Hyoyeon Lee

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Interests

Machine Learning, *Optimization*, Data Engineering, Quantitative Research Engineering

Education

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

Work Experience

2024–Present **Machine Learning Optimization Engineer**, *Samsung Electronics*, South Korea

- Applied ML optimization frameworks to DRAM product lines (EDP, HBM, Mobile), achieving record-high yield improvements.
- Developed Bit Line Sense Amplifier optimization processes using Python-based automation modules and C/C++ server-side logic.
- Integrated advanced ensemble algorithms for efficient model performance.
- Built automated dashboard setup 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.
- Supported 20+ next-generation DRAM mass production programs, achieving highest-ever yields.

2022–2023 **Data Analytics Engineer**, *Samsung Electronics*, South Korea

- Built and deployed 7 reusable automation tools for repetitive DRAM data preprocessing, cutting average processing time by 90%.
- Developed a parallel big data processing framework using Dask, PyArrow, and AWS Glue to handle TB-scale failure test logs.
- Implemented a fully automated anomaly detection system for yield/performance data with Airflow/Glue triggers and reporting pipelines.
- Collaborated with process/device experts to connect analytical findings with root cause investigations, accelerating yield improvement.

Research Experience

2022–2025 **Researcher**, *Samsung Electronics*, South Korea

- Conducted advanced causal inference research using double machine learning techniques to optimize semiconductor manufacturing.
- Developed hybrid ML algorithms for automated process parameter tuning in DRAM fabrication.
- Investigated 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 Bio Informatics Lab*, Pohang, South Korea
- Participated in a project studying innate immunity activation by plant R proteins.
- Conducted bio informatics-based data analysis by incorporating protein sequence analysis tools, including Genius and BLAST.

Publications

[1] **H.Y Yi**, *Optimizing DRAM Chip Treatment Selection by Enhanced Robust RL with Decision Regime in Progressive Decision-making Data*, IEEM, Accepted, 2025

Presentations

[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

Honors and Awards

2025 **President & CEO Award**, *Samsung Electronics*, All Departments
2024 **Best Paper Award**, *Samsung Electronics*, Memory Business
2023 **DREAM Fair Top10**, *Samsung Electronics*, Memory Business
2023 **Best Seminar Award**, *Samsung Electronics*, DRAM Product Engineering Team
2023 **Development Best Performer**, *Samsung Electronics*, DRAM Product Engineering Team
2017 **Model Leadership Award**, *4th University Leadership Academy*, National Assembly of Korea
2016 **Best Team Award**, *3rd University Leadership Academy*, National Assembly of Korea

Patents and Proposals

2025 **Patent**, *Automated BLSA Optimization Frameworks*, Samsung Electronics
2025 **Patent**, *Sensing Optimization via Chip-level MMT Application using ML*, Samsung Electronics
2024 **2 High-Grade Proposals**, *Advanced Optimization Algorithms*, Samsung Electronics

Teaching Experience

2022–2024 **Seminar Instructor**, *Machine Learning for Semiconductor Analysis*, Samsung Memory Division
2019 **Teaching Assistant**, *Multivariate Analysis*, Korea University, Dept. of Statistics

Skills

Programming Languages: Python, AWS, C/C++, SQL, R, Linux, Latex
Korean (Native), English (Fluent)

Extracurricular Activities

2025–Present **Volunteer Mentor**, *Middle and High School Students*, Dongtan Church, South Korea

2025–Present **Culture Agent, Intelligence Data Science Lab**, *Samsung Electronics*, Suwon, South Korea
- Acted as a culture leader in a 50-member cross-functional team, organizing monthly team-building events and collaborative activities.
- Promoted open communication and inclusive engagement across teams to foster a strong team culture.
- Managed social budgets and event resources, improving 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