Jiho Park

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Research Interests

Broadly, computer vision and multimodal AI, including vision-language alignment, human-centric AI, 3D perception and reconstruction, robotics, and physical/embodied AI.

Education

Dongguk University — *Seoul, South Korea*
Ph.D. Student in Artificial Intelligence; Advisor: Prof. Jihie Kim — *Sept. 2024 - Present*

Dongguk University — *Seoul, South Korea*
M.Eng. in Artificial Intelligence; GPA: 4.5/4.5; Advisor: Prof. Jihie Kim — *Sept. 2022 - Aug. 2024*

Dongguk University — *Seoul, South Korea*
B.S. in Computer Science and Engineering; GPA: 4.0/4.5; graduated with honors, 95.0% — *Mar. 2017 - Aug. 2022*

Research Experience

Rainbow Robotics, Research Intern, Daejeon, South Korea — *Aug. 2025 - Mar. 2026*
Developed edge 3D vision for grasping and an image-generation-to-6-DoF robotic painting pipeline.

University of Toronto, Visiting Research Student, MIE, Toronto, Canada — *Jan. 2024 - Jun. 2024*
Conducted mobile robot vision research on 3D human detection and distance estimation with Cyberworks Robotics; resulted in ICAIIC 2025 oral paper.

Dongguk University / University of Birmingham, Collaborative Researcher — *Sept. 2023 - Dec. 2023*
Contributed to 3D hand-object reconstruction and egocentric compositional action recognition; resulted in AAAI 2025 poster paper.

University of Birmingham, Visiting Research Student, Computer Science, Birmingham, UK — *Sept. 2022 - Feb. 2023*
Conducted prosthetic-hand grasp control research after studying hand-object interaction and motion synthesis; resulted in IFSA 2023 oral paper.

Purdue University, Visiting Scholar, Computer and Information Technology, West Lafayette, USA — *Oct. 2021 - Dec. 2021*
Developed a cost-effective post-emergency power-management algorithm for agriculture-IoT precision irrigation.

Publications

* *denotes equal contribution.*

Conference Papers

1. **Jiho Park**, Sieun Choi, Jaeyoon Seo, Minho Sohn, Yeana Kim, and Jihie Kim. *SEA: Evaluating Sketch Abstraction Efficiency via Element-level Commonsense Visual Question Answering.* In **Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)**, 2026.
2. Tze Ho Elden Tse, Runyang Feng, Linfang Zheng, **Jiho Park**, Yixing Gao, Jihie Kim, Ales Leonardis, and Hyung Jin Chang. *Collaborative Learning for 3D Hand-Object Reconstruction and Compositional Action Recognition from Egocentric RGB Videos using Superquadrics.* In **Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)**, 2025. DOI: 10.1609/aaai.v39i7.32800.
3. Minseok Kong*, **Jiho Park***, Daye Lee*, Nikolaos Kourtzanidis, and Jungmin So. *Simulating Mobile Robot Vision: An Analysis of RGB-D versus RGB-Based Distance Accuracy and CPU Optimization.* In **Proceedings of the IEEE International Conference on Artificial Intelligence in Information and Communication (ICAIIC)**, 2025. DOI: 10.1109/ICAIIC64266.2025.10920652.
4. Sanghun Kim*, **Jiho Park***, Zhongqun Zhang, Jihie Kim, Hyung Jin Chang, and Hyeryung Jang. *Dexterous Hand-Object Grasp Control with Prosthetic Hand.* In **Proceedings of the World Congress of the International Fuzzy Systems Association (IFSA)**, 2023. PDF.

Journal Articles

1. **Jiho Park**, Junghye Kim, Yujung Gil, and Dongho Kim. *DGU-HAO: A Dataset With Daily Life Objects for Comprehensive 3D Human Action Analysis.* **IEEE Access**, 2024. DOI: 10.1109/ACCESS.2024.3358188.
2. Jihie Kim, Jae Jun Yang, Jaeha Song, SeongWoon Jo, Younghoon Kim, **Jiho Park**, Jin Bog Lee, Gun Woo Lee, and Sehan Park. *Detection of Cervical Foraminal Stenosis from Oblique Radiograph Using Convolutional Neural Network Algorithm.* **Yonsei Medical Journal**, 2024. DOI: 10.3349/ymj.2023.0091.
3. **Jiho Park***, Kwangryeol Park*, and Dongho Kim. *DGU-HAU: A Dataset for 3D Human Action Analysis on Utterances.* **Electronics**, 2023. DOI: 10.3390/electronics12234793.
4. **Jiho Park**, Jaejun Yang, Sehan Park, and Jihie Kim. *Deep Learning-Based Approaches for Classifying Foraminal Stenosis Using Cervical Spine Radiographs.* **Electronics**, 2022. DOI: 10.3390/electronics12010195.

