Jaewook Lee

Personal Information

Address	Kim Jaechul Graduate School of AI,	Phone	+82-10-3539-1857
	Korea Advanced Institute of Science and Technology,	Email	99rma37 (at) kaist.ac.kr
	85 Hoegi-ro, Dongdaemun-gu, Seoul, South Korea	Website	id8198.github.io

Education

Current	Korea Advanced Institute of Science and Technology M.S. in Artificial Intelligence GPA: 4.25 / 4.3 (*Current*)	Seoul, South Korea
Feb 2023	Korea Advanced Institute of Science and Technology B.S. in Electrical Engineering & Mathematical Sciences (*Double Major*) GPA: 4.07 / 4.3, Summa Cum Laude *Graduated with* **Excellence in Leadership and Volunteer Activity**	Daejeon, South Korea
Feb 2018	Sejong Science High School	Seoul, South Korea

Research Interests

- **Mathematical Optimization Theory**
  - Convex, Nonconvex, Stochastic Optimization & Control Theory
  - Minimax Optimization & Fixed Point / Monotone Inclusion Problems
  - (Block) Coordinate Descent Algorithms
  - Wasserstein Gradient Flows & Algorithms
- **Optimization for ML/DL**
  - Implicit Bias & Dynamics of Deep Learning Optimizers
  - Generalization Bounds of Learning Algorithms
  - Applications of Wasserstein Gradient Flows to Deep Learning Theory

Publications

[1] **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.***

[2] 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), KAIST GSAI Jun 2022 – Feb 2023
Advisor: Prof. Chulhee Yun (KAIST GSAI)

- Worst-case convergence lower bounds of gradient-based optimization algorithms

Machine Learning & Intelligence Lab (MLILAB), KAIST GSAI Jul 2021 – Mar 2022
Advisor: Prof. Eunho Yang (KAIST GSAI)

- Video generation models based on 3D morphable face models and neural renderers
- Participated in the MLILAB weekly group paper study (*Reading & implementing one paper per week*)

Awards & Honors

Fall 2021	KAIST MAS, **PoW (Math Problem of the Week)** - 3rd Prize
Spring 2021	KAIST EE, **Dean's List Award**
	(Awarded to top 2% students among all students in EE)
Fall 2020	KAIST, **Honor Student**
	(Awarded to juniors with high GPA, allows taking graduate courses)
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 top 2% students among freshmen)

Talks

Aug 22ND, 2024	*2024 Digital Innovators' Symposium*, Seoul, South Korea
	Title: Fundamental Benefit of Alternating Updates in Minimax Optimization
Aug 13RD, 2024	*SNU-KAIST AI/ML Theory Workshop*, Gangneung, South Korea
	Title: Exploiting Coordinate Structures in Optimization Algorithms

Professional Services

Reviewer. JMLR 2024, NeurIPS 2024, ICLR 2024

Teaching Experience

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

Skills

Languages. English (*Highly Proficient, TOEIC 985/990*), Korean (*Native*)
Computer Languages. Python (PyTorch Libraries), MATLAB, LaTeX

Extracurricular Activities

2023	**Merry Orchestra Original** First Violinist
2018-2022	**KAIST Orchestra** First Violinist
2019	**KAIST Orchestra** Concertmaster
2020-2022	**KAIST CGC** (*Communication Globalization Committee*), English Translator
2018-2021	**KAIST EDGE** (*Table Tennis Club*) Member
2021	**KAIST UA** Executive Secretariat
2019-2020	**KAIST FEEL** (*EE Conference Camp*) Program Director
2020	**KAIST 50th Anniversary Conference "Pioneers: 2071"**
	Program Director, Scenario Author & Assistant MC
2020	**KAIST UA** Bureau of Welfare & Bureau of International Affairs
2018-2019	**KAIST FSC** (*Freshman Student Council*)