

# Soheun Yi

E-mail: [lsdluis1@gmail.com](mailto:lsdluis1@gmail.com)  
Homepage: [lsdluis1.github.io](https://lsdluis1.github.io)

## 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