

# Hyoyeon Lee

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## 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 bio informatics-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

Programming Python, SQL, R, Linux,  $\text{\LaTeX}$   
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.