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KIHYUN YU

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RESEARCH INTERESTS

My research focuses on **safe reinforcement learning (RL) theory**. In particular, I design algorithms for **constrained MDPs** with provable guarantees under various settings, such as adversarial, linear, and average-reward formulations. I am also broadly interested in sequential decision-making, including bandit algorithms, online convex optimization, and their real-world applications.

EDUCATION

- KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST) — South Korea
  - Integrated M.S.–Ph.D. Program in Industrial and Systems Engineering — 03/2024 – present
  - Advisor: Prof. Dabeen Lee
  - GPA: 4.2 / 4.3
- GWANGJU INSTITUTE OF SCIENCE AND TECHNOLOGY (GIST) — South Korea
  - B.S. in Electrical Engineering and Computer Science — 03/2018 – 02/2024
  - Minor in Mathematics
  - GPA: 4.08 / 4.5 (*cum laude*)
  - Two-year leave for mandatory military service (2020 – 2021)
- SEJONG SCIENCE HIGH SCHOOL — South Korea
  03/2015 – 02/2018

PUBLICATIONS

PREPRINTS

[1] **Kihyun Yu**, Beomhan Baek, Dabeen Lee. Learning Weakly Communicating Average-Reward CMDPs: Strong Duality and Improved Regret. Available at: https://arxiv.org/abs/2605.11586

[2] **Kihyun Yu**, Seoungbin Bae, Dabeen Lee. Near-Optimal Primal-Dual Algorithm for Learning Linear Mixture CMDPs with Adversarial Rewards. Available at: https://arxiv.org/abs/2603.27884

PUBLICATIONS

[3] **Kihyun Yu**, Seoungbin Bae, Dabeen Lee. Primal-Dual Policy Optimization for Linear CMDPs with Adversarial Losses. *International Conference on Learning Representations (ICLR)*, 2026. Available at: https://arxiv.org/abs/2605.11535

[4] Jiahui Zhu, **Kihyun Yu**, Dabeen Lee, Xin Liu, Honghao Wei. An Optimistic Algorithm for online CMDPs with Anytime Adversarial Constraints. *International Conference on Machine Learning (ICML), 2025.* Available at: https://arxiv.org/abs/2505.21841

[5] **Kihyun Yu**, Duksang Lee, William Overman, and Dabeen Lee. Improved Regret Bound for Safe Reinforcement Learning via Tighter Cost Pessimism and Reward Optimism. *Reinforcement Learning Conference (RLC), 2025.* Available at: https://rlj.cs.umass.edu/2025/papers/Paper41.html

Academic Services

- Conference Reviewer: ICML 2026, NeurIPS 2026, IEEE CDC 2026

Teaching Experience

- Teaching Assistant, Operations Research: Optimization (KAIST) $03/2024 - 06/2024$
- Teaching Assistant, Differential Equations (GIST) $09/2023 - 12/2023$
- Teaching Assistant, Single Variable Calculus (GIST) $03/2023 - 06/2023$

Honors

- Scholarship for Academic Excellence
  - Awarded for 6 semesters (Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2022, Spring 2023)

Experience

- Information Processing, Controlling, and Network Lab (GIST) South Korea
  - Undergraduate Research Intern (Advisor: Prof. Heung-No Lee) $01/2023 - 12/2023$
  - Conducted research on lattice-based cryptography
- Artificial Intelligence Lab (GIST) South Korea
  - Undergraduate Research Intern (Advisor: Prof. Kyoobin Lee) $07/2022 - 12/2022$
  - Conducted research on robust image classification under noisy labels
- University of Cambridge United Kingdom
  - Summer Session Programme (Machine Learning) $07/2019 - 08/2019$

Languages and Technical Skills

- Korean (native), English (conversational)
- C/C++, Python, PyTorch, LaTeX

Other Activities

- Volunteer Math Mentor $03/2018 - 12/2018$
  - Provided small-group math mentoring for middle and high school students