Juhee Han

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I am a curious, self-innovating student with a passion for continuous learning and exploring new ideas. My research interests include deep learning, machine learning, trusted AI, AI agent, natural language processing (NLP), feature extraction, and their applications in various domains such as medical imaging and mass spectrometry.

EDUCATION

SKKU (Sungkyunkwan University) — Suwon, Republic of Korea
B.S. in Electrical Engineering — Mar. 2023 - Feb. 2026

- GPA: 4.22/4.5

University of British Columbia (UBC) — British Columbia, Canada
B.S. in Electrical and Computer Engineering — Jan. 2025 - Aug. 2025

- GPA: 4.0/4.0 (all A+)

RESEARCH EXPERIENCES

Undergraduate Research Assistant — Apr.2025 - Present
Trusted and Efficient AI (TEA) lab, UBC

· Masked Language Modeling for Mass Spectrum Analysis with Hierarchical Token Merging

Undergraduate Research Assistant — Dec.2024 - Present
SmartBioMed Lab, SKKU

· Glaucoma Detection Combining Anatomical and Deep Features

Undergraduate Research Assistant — Dec.2023 - Nov.2024
Visual and Scientific Computing (VSC) Lab, SKKU

· Implemented a neural network to transform 2D sketches into high-quality 3D object models
· Designed a method to reconstruct high-quality 3D models from low-resolution multi-view images using video super-resolution models

PROJECTS

Introduction to Robotics — Jan.2025 - Apr.2025
iRobot Mapping and Navigation

· Engineered an autonomous robot to navigate and map unknown, low-granularity environments by implementing and integrating brush fire mapping and Dijkstra's shortest path algorithms
· Developed a simulation environment to visualize a point-based search algorithm, generating time-ordered snapshots to validate the robot's exploration and mapping strategy prior to hardware deployment
· Integrated a LiDAR sensor on board for real-time obstacle classification, allowing the robot to differentiate between large structural objects and small movable items

Deep Learning — Jan.2025 - Apr.2025
Conditional PixelCNN++ for Image Classification

· Implemented the Conditional PixelCNN++ model to generate new images and classify the given images
· Optimize the negative log-likelihood of pixel values conditioned on preceding pixels and class embeddings using a cross-entropy loss function
· Combined PixelCNN with FiLM-based modulation and heterogeneous fusion approaches to inject class information throughout the model

Embedded System Design Sep.2024 - Dec.2024
Development of SKKUman

- Designed a humanoid robot capable of executing pick-and-place tasks using Jetson Nano
- Implemented YOLO-based object detection for real-time recognition of objects and destinations
- Integrated servo motors and FSM for precise arm control and task execution

Microprocessor Laboratory Sep.2024 - Dec.2024
Elevator Control System Design

- Developed a real-time elevator control system on the RA6M3 board using e^2 studio
- Incorporate DC motor control for floor movement and servo motor control for door operations
- Implemented CAN communication for real-time monitoring and a 7-segment display for floor indication
- Designed an interrupt-driven input system for floor selection and efficient priority handling

PUBLICATIONS

Juhee Han, Soo Min Oh, Hee Jo, Bengie L. Ortiz, Yifan Li, and Jo Woon Chong, "Hybrid Anatomical and Deep Feature Fusion for Automated Glaucoma Detection", **Under Review**

Juhee Han, Soo Min Oh, Hee Jo, Bengie L. Ortiz, Yifan Li, and Jo Woon Chong, "Optimized SVM-based Glaucoma Classification Using Swin Transformer Features", **Under Review**

Ko, Hyun-kyu, Park, Dongheok, Park, Youngin, Lee, Byeonghyeon, **Han, Juhee**, and Park, Eunbyung, "Sequence Matters: Harnessing Video Models in Super-Resolution," The Association for the Advancement of Artificial Intelligence (AAAI), 2025.

COURSES

UBC: Introduction to Robotics (ELEC442), Deep Learning (CPEN455), Control System (ELEC441)
SKKU: Computer Architecture Theory, Introduction to Machine Learning, Signals and Systems, Probability and Random Processes, Engineering Mathematics I/II, Logic Circuits, Logic Design Lab, Electromagnetism I/II, Circuit Theory I/II

TECHNICAL SKILLS

Languages	: Python, MATLAB, Verilog, Assembly, C, LaTeX
Machine Learning Tools	: Pytorch, Scikit Learn, Pandas, Numpy, HuggingFace, Langchain
Developer Tools	: Vim, VS Code, Visual Studio, Jupyter Notebook, Git
Operating Systems	: Ubuntu, Windows, Android, iOS

AWARDS AND SERVICE

Academic Scholarship Mar. 2025
WE-UP Smart Car System Design Competition 2nd Place Aug. 2024
6th SKKU Autonomous Driving Hackathon 3rd Place Nov. 2023
Tutoring for Students with Disabilities Feb. 2023 – Jun. 2024

- Provided academic support in Engineering Mathematics I/II, Logic Design Laboratory, and Introduction to Automatic Control.

LANGUAGES

English (TOEFL 99/120), Korean (Native)