# JIN HYEONG KIM

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## Education

Mar 2024 - Present **M.S. in Electrical Engineering**
KAIST (Korea Advanced Institute of Science and Technology)
Focus: *AI for Science, Optimization, Organic Light-Emitting Diodes*
Advisor: *Prof. Seunghyup Yoo* — Total GPA of 3.95/4.3 (96.50/100)

Mar 2018 - Feb 2024 **B.S. in Material Science and Engineering**
KAIST (Korea Advanced Institute of Science and Technology)
Total GPA of 3.69/4.3 (93.90/100)

## Research Experience

**Graduate Research Assistant** **IOEL (Integrated Organic Electronics Lab), EE, KAIST**

Optimization of Complex Systems

Apr 2025 - Present **Failure-Aware Bayesian Optimization for OLED-MLA Design**
Built Bayesian optimization framework for high-dimensional, design-constrained OLED engineering problem to achieve high normal directionality for AR/VR application
Designed a transformer-based failure-screening filter
Developed an failure-aware algorithm encompassing warm-start and k-NN-based regression
Achieved +28% current efficiency compared to hemispherical micro-lens arrays (MLAs)

Jun 2024 - Mar 2025 **Multi-objective Optimization Tool for Light Outcoupling Enhancement in OLEDs**
Designed multi-objective optimization algorithm for enhancing light emission characteristics in a free-form MLA + OLED system based on genetic algorithm using Pareto solutions and penalty function approach
Achieved 63% EQE (near +3% enhancement compared to hemispherical MLAs)
Presented in KMiD 2025 (Korean Meeting on Information Display)

ML Works *co-advised by Prof. Insu Han, EE, KAIST*

Nov 2025 - Present **Data-Curated, Sparsely-Activated MoE for Spline Failure Prediction**
Aims to achieve 'Transformer-based MoE Classifier' with higher accuracy and data-efficiency
Applies RL-based preference optimization to curate datasets that maximize informativeness
Develop sparsely activated MoE to enhance computational efficiency

Aug 2025 - Oct 2025 **Transformer-based MoE Classifier for Simulation Gating**
Developed a transformer-based Mixture-of-Experts(MoE) model to predict spline generation failure in LightTools (supporting 'Failure-Aware Bayesian Optimization for OLED-MLA Design)
Achieved predictive accuracy of 98.5% via feature engineering, expert specialization through train set sampling, gating, and discrete/joint training pipelines
Achieved 63% reduction in total errors and 22% improvement in F1 score

Phototherapeutic Device Engineering *funded by LG Electronics*

Jan 2025 - Present **Photon-Transport Simulation for Phototherapeutic Device Diffusion Layer**
Built Monte-Carlo-based photon tracing simulation model leveraging hollow nanoparticles as scatterers for enhanced light diffusion, grounded in Mie theory and Bohren-Huffman formalism
Fabricated wearable phototherapeutic devices consisting of LED arrays and scattering layer

Sep 2023 - Mar 2025 **Clinical Effect of Blue-suppressed Light Source**
Fabricated blue-suppressed light device and designed protocol for clinical studies to observe hormonal changes and the effect on stress and sleep quality

## Work Experience

Mar 2021 - Sep 2022 **Mandatory Military Service**

Jan 2021 - Feb 2021 **Intern, NAND QE1 Team, SK Hynix**
Research project on 'HTDR Pre EW Fast Cycle Time Reduction and Evaluation'

## Scholarship

Mar 2021 - Oct 2025 **SK Hynix Scholarship** 9500$ / year

## Teaching

Sep 2025 - Feb 2026 **Counseling Assistant, Dept. of Electrical Engineering**

Sep 2025 - Dec 2025 **Teaching Assistant, Advanced Digital System Design (EE.40005)**

Mar 2025 - Jun 2025 **Teaching Assistant, Semiconductor Devices (EE362)**

Sep 2024 - Dec 2024 **Teaching Assistant, Introduction to Electronics Design Lab (EE302)**

## Extracurricular

Mar 2025 - Aug 2025 **International Student Recruitment Committee, School of EE, KAIST**
Coordinated and served as an instructor in *KAIST EE Camp 2025* for 70+ international students from 13 countries and assisted in the recruitment process

Mar 2023 - Feb 2024 **Mentor, Samsung Dreamclass, Samsung Welfare Foundation**
Mentored 10 underprivileged middle school students to support career exploration

Mar 2019 - Feb 2021 **Vice President, Dept. of MSE Student Council, KAIST**
Organized 10+ department events participated by professors, graduates and undergraduates
Contributed in organizing untact department affairs during COVID-19

## Technical Skills

Programming and ML Tools (MATLAB, Python (PyTorch, scikit-learn))

Optic Simulations (LightTools, Lumerical, MATLAB)

Device Fabrication (Atomic Layer Deposition, Thermal Evaporation, Reactive Ion Etching)

Device Characterization (Atomic Force Microscopy, OLED Characterization)

## Languages

English (fluent, TOEFL iBT: 110), Korean (native)