

Soheun Yi

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Education

B.S. in Mathematics at Seoul National University, GPA: 4.21/4.3. 03.2017–Present

- Major GPA: 4.23/4.3
- Fall 2019–Spring 2021: On leave for mandatory military service.

Seoul Science High School, GPA: 4.29/4.3. 03.2014–02.2017

- A specialized high school for gifted students in mathematics and science.
- Graduated with Excellence Awards.

Research Interests

- Optimization theory** and its applications including **causality**.
- Causal discovery**, including linear structural equation models and time series.

Publications

(* for equal contribution.)

- [1] Jongmin Lee*, **Soheun Yi***, and Ernest K. Ryu. "Convergence Analyses of Davis–Yin Splitting via Scaled Relative Graphs". In: *arXiv preprint* (2022). Submitted to *Mathematical Programming*. arXiv: 2207.04015.
- [2] **Soheun Yi** and Ernest K. Ryu. "Convergence Analyses of Davis–Yin Splitting via Scaled Relative Graphs II: Convex Optimization Problems". In: *arXiv preprint* (2022). arXiv: 2211.15604.

Experience

Research

Research Intern, Graduate School of Data Science, Seoul National Univ., 03.2022–Present

Advisor: Sanghack Lee.

Topic: Causal discovery in cyclic linear structural equation models.

- Developed a new method for causal discovery from observational data based on continuous optimization.
- Theoretically verified recovery of the sparsest causal structure when exogenous variables are Gaussian.
- Also works well with non-Gaussian exogenous variables.

Research Intern, Dept. of Mathematical Sciences, Seoul National Univ., 01.2022–Present

Advisor: Ernest K. Ryu.

Topic: Convergence analyses of the three operator splitting (TOS).

- Analyzed the convergence of the TOS with scaled relative graphs [1, 2].
- Improved tight convergence rates of the fixed point iteration with the TOS.
- Improved tight convergence rates of the TOS-based optimization algorithm.

Employment

Quantitative Analyst, *Hyperithm*, Seoul. 08.2019–08.2021

- Served as an alternative for **mandatory military service**.
- Developed and implemented quantitative trading strategies.
- Maintained transaction review systems.
- Programming experiences:
 - Transaction log parsing (RegEx, BigQuery),
 - Processing and visualizing market data (Pandas),
 - Options pricing and trading simulation (NumPy, SciPy).

Teaching

Teaching Assistant, *Mathematical and Numerical Optimization*. Fall 2022

Deputy Leader, *Team Korea at Romanian Master of Mathematics*. 02.2019

Teaching Assistant, *Korea Mathematics Olympiad Winter School*. 01.2018

Voluntary Teaching for Low-income Children. 03.2014–06.2019

Awards and Honors

Simon Marais Mathematics Competiton, *Pair Merit Prize*. 10.2020

Undergraduate Scholarship from Korea Foundation for Advanced Studies, *3k/year*. 03.2019–Present

Dean's List, *Dept. of Mathematical Sciences*, Seoul National University. 2017–2022

Korea Undergraduates Mathematics Competition, *Field 1 Gold Prize*. 12.2018

Presidential Science Scholarship from Korea Student Aid Foundation, *Full enrollment fee + 4k/year*. 03.2017–Present

Korea Final Candidates for International Mathematical Olympiad (IMO). 03.2016

- Top 13 participants in Korea.

Romanian Master of Mathematics, *Silver Medal*. 02.2016

Selected Graduate Courses

- Scalable High Performance Computing
 - Implemented the fastest CUDA program among 100 participants in [the term project](#).
- Data Science and Reinforcement Learning
 - Implemented a modified bootstrapped DQN agent. Resulted top 10% in [the term project](#).

Extracurricular

SNU Vocal and Hip-hop Club "Triple-H". 03.2019–11.2020

Vocal of Band "Limsup". 03.2017–11.2018