

JAEWOOK LEE

Curriculum Vitae

Personal Information

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Education

(PROSPECTIVE)	Stanford University Ph.D. in Electrical Engineering	Paloalto, CA, United States
FEB 2025	Korea Advanced Institute of Science and Technology M.S. in Artificial Intelligence (Advisor: Prof. Chulhee Yun) GPA: 4.25/4.3	Seoul, South Korea
FEB 2023	Korea Advanced Institute of Science and Technology B.S. in Electrical Engineering & Mathematical Sciences (<i>Double Major</i>) GPA: 4.07/4.3, SUMMA CUM LAUDE <i>Graduated with Excellence in Leadership and Volunteer Activity</i>	Daejeon, South Korea
FEB 2018	Sejong Science High School	Seoul, South Korea

Research Interests

I am interested in **optimization theory**, including both classical convex/nonconvex/stochastic optimization and applications to practical problem settings in AI/ML. This includes optimization & sampling algorithms, deep learning theory, fairness (as constrained optimization), and the optimization dynamics of transformers. Recently, I have been particularly interested in **Wasserstein gradient flows** and applications to deep learning theory.

I specialize in **minimax optimization** and similar topics like monotone operator theory and variational inequalities. I am currently working on the convergence analysis of accelerated first-order minimax optimization algorithms. I am also interested in broader topics like multi-player games and multi-agent learning as well. I also currently have ongoing research on **block coordinate descent**, which could also be thought of as a purely cooperative n -player game.

Publications

- [1] Donghwa Kim, **Jaewook Lee**, Chulhee Yun. Provable Benefit of Random Permutations over Uniform Sampling in Stochastic Coordinate Descent. *To be uploaded*.
- [2] **Jaewook Lee**^{*}, Hanseul Cho^{*}, Chulhee Yun. Fundamental Benefit of Alternating Updates in Minimax Optimization. *Proceedings of the 41st International Conference on Machine Learning (ICML)*, 2024. **Spotlight**.
- [3] Jaeyoung Cha, **Jaewook Lee**, Chulhee Yun. Tighter Lower Bounds for Shuffling SGD: Random Permutations and Beyond. *Proceedings of the 40th International Conference on Machine Learning (ICML)*, 2023. **Oral**.

^{*}Equal Contribution.

Experiences

Optimization & Machine Learning and Intelligence Lab (OptiML Lab) Research Intern (Advisor: Prof. Chulhee Yun, KAIST AI)	JUN 2022 – FEB 2023
<ul style="list-style-type: none">Worst-case convergence lower bounds of gradient-based optimization algorithms	
Machine Learning & Intelligence Lab (MLILAB) Research Intern (Advisor: Prof. Eunho Yang, KAIST AI)	JUL 2021 – MAR 2022
<ul style="list-style-type: none">Implemented talking head video generation based on GANs, 3D morphable face models, and neural renderersParticipated in the MLILAB weekly group paper study (<i>Reading & implementing one paper per week</i>)	

Projects

National Institute of Environmental Research (NIER)
Government Research Project

AUG 2022 – CURRENT

- Real-time ozone concentration prediction (Time-series prediction using real chemical & meteorological data)

Talks

- AUG 22ND, 2024 **2024 Digital Innovators' Symposium**, Seoul, South Korea ([page](#))
Title: Fundamental Benefit of Alternating Updates in Minimax Optimization
- AUG 13TH, 2024 **SNU-KAIST AI/ML Theory Workshop**, Gangneung, South Korea ([page](#))
Title: Exploiting Coordinate Structures in Optimization Algorithms

Awards & Honors

- 2024 ICML, **Spotlight Paper**
- 2023 ICML, **Oral Presentation**
- FALL 2021 **Simon Marais Mathematics Competition**, Top Quartile (Rank 16/132)
Asia-Pacific undergraduate math contest ([Pair with DeukHyeon Kwon](#))
- FALL 2021 KAIST MAS, **PoW (Math Problem of the Week)** - 3rd Prize
Math problem-solving competition for the Fall semester
- SPRING 2021 KAIST EE, **Dean's List Award**
Awarded to the top 3% of all EE students
- FALL 2020 KAIST EE, **Academic Excellence Scholarship**
Awarded to the top 4 students in EE
- FALL 2020 KAIST EE, **Dean's List Award**
- FALL 2019 KAIST EE, **Dean's List Award**
- FALL 2018 KAIST, **Freshman Dean's List Award**
Awarded to the top 3% of all freshman students

Professional Services

Journal/Conference Reviewer. JMLR 2024, NeurIPS 2024, ICLR 2025, ICML 2025
ℒ_{TEX} Template Engineer. Was officially in charge of the KAIST ℒ_{TEX} thesis template (2024)

Teaching Experience

KAIST Freshman Tutoring Program. Calculus II (2020 Fall, 2022 Spring)
General Physics I (2019 Spring)

Skills

Languages. English (*Highly Proficient*), Korean (*Native*)
TOEFL 115/120 (R29/L30/S29/W27), TOEIC 985/990

Computer Languages. Python (PyTorch Libraries), MATLAB, Julia, ℒ_{TEX}

Extracurricular Activities

- 2025 **Project Starlight Orchestra** First Violinist
- 2023 **Merry Orchestra, Original** First Violinist
- 2018-2022 **KAIST Orchestra** First Violinist (2019 Concertmaster)
- 2020-2022 **KAIST CGC (Communication Globalization Committee)**, English Translator
- 2018-2021 **KAIST EDGE (Table Tennis Club)** Member
- 2020-2021 **KAIST UA (Undergrad. Assoc.)** Bureau of Welfare & Bureau of International Affairs
- 2020-2021 **KAIST FEEL (EE Conference Camp, [link](#))** Program Director
- 2021 **KAIST 50th Anniversary Conference “Pioneers: 2071”**
Program Director (Scenario Author & Assistant MC)
- 2018-2019 **KAIST FSC (Freshman Student Council)**