Minsung Cho

minsung@ccs.neu.edu | khoury.northeastern.edu/home/minsung/

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

NSF REU Researcher, University of Tennessee at Chattanooga 2021

- Classified the Krein–von Neumann extension on regular even–order quasi–differential operators
- Published in *Opuscula Mathematica* (impact score 1.30)

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 highlighted by CMU Undergrad Research staff

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.

Projects

Decision–Theoretic Probabilistic Programming Rust

Using a novel branch-and-bound algorithm to solve the maximum expected utility problem on a BDD, we introduce a new probabilistic programming language that allows for sound decision–theoretic reasoning.

A Formally Verified BDD Package Lean 4

We implement a BDD package in Lean 4, and use its bottom-up SAT solving capabilities to design new variable ordering heuristics to speed up compilation of known UNSAT problems.

Cops and Robbers in Lean Lean 3

We formalize 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*.

Skills

Fluent in Korean and English.

Experience in functional programming (Lean, Coq, Haskell, ML dialects), Python, Rust.

5 semesters of teaching experience in mathematics and logic, including one graduate course.