

Hyoyeon Lee

Interests

Machine Learning, Decision-Making, Optimization, Data Engineering, Causal Inference

Education

- 2018–2021 **M.S. in Statistics**, Korea University, Seoul, South Korea
GPA: 4.0/4.5 (Official GPA: 94.3/100), Advisor: Prof. SangBum Choi

Publications

- [1] **H.Y. Lee, T.H. Ko**, *Cross-Attention Temporal Fusion for Robust and Trustworthy Multimodal Learning*, AISTATS, Under Review, 2026
- [2] **H.Y. Yi**, *Optimizing DRAM Chip Treatment Selection by Enhanced Robust RL with Decision Regime in Progressive Decision-making Data*, IEEM, Accepted, 2025

Honors and Awards

- 2025 **President & CEO Award**, Samsung Electronics, All Departments
 - Selected as one of only **three project teams selected company-wide among 100,000+ employees** for the most outstanding technical achievement of the year.
 - Recognized for establishing a core DRAM optimization technology and achieving record-high manufacturing yields through ML-driven automation.
- 2024 **Best Paper Award**, Samsung Electronics, Memory Business
 - Honored with the Best Paper Award at the Memory Business internal technical conference for research excellence in “Optimizing DRAM Chip Selection via Robust RL”.
- 2023 **DREAM Fair Top10**, Samsung Electronics, Memory Business
 - Selected as **Top 10 among 1,000+ participants** across all new BS/MS/PhD graduate engineers.
 - Recognized for building 7 automated DRAM analysis tools and a TB-scale data engineering framework, leading to enterprise-wide deployment.
- 2023 **Best Seminar Award**, Samsung Electronics, DRAM Product Engineering Team
 - Recognized for contributions to technical training as an instructor (2022-24) for 'ML for Semiconductor Analysis' (See Teaching Experience).
- 2023 **Development Best Performer**, Samsung Electronics, DRAM Product Engineering Team
 - Recognized by the DRAM Product Engineering Team for developing 7 automation tools that reduced DRAM data preprocessing time by 90%.
- 2017 **Model Leadership Award**, 4th University Leadership Academy, National Assembly of Korea
 - Selected as a Model Leader during the '4th University Leadership Academy'.
- 2016 **Best Team Award**, 3rd University Leadership Academy, National Assembly of Korea
 - Earned for outstanding team project performance during the '3rd University Leadership Academy'.

Patents and Proposals

- 2025 **Patent (Under Examination)**, *Automated BLSA Optimization Frameworks*, Samsung Electronics
- 2025 **Patent (Under Examination)**, *Sensing Optimization via Chip-level MMT Application using ML*, Samsung Electronics

Presentations

Conference and Seminar Talks

- [1] **H.Y Yi**, *IEEE International Conference on Industrial Engineering and Engineering Management*, Optimizing DRAM Chip Treatment Selection by Enhanced Robust RL with Decision Regime in Progressive Decision-making Data, Melbourne, Australia, Dec 2025
- [2] **H.Y Yi**, *Samsung Product Engineering Technology Conference*, Optimizing DRAM Chip selection by Enhanced Robust Reinforcement Learning with Decision Regime, Hwasung, South Korea Nov 2024

Work Experience

- 2024–Present **Machine Learning Optimization Engineer**, *Samsung Electronics*, South Korea
- Deployed ML optimization frameworks across DRAM product lines (Server, HBM, Mobile), achieving record-high yield improvements.
 - Engineered Bit Line Sense Amplifier optimization processes using Python-based automation modules and C/C++ server-side logic.
 - Integrated advanced ensemble algorithms to improve model performance.
 - Constructed automated dashboards and modular analysis tools to streamline production decision-making.
 - Established edge-computing based ML automation platform for real-time optimization across multi-device testing environments.
 - Set up 20+ next-generation DRAM mass-production programs, achieving the highest yields to date.
- 2022–2023 **Data Analytics Engineer**, *Samsung Electronics*, South Korea
- Developed and automated 7 reusable preprocessing frameworks, reducing average DRAM data handling time by 90%.
 - Architected a distributed big-data pipeline using Dask, PyArrow, AWS Glue for TB-scale failure logs.
 - Deployed an end-to-end anomaly detection system using Airflow, Glue triggers and reporting workflows.
 - Collaborated with process/device experts to connect analytical findings with root cause investigations, accelerating yield improvement.

