

Junhee Kim

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EDUCATION

Inha University

M.S. in Statistic & Data Science (*GPA: 4.44/4.50 now*)
Bayesian Statistics Lab. (*Advisor: Seongil Jo*)

Feb. 2025 – Feb. 2027
(expected)

Inha University

B.S. in Statistics (*GPA: 4.14/4.50*)
Interdisciplinary Major in Samsung Convergence Software Course

Mar. 2019 – Jul. 2023

RELATED COURSEWORKS

M.S. Coursework

Regression Analysis, Machine Learning, Bayesian Statistics, Statistical Quality Control, Deep Neural Networks, Mathematical Statistics

B.S. Coursework

Bayesian Statistics, Regression Analysis, Probability Statistics, Statistical Software, Data Structures, Spatio Temporal Analysis, Graph Thoery, Computer Network, Database

PROJECTS

2025 INHA AI Challenge | Language Information-based Image Colorization

Jul. 2025

- Implemented a generative AI model to add natural colors to grayscale images based on text descriptions.
- Applied and fine-tuned an LCAD (Language-guided Colorization) diffusion model to maximize performance.

LG Aimers 6th Offline Hackathon

Apr. 2025

- Developed a model to predict pregnancy success probability for infertility patients.
- Designed a Stacking Ensemble model (CatBoost, LightGBM) to optimize for a complex evaluation metric.
- Engineered domain-specific features from clinical data to improve model performance and interpretability.

Contrastive Learning-based Driving Pattern Analysis

Feb. 2024

- Proposed a novel self-supervised learning methodology for unlabeled smartphone sensor data.
- Developed a change point detection model based on a unique 'Time-Consistency' hypothesis.

Anomaly Detection for Industrial Rotating Equipment

May. 2024

- Built an edge computing system for real-time anomaly detection using Arduino and Edge Impulse.
- Designed an end-to-end pipeline from sensor data collection to model quantization and real-time streaming via BLE.

Road Surface Detection using Smartphone Sensors

Dec. 2023

- Developed a system to classify road conditions (e.g., potholes) using smartphone accelerometer data.
- Applied a self-supervised (Contrastive Learning) approach and an LSTM-CNN hybrid model to analyze vibration signals.

EXPERIENCE

Graduate Research Assistant

Feb. 2025 – Present

Bayesian Statistics Lab, Inha University

Dept. of Statistics

- Researching and applying Machine Learning and Deep Learning methodologies to complex data such as multi-channel gas sensors and graph data.
- Specializing in Bayesian ML and Probabilistic AI Models to quantify prediction uncertainty and build more reliable systems.
- **Teaching Assistant** for undergraduate lab sessions:
 - *Data Visualization Lab* (Spring 2025)
 - *Regression Analysis Lab* (Fall 2025)

Undergraduate Research Intern

Sep. 2023 – Jul. 2024

Human Computer Interaction Lab, Inha University

Dept. of Computer Engineering

- Conducted research on applying deep learning models to various real-world sensor data (vibration, accelerometer, etc.).
- Responsible for the end-to-end development pipeline, from sensor data collection and preprocessing to model implementation and system deployment on edge devices.

Undergraduate Research Intern

Jul. 2024 – Feb. 2025

Bayesian Statistics Lab, Inha University

Dept. of Statistics

- Researched and implemented advanced statistical models, including Bayesian methods and Graphical Model.
- Focused on applying probabilistic approaches to solve complex prediction and analysis problems.

PUBLICATIONS & PRESENTATIONS

Publications

A Domain-Informed Composite Kernel Gaussian Process Classifier for Molecular Toxicity Prediction with Principled Uncertainty Quantification [Submitted]

2026.05

Journal of Cheminformatics

Authors: **Junhee Kim**, Seongil Jo, Jooyeon Lee, Jahyun Koo, Keunhong Jeong

One-class classification using Bayesian optimization [Under Revision]

2026.05

Journal of Big Data

Authors: **Junhee Kim**, Inyoung Baek, Yeongmin Lee, Jaeoh Kim, Seongil Jo

Predicting Flatfish Growth in Aquaculture Using Bayesian Deep Kernel Machines

Aug. 2025

Applied Sciences

Authors: **Junhee Kim**, Seong-Won Seo, Ho-Jin Jung, Hyun-Seok Jang, Han-kyu Lim and Seongil Jo

Research on Driving Pattern Analysis Techniques Using Contrastive Learning Method

Feb. 2024

Journal of the Korea Institute of Intelligent Transport Systems

Authors: Hoe Jun Jeong, Seung Ha Kim, **Junhee Kim**, Jang Woo Kwon

Presentations

Bayesian Kernel Ridge on GAT Embeddings for Molecular Prediction

Jun. 2025

BayesComp 2025, Singapore (Poster Presentation)

Predicting Movement Paths in Search and Rescue Operations Using RL <i>The 12th IASC-ARS Conference, Taipei, Taiwan (Poster Presentation)</i>	Dec. 2024
Driver Drowsiness Detection System - Improving SwinTransformer <i>2024 ITS Korea Spring Conference, Undergraduate Session (Oral Presentation)</i>	Dec. 2023

HONORS AND AWARDS

2025 Inha AI Challenge <i>Grand Award at Inha University AI Convergence Research Center</i>	Jul. 2025
2025 LG Aimers On · Offline AI Hackathon <i>Finalist 7th</i>	Apr. 2025
Anomaly Detection in Driving Patterns Using Contrastive Learning <i>Best Paper Award 2023 ITS Korea Fall Conference</i>	Aug. 2024
Road Surface Detection System using Smartphone Accelerometer Sensors <i>Bronze Prize at Fall 2023 Vertically Integrated Projects Presentation</i>	Dec. 2023

Patents & Software Registrations

SAM-BO: Bayesian Optimization for Sharpness-Aware Minimization <i>Software Registration (Registration No. C-2026-027538)</i> <i>Description: An algorithm combining Bayesian Optimization with the SAM technique to improve the generalization performance of deep learning models.</i>	2026.06
AI-based Movement Path Prediction System for Mountain Search and Rescue <i>Patent Application (Application No. 10-2024-0185328)</i>	2025.09

SKILLS

Programming Languages: Python, R

ML/DL Frameworks & Libraries: PyTorch, TensorFlow, Scikit-learn, Pandas, Scipy, Jax

Tools & Platforms: Git/GitHub, Docker, VS Code, RStudio, Notion