Soheun Yi

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Education

Carnegie Mellon University, *PhD, Statistics.*   **09.2023–Present**
Seoul National University, *BS, Mathematical Sciences.*   **03.2017–08.2023**
- *Summa Cum Laude*, GPA: 4.19/4.3.
- Fall 2019–Spring 2021: On leave for mandatory military service.

Research Interests

- **High-dimensional statistics** and **theoretical machine learning**.
- **Optimization theory** and its application in **causal discovery**.

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). 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.,   **03.2022–08.2023**
Advisor: Sanghack Lee.
Topic: Causal discovery on linear cyclic Gaussian graphical models.
- Developed a new method for causal discovery on linear cyclic Gaussian models from observational data.
- Reached the state-of-the-art performance in terms of the BIC score.

Research Intern, *Dept. of Mathematical Sciences*, Seoul National Univ.,   **01.2022–12.2022**
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 expriences:
  - Transaction log parsing (`RegEx`, `BigQuery`),
  - Processing and visualizing market data (`Pandas`),
  - Options pricing and trading simulation (`NumPy`, `SciPy`).

Teaching

Teaching Assistant, *Modern Regression (36-401)*.   **Fall 2023**

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**

- Top $4/150 = 3\%$ of participants.

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.