Jeongho Ahn

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Education

Ph.D. in Information Science and Electrical Engineering, Kyushu University, Japan Oct 2021 – Mar 2025

- Advisor: Prof. Ryo Kurazume
- Dissertation: "3D LiDAR-based Gait Analysis for Person Identification in Long-range Measurement Environments"

M.Eng. in Information Science and Electrical Engineering, Kyushu University, Japan Apr 2019 – Mar 2021

- Advisor: Prof. Ryo Kurazume

B.Eng. in Department of Electronic Engineering, Gachon University, Republic of Korea Mar 2012 – Feb 2019

- Advisor: Prof. Hyung-Seok Han
- GPA: 3.6 (Top 20%, under Relative Grading System)

Skills

Technical Interests: 3D Time-series Restoration & Upsampling, 3D Reconstruction, 3D Object Detection & Tracking, Segmentation, LiDAR-Camera Calibration, Person Identification, Gait Recognition

Programming: Python, C/C++, Java, VHDL, MATLAB

ML/DL Frameworks: PyTorch, TensorFlow, Scikit-learn

Tools & DevOps: Ubuntu, Git, Docker

Libraries & Middleware: ROS (Robot Operating System) 1/2, OpenCV, Open3D, PCL (Point Cloud Library), SMPL (A Skinned Multi-Person Linear Model), Maya

Embedded Platforms: Arduino, Raspberry Pi, Intel NUC, Jetson AGX Orin

Devices: LiDAR Sensors (Velodyne HDL-32E, VLP-32C, Pioneer SSL-S0, Livox MID-360), RGB-D Cameras (Intel RealSense D415, D435), Olfactory Sensors

Languages: English, Japanese, Korean

Experience

Postdoctoral Researcher | Faculty of Information Science and Electrical Engineering, Kyushu University, Fukuoka, Japan Apr 2025 – Present

- Developed a real-time ROS2-based person segmentation system through LiDAR–camera calibration to support mobile robot navigation.
- Designed algorithms to project pedestrian masks from image-based segmentation models onto the 3D LiDAR scenes and extract person point clouds by estimating camera-LiDAR intrinsics and extrinsics.
- Conducted field experiments to validate system performance at ranges up to 10 m in real-world environments.

Research Assistant | Faculty of Information Science and Electrical Engineering, Kyushu University, Fukuoka, Japan Oct 2024 – Mar 2025

- Developed real-time heavy machinery detection models for construction site automation.
- Fine-tuned RGB image-based segmentation models using datasets collected from 360° ultra-wide cameras.
- Achieved over 85% accuracy, comparable to systems incorporating depth sensors.

Research Intern | NASA Jet Propulsion Laboratory (JPL), CA, United States Feb 2024 – Apr 2024

- Designed deep learning-based restoration models to denoise images of Permanently Shadowed Regions (PSRs) on the lunar surface, reducing the uncertainty in VIPER rover and human traverse planning.
- Built diffusion process-based models using both task-specific and task-agnostic approaches, and conducted comparative performance evaluations.
- Achieved up to 12% improvement over prior baselines by restoring PSR images in the frequency domain.

Part-time Software Engineer | Living Robot Inc., Fukuoka, Japan Oct 2020 – Jan 2024

- Developed machine learning-based models using time–series data from olfactory sensors to predict health conditions based on patient excretion.
- Achieved over 80% accuracy and deployed the prediction system in a clinical environment.

Projects

3D Sequential Pedestrian Point Clouds Restoration May 2024 – Jan 2025

- Developed a restoration model for 3D LiDAR pedestrian data to enhance the generalization performance of gait-based person identification systems.
- Utilized conditional Diffusion Probabilistic Models (DPMs) with a spatial inpainting strategy tailored for range representations.
- Demonstrated superior generation quality on the SUSTeck1K dataset and achieved up to 20% identification accuracy improvement on real-world data collected using different sensor types and measurement distances.

