Harin Lee

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Academic Interests

Reinforcement Learning Theory, Bandits, Game Theory, Algorithms

Education

Seoul National University, Seoul, Korea — Mar 2018–Feb 2025 (expected)
Bachelor of Science (expected)
Double Major in Computer Science and Engineering and Mathematical Sciences
GPA : Overall 4.18/4.3, CSE 4.2/4.3, Math 4.3/4.3, 1st in department
Leave of Absence for Military Service: Sep 2020–Aug 2022

Seoul Science High School, Seoul, Korea — Mar 2015–Feb 2018

Publications

[1] **H. Lee**, T. Hwang, and M.-h. Oh, "Lasso bandit with compatibility condition on optimal arm", *International Conference on Learning Representations*, 2025, (To appear).

[2] **H. Lee** and M.-h. Oh, "Minimax optimal reinforcement learning with quasi-optimism", *International Conference on Learning Representations*, 2025, (To appear).

[3] **H. Lee** and M.-h. Oh, "Improved regret of linear ensemble sampling", *Advances in Neural Information Processing Systems*, vol. 37, pp. 92 803–92 831, 2025.

Research Experience

Graduate School of Data Science, Seoul National University — April 2023–Present
Undergraduate Researcher
Advisor : Prof. Min-hwan Oh

- Analyzed `FS-WLasso` for sparse linear contextual bandits and derived its $O(\text{poly}\log dT)$ regret bounds
  - Utilized simple algorithm : Forced-sampling then greedy selections
  - Employed mildest assumption : Margin condition and compatibility condition on optimal arms only
  - Demonstrated superior empirical performance
- Improved regret analysis of linear ensemble sampling
  - Achieved frequentist regret bound of $\tilde{O}(d^{3/2}\sqrt{T})$ for the first time with ensemble size of $\tilde{O}(K)$
- Devised `EQO` for tabular reinforcement learning
  - Designed simple algorithm : `UCBVI`-style with bonus term of $c/N(s,a)$ without empirical variance
  - Relaxed conventional assumptions : Imposed boundedness only on value function
  - Achieved minimax regret bound with tightest logarithmic factor and non-leading term
  - Demonstrated superior empirical performance

Thunder Research Group, Dept. of CSE, Seoul National University — Jul 2022–Dec 2022
Undergraduate Research Opportunity Program, Creative Integrated Design 1
Advisor : Prof. Jaejin Lee

- Developed low-precision and quantization methods for GPT-2

Honors and Awards

Paper Awards

K-Data Science Conference Nov 2024
- President of National Research Foundation of Korea Award (Top 2 among 28 finalists) [1]

Korean Artificial Intelligence Association Summer Conference Aug 2024
- Excellence Paper Award (Top 7) [1]

Scholarships

Merit-Based Scholarship Spring 2024
Seoul National University
- Full tuition

Kwanjeong Domestic Scholarship Mar 2020–Feb 2024
Kwanjeong Educational Foundation
- Full tuition and additional scholarship for four semesters

Eminence Scholarship Fall 2019
Seoul National University
- Full tuition

SNU Development Fund Scholarship Spring 2019
Seoul National University Foundation

Merit-Based Scholarship Fall 2018
Seoul National University

Programming Competitions

Silver Medal (7th Place) & Asia Pacific Champion The 47th ICPC World Finals Apr 2024
- Most prestigious global competition for undergraduate students
- Represented Seoul National University as part of a three-member team

4th Place Seoul National University Programming Contest Division 1 Sep 2023

4th Prize Samsung Collegiate Programming Cup Sep 2023

Silver Prize (3rd Place) The 2022 ICPC Asia Seoul Regional Contest Nov 2022

2nd Place The 2022 ICPC Asia Korea National First Round Programming Contest Oct 2022

4th Place Seoul National University Programming Contest Division 1 Sep 2022

3rd Prize Samsung Collegiate Programming Cup Sep 2022

Skills

Programming Languages: **C, C++, Python**

Machine Learning Frameworks: **PyTorch, TensorFlow**

Languages: **Korean** (native), **English** (fluent)

Extracurricular Activities

Meari SNU Central Rock Band June 2018–July 2020
- Synthesist(Keyboardist), leader of the synthesizer part in year 2019

Danfung SNU College of Engineering Rock Band Sep 2018–Aug 2019
- Drummer