- A programming language with Rust-like syntax and region-based memory management, built on LLVM/MLIR, Rust, and Haskell

TEACHING

Teaching Assistant, CSC 282: Design & Analysis of Algorithms

Fall 2023, Fall 2024

University of Rochester

Rochester, NY

Teaching Assistant, CSC 252: Computer Organization

Spring 2023, Spring 2024

University of Rochester

Rochester, NY