Hanseul Cho (조한슬)

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Personal Profile

I am a Master's student in the Optimization & Machine Learning (OptiML) Laboratory, advised by Prof. Chulhee Yun at Kim Jaechul Graduate School of Artificial Intelligence (GSAI) in Korea Advanced Institute of Science and Technology (KAIST). Before this, I received my Bachelor's degree in Mathematical Sciences (major) and Computing Sciences (minor) at KAIST in 2022.

My primary research interests lie in optimization, machine learning, and deep learning, mainly focusing on theoretical analysis of them. Recently, I have been looking at nested optimization for stochastic/finite-sum settings—including minimax optimization (*i.e.*, saddle point problem), bi-level optimization, actor-critic algorithms, fair machine learning, etc.—with particular interest.

Education

Korea Advanced Institute of Science and Technology (KAIST) — *Seoul, Republic of Korea*

M.Sc. in Artificial Intelligence — *Mar. 2022 - Current*

- Advisor: Prof. Chulhee Yun (Optimization & Machine Learning (**OptiML**) Laboratoy, Kim Jaechul Graduate School of AI (GSAI), KAIST)

Korea Advanced Institute of Science and Technology (KAIST) — *Daejeon, Republic of Korea*

B.Sc. in Mathematical Sciences — *Mar. 2017 - Feb. 2022*

- Minor in Computer Sciences
- Summa Cum Laude (GPA: 4.05/4.3)

University of Twente — *Enschede, Netherlands*

Exchange Student Program — *Feb. 2020 – Jul. 2020*

- Major in Applied Mathematics

Incheon Science High School — *Incheon, Republic of Korea*

High School — *Mar. 2015 – Feb. 2017*

- Early Graduation

Publication

PREPRINTS

- **Hanseul Cho** and Chulhee Yun. SGDA with shuffling: faster convergence for nonconvex-PŁ minimax optimization. 2022. *arXiv:2210.05995*. (Preprint Under Review.)

DOMESTIC CONFERENCES/JOURNALS

- **Hanseul Cho** and Chulhee Yun. SGDA with shuffling: faster convergence for nonconvex-PŁ minimax optimization. Short version in *2022 KAIA-NAVER Autumnal Joint Conference*. 2022.
  - **NAVER Best Theory Paper Award & Oral presentation.**

Experiences

Machine/Deep Learning Theory + Physics (MDLTP) Seminar — *Seoul, Republic of Korea*

Organizer — *Jul. 2022 – Current*

- Homepage: sites.google.com/view/mdlt-p
- Jointly organized by OSI, OptiML, and CSSPL
- Topics: Learning theory, loss landscape, trajectory analysis, (stochastic) optimization, high-dimensional statistics, statistical/mathematical physics, scientific machine learning, and more.

KAIST 2021 Post-AI Research Project — *Daejeon, Republic of Korea*

Undergraduate Researcher — *May 2021 – Dec. 2021*

- Jointly advised by Prof. Sangyoon Yi (SOIL Lab, GSFS, KAIST) & Prof. Jinkyoo Park (Sys. Int. Lab, ISysE, KAIST)
- Project: Research on 'AI-augmented Organizations' of Collaborative Decision Making and Learning
- Contribution: Devised a model-based randomized algorithm for single-player finite-horizon NK landscape optimization game

Korea Advanced Institute of Science and Technology (KAIST) *Daejeon, Republic of Korea*

Individual Study *Mar. 2021 – Jun. 2021*

- Advised by Prof. Jinwoo Shin (ALIN Lab, GSAI, KAIST)
- Study: (1) gradient-based optimizers for large-batch setting (*e.g.*, LARS & LAMB); (2) theoretical analysis on gradient clipping

Korea Advanced Institute of Science and Technology (KAIST) *Daejeon, Republic of Korea*

Individual Study *Sep. 2020 – Feb. 2021*

- Advised by Prof. Jong-chul Ye (BISPL, BBE, KAIST)
- Assignment: Semantic Segmentation of Kidney Tumor with U-Net (with KiTS19 Challenge Dataset)

Korea Advanced Institute of Science and Technology (KAIST) *Daejeon, Republic of Korea*

Individual Study *Jun. 2020 – Aug. 2021*

- Advised by Prof. Yeonseung Chung (MAS, KAIST)
- Study: Statistical Learning Theory

Awards

2022	**NAVER Best Theory Paper Award**, 2022 KAIA-NAVER Autumnal Joint Conference	*Republic of Korea*
2022	**Summa Cum Laude**, Bachelor's, KAIST	*Republic of Korea*
2017 – 2020	**The National Scholarship for Science and Engineering**, Korea Student Aid Foundation	*Republic of Korea*
2017 Fall	**Dean's List**, The School of Freshman, KAIST	*Republic of Korea*

Skills

Programming Familiar: Python (PyTorch, NumPy, Scikit-learn, Jupyter, Pandas, etc.), MATLAB. Novice: C, C++, R, HTML/CSS, Scalar

Miscellaneous Familiar: LaTeX (Overleaf/VSCode), Git, Microsoft Office. Novice: Adobe (Lightroom, Premiere Pro, After Effects, Photoshop).

Languages

English Sufficient for academic activities: TOEIC score 925 (LC 460, RC 465) (2021.04.11)

Korean Native proficiency

Others Had some introductory courses on French, German, Classical Latin, & Chinese.