Research Experience

- 2022–Present **Researcher**, *Samsung Electronics*, South Korea
- Conducted advanced causal inference research using double machine learning techniques to optimize semiconductor manufacturing.
 - Designed hybrid ML algorithms for automated process parameter tuning in DRAM fabrication.
 - Explored robust reinforcement learning methods for progressive decision-making data to enhance DRAM treatment strategies.
 - Authored and submitted three internal research papers to Samsung Electronics technical journals:
 - Selective Interaction-Aware Causal Inference via DML for Semiconductor Process Optimization
 - Hybrid Machine Learning Algorithms for Automated Semiconductor Process Optimization
 - Optimizing DRAM Chip Treatment Selection by Enhanced Robust Reinforcement Learning
- 2019–2021 **Statistics Consultant**, *Korea University Statistics Consulting Center*, Seoul, South Korea
- Analyzed chronic kidney disease progression using survival models on clinical time-series data.
 - Identified early dementia biomarkers via structural equation modeling and cluster analysis.
 - Evaluated impact of teaching methods through factor analysis and regression in child education study.
- 2018–2019 **Research Assistant**, *National Statistical Research Center*, Seoul, South Korea
- Performed Bayesian change-point survival analysis to evaluate vaccine effectiveness and durability.
 - Developed statistical learning methodologies for personalized medical treatment recommendations.
 - Conducted semi-parametric survival analysis for dependent censoring and dynamic treatment regimes.
- 2017 **Research Intern**, *POSTECH, Interdisciplinary Bioinformatics Lab*, Pohang, South Korea
- Participated in a project studying innate immunity activation by plant R proteins.
 - Executed bioinformatics-based data analysis by incorporating protein sequence analysis tools, including Geneious and BLAST.

Teaching Experience

- 2022–2024 **Seminar Instructor, Machine Learning for Semiconductor Analysis**, Samsung Memory Division
- Led bi-weekly ML seminars with full code repositories for semiconductor analytics.
 - Facilitated hands-on workshops and mentored junior researchers.
 - Honored with the 'Best Seminar Award' in recognition of the program's direct contribution and linkage to business performance.
- 2019 **Teaching Assistant, Multivariate Analysis**, Korea University, Dept. of Statistics
- Graded assignments and exams for 40+ undergraduate students.
 - Hosted weekly office hours to assist students with course concepts and statistical software R.

Professional Examinations

Actuarial Examinations

SOA **Exam P, Probability –Passed**

Skills

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|-------------|--|
| Programming | Python, SQL, R, Linux, L ^A T _E X |
| Back-end | Java, Python, C/C++ |
| Front-end | JavaScript, React, Vite, Tailwind, Zustand, Routing |
| Languages | Korean (Native), English (Fluent) |
| Cloud | AWS, GCP |

Selected Online Coursework

Verified Certificates

- 2025 **Machine Learning Specialization**, DeepLearning.AI (Andrew Ng)
- 2025 **Machine Learning for Trading Specialization**, Google Cloud & New York Institute of Finance

Extracurricular Activities

- 2024–Present **Education Volunteer & Mentor**, Dongtan Church, South Korea
- Led weekly Christian prayer services and served as a faith education mentor.
 - Planned and led youth retreats; organized and conducted mission trips to under-resourced rural churches during vacations.
- 2025 **Culture Agent, Intelligence Data Science Lab**, Samsung Electronics, Suwon, South Korea
- Spearheaded cultural initiatives as a leader in a 50-member cross-functional team, organizing monthly team-building events.
 - Promoted open communication and inclusive engagement across teams to foster a strong team culture.
 - Managed social budgets and event resources, strengthening team morale and cohesion.
- 2018–2020 **Medical Volunteer**, Korea University Anam Hospital, Seoul, South Korea
- Served at the International Healthcare Center, providing interpretation for international patients and assisting with clinical documentation.
- 2013–2020 **Member**, Seoul Intercollegiate Tennis Club (TC), Seoul, South Korea
- Trained weekly as part of an intercollegiate tennis team.
 - Competed in regional intercollegiate tournaments.