Soheun Yi

E-mail: lsdluis1@gmail.com
Homepage: 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 exprinces:
    - 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. ⬀
- Recent Advances of Applied Statistics: Causal Inference.
    - Proposed a data-driven prognostic score estimation. ⬀

Extracurricular

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

Vocal of Band "Limsup".   **03.2017–11.2018**