Manuscripts Under Review

1. **Jiho Park**, Sieun Choi, Jaeyoon Seo, and Jihie Kim. *StableSketcher: Enhancing Diffusion Model for Pixel-based Sketch Generation via Visual Question Answering Feedback.* Under review.

Patent

- Patent Application No. 10-2023-0048150. *Method and system for classifying foraminal stenosis occurrence of the deep learning algorithm base utilizing the cervical spine X-ray.*

Selected Research Projects

SEA: Evaluating Sketch Abstraction Efficiency via Element-level Commonsense Visual Question Answering *Dongguk University, 2024 - 2026*

- Proposed an abstraction-aware evaluation framework for measuring sketch abstraction efficiency through element-level commonsense visual question answering.
- Constructed a multimodal dataset and benchmark to support standardized evaluation of sketch understanding.
- Led the project from problem formulation and benchmark design to experimental analysis and paper writing; resulted in a first-author CVPR 2026 paper.

StableSketcher: Enhancing Diffusion Models for Pixel-based Sketch Generation via Visual Question Answering Feedback *Dongguk University, Aug. 2024 - Aug. 2025*

- Fine-tuned the VAE component of a diffusion model to better capture sketch-specific visual characteristics and improve sketch generation quality.
- Applied reinforcement learning with a VQA-based reward function to improve text-image alignment and semantic consistency.
- Constructed a benchmark dataset with sketch-caption-question-answer triples to address the limitations of existing image-label datasets for sketch generation.
- Prepared the resulting work as a manuscript under review.

3D Human Detection and Distance Estimation Model for Mobile Robots *University of Toronto, Mar. 2024 - Jun. 2024*

- Implemented two ROS-based perception pipelines for efficient human detection: an RGB-D pipeline and an RGB-only pipeline using pre-trained YOLOv8 Nano and fine-tuned MobileNetV2 on the 3D KITTI dataset.
- Compared RGB-D and RGB camera setups for depth estimation, object detection, and mobile robot perception.
- Optimized models for low CPU usage using OpenVINO conversion and post-training quantization.
- Conducted experiments, analyzed results, and contributed to manuscript writing; resulted in an oral paper at ICAIIC 2025.

3D Hand-Object Action Recognition and Superquadric-based Object Reconstruction *Dongguk University / University of Birmingham, Sept. 2023 - Dec. 2023*

- Contributed to a learning framework for hand-object geometric reasoning that improves compositional action recognition from egocentric RGB videos.
- Trained superquadric parameters to represent 3D object geometry more accurately than conventional 3D bounding boxes.
- Evaluated compositional generalization using non-overlapping verb-noun combinations between training and testing sets.
- Resulted in a poster paper at AAAI 2025.

Multimodal Care Chatbot to Enhance Cognitive Function in Older Adults through Sketch-based Interactions *Dongguk University* *Mar. 2023 - Dec. 2023*

- Developed sketch-generation and sketch-editing components for a multimodal care chatbot designed to support cognitive activities through drawing-based interaction.
- Built a sketch image dataset for fine-tuning Stable Diffusion and ControlNet models, addressing noise and quality limitations in existing sketch datasets.
- Contributed to the system design and experimental development of the sketch interaction module.
- Awarded the SK CEO Award at the ICT Challenge 2023.

3D Human Motion Capture Dataset Construction and Validation *Dongguk University* *May 2022 - Dec. 2023*

- Built and validated two 3D human motion datasets: DGU-HAO, a dataset with daily-life objects for comprehensive 3D human action analysis, and DGU-HAU, a dataset for 3D human action analysis on utterances.
- Analyzed dataset quality and validated DGU-HAO using the 3D human action recognition model MMNet.
- Contributed to experimental analysis and manuscript writing; resulted in publications in IEEE Access and Electronics.

Dexterous Hand-Object Grasp Control with Prosthetic Hand *University of Birmingham* *Sept. 2022 - Feb. 2023*

- Conducted research on enabling prosthetic hands to interact naturally with objects, drawing on studies of human hand-object interaction and the D-Grasp project.
- Selected the Modular Prosthetic Limb model as the prosthetic hand and RaiSim as the physics engine for training.
- Transferred the Modular Prosthetic Limb model from MuJoCo to RaiSim and explored training with the DexYCB dataset using domain adaptation.
- Presented the resulting work orally at IFSA 2023.

