Juhee Han

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https://jhee-han.github.io

RESEARCH INTEREST

- **AI for Healthcare**
- **Natural Language Processing(NLP)**
- **Computer Vision**
- **Deep Learning**

EDUCATION

Sungkyunkwan University (SKKU) Suwon, Republic of Korea
B.S. in Electrical Engineering Mar. 2023 - Expected 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 EXPERIENCE

Research Assistant Dec. 2024 – Present
SmartBioMed Lab, Sungkyunkwan University, Advisor: Prof. Jowoon Chong

· Developed a **Glaucoma detection framework** combining anatomical features with multi-backbone features
· Trained models using **Machine Learning classifiers** such as XGBoost, achieving over 96% cross-validation accuracy

Research Assistant Apr. 2025 – Aug. 2025
Trusted and Efficient AI (TEA) Lab, University of British Columbia, Advisor: Prof. Xiaoxiao Li

· Designing a co-occurrence-aware tokenization strategy for **Masked Language Modeling** of MS/MS spectra to improve peptide identification efficience.
· Engineered a **multimodal retrieval-agmented generation (RAG)** pipeline with integrated Vision-Language Models (VLM) for a chemical agent intelligence assistant using **LangChain**.

Research Assistant Dec. 2023 – Nov. 2024
V-Lab, Yonsei University, Advisor: Prof. Eunbyung Park

· Evaluated **3D reconstruction** methods, including NeRF and 3D Gaussian Splatting, on self-captured datasets, identifying limitations in rendering refraction and reflection effects.
· Designed and implemented a **Sketch-to-3D** pipeline integrating ControlNet++ for sketch-to-image translation, DRCT/IPG super-resolution for image enhancement, and InstantMesh for mesh generation.

PUBLICATIONS

Juhee Han, Soo Min Oh, Hee Jo, Bengie L. Ortiz, Yifan Li, Junghoon Kim 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, "Automated Glaucoma Classification in Fundus Images Using Multi-Backbone Feature Fusion", The 25th IEEE International Conference on BioInformatics and BioEngineering (BIBE 2025).

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.

SELECTED 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

SELECTED PROJECTS

Introduction to Robotics Jan. 2025 – Apr. 2025
iRobot Mapping and Navigation, Advisor: Prof. Tim Salcudean

- Engineered an autonomous iRobot using **Python on a Raspberry Pi** to navigate and map unknown low-resolution environments using brushfire mapping and Dijkstra's shortest path algorithms.
- Integrated an onboard **LiDAR** sensor for real-time obstacle classification.

Deep Learning Jan. 2025 – Apr. 2025
Conditional PixelCNN++ for Image Classification, Advisor: Prof.Renjie Liao

- Implemented a **class-conditional PixelCNN++ in PyTorch** for joint image generation and classification, achieving 88.03% test accuracy and a Fréchet Inception Distance (FID) of 28.95.
- Designed a loss function combining **Discretized logistic mixture likelihood** for generation with cross-entropy for classification, optimizing pixel-level prediction and label accuracy.
- Integrated **FiLM (Feature-wise Linear Modulation)** based modulation and early, mid, and late fusion strategies to inject class information throughout the network, improving conditional generation fidelity.

Embedded System Design Sep. 2024 – Dec. 2024
Development of SKKUman, Advisor: Prof. Jo Woon Chong

- Designed a humanoid robot capable of executing pick-and-place tasks using **NVIDIA Jetson Nano**.
- Implemented **YOLO**-based object detection for real-time recognition of objects and destinations.
- Integrated servo motors with a finite state machine (FSM) for precise arm control and task sequencing.

Microprocessor Laboratory Sep. 2024 – Dec. 2024
Elevator Control System Design, Advisor: Prof. Jae Wook Jeon

- Developed a real-time elevator control system on the **Renesas RA6M3 board using e^2 Studio**.
- Designed **CAN**-based communication for real-time monitoring and a 7-segment display for floor indication.

TECHNICAL SKILLS

Languages	: Python, MATLAB, Verilog, Assembly, C, C++, LaTeX
Machine Learning Tools	: Pytorch, Scikit Learn, Pandas, Numpy, HuggingFace, Langchain, Blender
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
Tutoring for Students with Disabilities	Feb. 2023 – Jun. 2024
6th SKKU Autonomous Driving Hackathon 3rd Place	Nov. 2023

LANGUAGES

English : TOEFL 99/120, OPIC : AL
Korean : Native

EXTENDED COURSEWORK INFORMATION

Introduction to Robotics Jan. 2025 – Apr. 2025
University of British Columbia, Advisor: Prof. Tim Salcudean

- Textbook: "Robotics, Vision and Control" by Peter Corke
- Core topics: Kinematics, Dynamics, Control, Path planning and navigation, Introduction to computer vision

Deep Learning Jan. 2025 – Apr. 2025
University of British Columbia, Advisor: Prof. Renjie Liao

- Textbook: "Deep Learning" by Ian Goodfellow , "Probabilistic Machine Learning: An Introduction" by Kevin Murphy
- Core topics: Neural Networks (MLP, CNN, RNN), Regularization, Optimization, Transformers & LLMs, Generative Models, Reinforcement Learning

Fundamentals of Visual Computing Jan. 2025 – Apr. 2025
University of British Columbia, Advisor: Prof. Xiaoxiao Li

- Textbook: "The Elements of Statistical Learning" by Friedman, Hastie
- Core topics : Vision foundation models, vision-language modeling, generative approaches, and prompt tuning

Introduction to Machine Learning Sep. 2023 – Dec. 2023
Yonsei University, Advisor: Prof. Eunbyung Park

- Textbook: "Pattern recognition and machine learning" by Christopher Bishop
- Core topics: Linear Regression, MLE and MAP, Perceptron, Logistic Regression, Gaussian Discriminative Analysis, Naive Bayes, Support Vector machines, Neural Networks, Decision Trees, Clustering, Mixture of Gaussian, Dimensionality Reduction