Minsung Cho

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Education

Northeastern University, Ph.D. Computer Science 2022–Present

Advisor: Steven Holtzen

Carnegie Mellon University, B.S. Mathematics and Philosophy (Logic track) 2018–2022

Thesis: *Cops and Robbers in Lean*
Advisor: Jeremy Avigad

Experience

PhD Student Researcher, Northeastern University 2022-Present

- Working in the intersection of probabilistic program semantics and knowledge compilation

NSF REU Researcher, University of Tennessee at Chattanooga 2021

- Classified an extension of certain quasi-differential operators on a Hilbert space
- Published in *Opuscula Mathematica*

Researcher in Combinatorics, Carnegie Mellon University 2020

- Generalized the cop-win property to 1-connected infinite graphs
- Research featured on 2021 CMU Mathematics newsletter
- Grant proposal featured by CMU Undergraduate Research for exceptional writing

Publications

The Krein-von Neumann extension of a regular even order quasi-differential operator. M. Cho, S. Hoisington, B. Udall, R. Nichols. Opuscula Mathematica. 41.6 (2021): 805-841.[1]

Invited Talks

Scaling Decision–Theoretic Probabilistic Programming Through Factorization DRAGSTERS @ PLDI 2023

PLDI Student Research Competition 2023 First Place.

Projects

`dappl`: **Optimization-via-compilation In Discrete Probabilistic Programs** Rust, OCaml

Designing a functional programming language to reason about Bayesian decision making under uncertainty, utilizing a branch-and-bound style algorithm to scalably solve maximum expected utility problems.

The Evolution of Proof Assistants Jupyter Notebook, Typescript

Mined the GitHub data of Lean 3, Coq, and Isabelle and their respective math libraries to provide actionable insights on best development organizational practices for theorem proving communities.

[1] In math, author order is alphabetical. All authors contributed equally.

Cops and Robbers in Lean Lean 3

Formalized the game of Cops and Robbers on a graph and associated theorems such as *a complete graph is always cop-win* and *every cop-win graph has a corner*.

Awards

PLMW@PLDI 2023 scholarship recipient.

OPLSS 2022 scholarship recipient.

University and College honors from Carnegie Mellon.

Skills

Fluent in Korean and English.

Experience in functional programming (Lean, Haskell, OCaml, Standard ML), Python, Rust, LaTeX.

Comfortable with Unix, Git.

Five semesters of TA experience in mathematics and logic, including one graduate course, at CMU.