Deep Learning-Based Approaches for Classifying Foraminal Stenosis Using Cervical Spine Radiographs *Dongguk University* *Jun. 2022 - Dec. 2022*

- Designed a deep learning framework to classify cervical foraminal stenosis using X-ray images, which are less expensive and more accessible than MRI-based diagnostic tests.
- Applied YOLOv5, spatial transformer networks, histogram equalization, transfer learning, and fine-tuning to improve classification performance.
- Resulted in one patent application and one journal article in Electronics.

Post-Emergency Power Management in Agriculture-IoT Precision Irrigation Using a Cost-Effective Algorithm *Purdue University* *Oct. 2021 - Dec. 2021*

- Developed a power operation algorithm for automatic irrigation systems to support crop care during power outages caused by emergencies or natural disasters.
- Implemented the power-efficiency algorithm in Python and compared its performance against the existing system.
- Communicated sensor data between end devices and the cloud using LoRa, LoRaWAN, The Things Stack, a LoRaWAN gateway, and Node-RED.

Additional Engineering Projects

- **Pink Voice:** Developed an Android-based QR authentication and real-time subway seat status-checking system to improve the effectiveness of subway seats reserved for pregnant women; designed Arduino and sensor circuits to collect pressure-sensor data and transfer it to a database; awarded second place at the Value-Up Program.
- **Self-Driving Soccer Robot:** Implemented line tracing with a color sensor and ball detection with an infrared sensor using LEGO Mindstorms and RobotC; analyzed soccer-match scenarios, developed robot strategies, and won first place in the tournament.
- **Additional undergraduate systems:** Built course projects in OCR-based parking reservation, IoT-based power control, WebRTC video conferencing, gesture-based video editing, iOS app development, and travel recommendation web services.

Honors, Awards, and Fellowships

Government-Sponsored Fellowships

- **Visiting Graduate Fellowship, University of Toronto**, Graduate School of Mechanical and Industrial Engineering, Jan. 2024 - Jun. 2024. Sponsored by the Ministry of Science and ICT, Korea; covered stipend, tuition, airfare, and health insurance. Approx. USD 37.3K / KRW 55M.
- **Visiting Graduate Fellowship, University of Birmingham**, Department of Computer Science, Aug. 2022 - Feb. 2023. Sponsored by the Ministry of Science and ICT, Korea; covered stipend, living allowance, airfare, and health insurance. Approx. USD 18.3K / KRW 27M.
- **Undergraduate Visiting Fellowship, Purdue University**, Department of Computer and Information Technology, Oct. 2021 - Dec. 2021. Sponsored by the Ministry of Science and ICT, Korea; covered tuition, living allowance, airfare, and health insurance. Approx. USD 11.5K / KRW 17M.

Awards

- SK CEO Award, ICT Challenge, Sept. 2023.
- Encouragement Prize, The Korean Institute of Communications and Information Sciences, Feb. 2022.
- Encouragement Prize, Korea Data Agency, Aug. 2021.
- Excellence Prize, Capstone Design Value-Up Program, Dongguk University, Feb. 2021.

Selected Scholarships

- Dongguk Future Leaders Scholarship, Spring 2022.
- Merit Scholarship for Academic Achievement, Spring 2021.
- Dongguk Love 1.1.1 Scholarship, Spring 2021.
- SW Excellence Scholarship, Spring 2021.
- Merit Scholarship for Top Academic Achievement in Course, Fall 2018.

Teaching and Academic Service

Academic Service

- Reviewer (Program Committee), AAAI 2026.
- Reviewer, Human-AI Co-Creativity @ ICML 2026: Workshop on Generative AI, Creativity, and Human-AI Co-Creation.
- Mentor, Career Mentoring Program, Dongguk University, Fall 2025.

Teaching Assistant *Dongguk University*

- Independent Capstone Design — Mar. 2026 - Present
- Convergence Capstone Design — Mar. 2025 - Jun. 2025
- Introduction to Internet of Things — Mar. 2025 - Jun. 2025
- Introduction to Programming — Mar. 2025 - Jun. 2025
- Introduction to Deep Learning — Sept. 2024 - Dec. 2024
- Introduction to Artificial Intelligence — Sept. 2023 - Dec. 2023
- Data Structure (C++) — Mar. 2022 - Jun. 2022
- Data Structure (C++) — Mar. 2019 - Jun. 2019

Skills

Certifications: SQLD (SQL Developer), Korea Data Agency, 2020.
Languages: Python, C++, C, Java, JavaScript, SQL, Swift.
Frameworks: PyTorch, TensorFlow, ROS2, OpenCV, OpenVINO, Flask, React.js, MuJoCo, RaiSim.