Person Identification using 3D LiDAR Apr 2019 – Jan 2024

- Enhanced robustness of gait-based person identification models under challenging variations, such as multi-view angles and long-range measurements.
- Integrated multi-scale spatial resolutions with attention-based feature fusion to achieve more discriminative feature representations.
- Achieved up to 23% accuracy improvement over state-of-the-art methods, particularly in cross-view and cross-distance identification scenarios with sparse point clouds.

Data Augmentation for RGB–based Gait Recognition Oct 2021 – Jan 2025

- Proposed a feature-disentanglement-based augmentation framework by swapping pose and covariate attributes to diversify RGB gait datasets.
- Leveraged Disentangled Representation Learning (DRL) to preserve identity characteristics while augmenting viewpoint and clothing variations.
- Improved both generative fidelity and identification performance, achieving up to 5% accuracy gains on the CASIA-B dataset.

Publications – Journal Articles

Koki Yoshino, Kazuto Nakashima, Jeongho Ahn, Yumi Iwashita, and Ryo Kurazume. "RGB-based Gait Recognition with Disentangled Gait Feature Swapping". *IEEE Access*, Vol.12, pp. 115515–115531, 2024

Jeongho Ahn, Kazuto Nakashima, et al. "Learning Viewpoint-Invariant Features for LiDAR-Based Gait Recognition". *IEEE Access*, Vol. 11, pp. 129749–129762, 2023

Hiroyuki Yamada, Jeongho Ahn, et al. "Gait-based Person Identification using 3D LiDAR and Long Short-term Memory Deep Networks". *Advanced Robotics*, Vol. 34, No. 18, pp. 1201–1211, 2020

Publications – Conference Proceedings

Jeongho Ahn, Kazuto Nakashima, et al. "Gait Sequence Upsampling using Diffusion Models for Single LiDAR Sensors". *In Proceedings of the IEEE/SICE International Symposium on System Integration (SII)*, pp. 658–664, 2025.1.21–24, 2025

Koki Yoshino, Kazuto Nakashima, Jeongho Ahn, et al. "S2Gait: RGB-based Gait Recognition with Style Feature Sampling Data Augmentation". *In Proceedings of the IEEE/SICE International Symposium on System Integration (SII)*, pp. 375–380, 2025.1.21–24, 2025

Jeongho Ahn, Kazuto Nakashima, et al. "2V-Gait: Gait Recognition using 3D LiDAR Robust to Changes in Walking Direction and Measurement Distance". *In Proceedings of the IEEE/SICE International Symposium on System Integration (SII)*, pp. 602–607, 2022.1.9–12, 2022

Koki Yoshino, Kazuto Nakashima, Jeongho Ahn, et al. "Gait Recognition using Identity-Aware Adversarial Data Augmentation". *In Proceedings of the IEEE/SICE International Symposium on System Integration (SII)*, pp. 596–601, 2022.1.9–12, 2022

Publications – Domestic Conference in Japan

Meeting on Image Recognition and Understanding (MIRU) 2022, 2023, 2024, 2025

The Robotics Society of Japan (RSJ) 2021, 2022

Research Grant

Support for Pioneering Research Initiated by the Next Generation (SPRING), Oct 2021 – Sep 2024
Japan Science and Technology Agency (JST)

- Amount: ¥1,500,000

Awards

Outstanding Presentation Award, Three Minute Thesis (3MT) Competition, Mar 2025
Kyushu University

Grand Prize, Parking System Robot Competition, Gachon University Nov 2018

Member

Institute of Electrical and Electronics Engineers (IEEE)

IEEE Robotics and Automation Society (RAS)

Reviewer

IEEE International Conference on Robotics and Automation (ICRA) Oct 2025

Springer Nature Scientific Reports Jul, Sep 2025

Springer Nature Wireless Networks Jul 2025

Springer Nature Journal of NeuroEngineering and Rehabilitation Apr 2025

Activities

Student Representative, Japanese Language Program, Fukuoka University Oct 2018 – Sep 2019

Squad Leader, Military Police, Republic of Korea Army (Mandatory Service) Oct 2014 – Jul 2016