



Sangyun Bae

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I research intelligence. I give it to things.

Education

Kwangwoon University

Seoul, South Korea

B.S. in Information Convergence, Major in Data Science

Mar. 2021 – Feb. 2027 (Expected)

- Total GPA 3.98 / 4.5, Major GPA 4.02 / 4.5 (Credits Taken: 139)

Experience

Intern

Center for Humanoid Robotics, ARC Lab, KIST (Korea Institute of Science and Technology) *Mar. 2026 – Aug. 2026*

- Trained humanoid robot locomotion and motion-tracking policies using reinforcement learning (PPO, SAC)
- Developed and applied architectures and algorithms for learning robust locomotion policies
- Developed and applied system identification algorithms using real-world data to bridge the sim-to-real gap

Intern

ALLAI Inc.

Sep. 2025 – Feb. 2026

- Developed mobile robot ROS packages, including SLAM, Navigation, and YOLO-based perception, using NVIDIA Jetson, ROS 1/2, and Arduino
- Developed and deployed Jetson-based embedded AI by applying deep learning inference optimization with TensorRT and ONNX
- Developed Diffusion/GAN-based image generation and YOLO-based object detection models

NIPA NVIDIA AI Expert Course

KOSA (Korea AI & Software Industry Association)

Jul. 2025 – Aug. 2025

- Awarded **Excellence Prize** — Selected for Outstanding Final Project

College Student Mentor

Incheon Ganghwa Office of Education

May 2025 – Dec. 2025

Projects

Interpretable and Robust Locomotion Policy Learning via a History Encoder | *Robotics*

- Designed a latent representation-learning architecture that compresses proprioceptive data to encode state estimation and future-prediction information
- Built an end-to-end framework that trains locomotion policies more robust than the baseline, without additional data collection or fine-tuning
- Built a framework to quantitatively and visually analyze, compare, and evaluate policy performance

System Identification using CMA-ES | *Robotics*

- Adapted the PACE algorithm, originally designed for quadruped robots, to a single actuator and a biped humanoid robot
- Addressed a key limitation of the PACE algorithm by adding constraints for physically plausible dynamic parameters
- Extended the joint-level parameter search to link-level parameters such as CoM and mass

MuJoCo-G1 Sim-to-Sim Deployment | *Robotics*

- Built a real-time C++/ONNX Runtime deployment layer for an attention locomotion policy, verified via IsaacLab-to-MuJoCo sim-to-sim on both KIST's own humanoid and the Unitree G1
- Implemented a dual-rate control loop with a structured joint/foot/global observation pipeline built on low-level MuJoCo APIs

GMR/H2O Based Motion Retargeting | *Robotics*

- Integrated GMR (General Motion Retargeting) into CMU/LeCAR Lab's ASAP whole-body training pipeline for a 31-DOF biped humanoid
- Built a format-bridge script that reconstructs per-joint axis-angle poses from GMR's scalar joint outputs using the target robot's forward-kinematics model

AI System for Object Recognition and Local Map Generation for Disaster Rescue | *YOLO, UNet, Isaac Sim, Jetson*

- Built a real-time perception system for disaster rescue using synthetic image data generated in NVIDIA Isaac Sim
- Trained YOLO and UNet models on the synthetic dataset and deployed them on Jetson after optimizing with TensorRT
- Distinguished people and obstacles in disaster scenes and generated local maps for rescue operation planning

AI Outfit Recommendation System | *CNN, NLP*

- Built a clothing detection and outfit recommendation system using fine-tuned YOLOv8 and ResNet50
- Crawled clothing images from Musinsa to build a fine-tuning dataset for YOLOv8
- Trained a ResNet+MLP-based outfit scoring model using an expert-curated coordination matching dataset

Symptom-Based Hospital Finder | *Sentence Embedding, Cosine Similarity*

- Developed an NLP pipeline that matches patient symptoms to medical specialties using BERT/SBERT sentence embeddings
- Crawled and preprocessed hospital data (location, specialty, reviews) from Mododoc, then built a similarity-based hospital recommendation system

Raspberry Pi 4 AI Car | *CNN, Raspberry Pi*

- Implemented autonomous driving on Raspberry Pi 4 using CNN-based lane following and YOLOv5 obstacle/crosswalk detection

ROS 2 Autonomous AI Car (Jetson + Arduino) | *ROS 2, SLAM*

- Designed and built a SLAM-capable autonomous mobile robot using ROS 2 on Jetson hardware with Arduino motor control and a LiDAR sensor
- Implemented mapping with LiDAR and an autonomous driving system based on Nav2 path planning and remote control
- Implemented a Jetson-Arduino UART serial communication bridge for real-time control

Certifications & Awards

NVIDIA DLI

NVIDIA Deep Learning Institute

- Computer Vision for Industrial Inspection
- Bootstrapping Computer Vision Models with Synthetic Data
- Learn OpenUSD: Stages, Prims and Attributes
- Fundamentals of Accelerated Computing with Modern CUDA C++
- Fundamentals of Accelerated Computing with CUDA Python

2025 NIPA NVIDIA-AI Expert Course — Excellence Prize

KOSA (Korea AI & Software Industry Association)

Aug. 2025

Technical Skills

Languages: C, C++, Python, TypeScript

Tools & Infra: Git, Docker, CMake, Anaconda, Nomad, MySQL, MongoDB, Linux

AI / ML: PyTorch, CUDA, TensorRT, ONNX

Robotics: ROS 1/2, Arduino, Jetson, Isaac Sim, Isaac Lab, MuJoCo

Web / Backend: React, Next.js, Tailwind CSS, Flask