

Joonhyung Lee

AI RESEARCH ENGINEER

Seoul, Republic of Korea

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전문연구요원(현역/신규) 지원이 가능한 포지션을 희망합니다.

Work Experience

ATLO

CTO, FULL-TIME

- Built a multimodal AI agent with emotion-aware dialogue generation, deployed on robot, iOS, and web platforms

Seoul, S.Korea

Jun. 2024 – May. 2025

KAIST

MACHINE DECISION INTELLIGENCE LAB, UNDERGRADUATE RESEARCH INTERN

- Implemented fundamental RL algorithms (e.g., Q-learning, Policy Gradient, SAC, and PPO methods) ([Code](#))
- Supervisor: [Donghwan Lee](#)

Daejeon, S.Korea

Jan. 2022 – Jun. 2022

Education

Korea University

MASTER OF SCIENCE IN ARTIFICIAL INTELLIGENCE

- Supervisor: [Sungjoon Choi](#)
- Cumulative GPA: 4.14/4.50

Seoul, S.Korea

Sep. 2022 – Aug. 2024

Korea University

BACHELOR OF SCIENCE IN ELECTRO-MECHANICAL SYSTEMS AND ENGINEERING

- Cumulative GPA: 4.13/4.50 | Major GPA: 4.31/4.50 | Credit: 146

Sejong, S.Korea

Mar. 2018 – Feb. 2022

Publications

SPOTS: Stable Placement of Objects with Reasoning in Semi-Autonomous Teleoperation Systems

JOONHYUNG LEE, SANGBEOM PARK, JEONGEUN PARK, KYUNGJAE LEE, AND SUNGJOON CHOI

- [Project Page](#) | [Code](#) | [Paper](#) | [Video](#) | [Talk \(15 min\)](#)

ICRA

2024

Visual Preference Inference: An Image Sequence-Based Preference Reasoning in Tabletop Object Manipulation

JOONHYUNG LEE, SANGBEOM PARK, YONGIN KWON, JEMIN LEE, SUNGJOON CHOI

- [Project Page](#) | [Code](#) | [Paper](#) | [Video](#) | [Talk \(10 min\)](#) | [Poster](#)
- Presented on [Vision-Language Models for Navigation and Manipulation \(VLMNM\)](#) at ICRA 2024 Workshop

IROS

2024

Quality-Diversity based Semi-Autonomous Teleoperation using Reinforcement Learning

SANGBEOM PARK, TAERIM YOON, JOONHYUNG LEE, SUNGHYUN PARK, AND SUNGJOON CHOI

- [Project Page](#) | [Paper](#) | [Video](#) | [Poster](#)
- Published in JCR Top 10% Journal in Computer Science, Artificial Intelligence & Neurosciences (Imapct Factor: 7.8)
- Presented on [Physical Human-Robot Interaction](#) at ICRA 2024 Workshop

Neural Networks

2024

CLARA: classifying and disambiguating user commands for reliable interactive robotic agents

JEONGEUN PARK, SEUNGWON LIM, JOONHYUNG LEE, SANGBEOM PARK, MINSUK CHANG, YOUNGJAE YU, AND SUNGJOON CHOI

- [Project Page](#) | [Paper](#) | [Video](#)

RA-L

2024

Robust Detection for Autonomous Elevator Boarding Using a Mobile Manipulator

SEUNGYOUN SHIN, JOONHYUNG LEE, JUNHYUG NOH, AND SUNGJOON CHOI

- [Project Page](#) | [Paper](#) | [Video](#)

ACPR

2023

Skills

Programming Python, C++, C#, MATLAB

Libraries PyTorch, ROS2

Physics Simulation MuJoCo, Isaac Sim, Unity, Gazebo

Realworld Robots UR5e, Franka Panda, GAEMI, Pioneer 3-DX, DJI F450 Drone

DevOps Docker, AWS, EC2

Languages Korean (Native), English (Fluent)

Highly motivated with a strong ability to learn quickly and adapt to new challenges.

Projects

Interactive Multimodal Agent for Emotion-Aware Dialogue

AI RESEARCH ENGINEER & CTO

ATLO
Jun. 2024 - May. 2025

- Launched and operated a web-based dialogue agent service ATTO and iOS app DITTO.
- Led the development of multimodal robot hardware with a low-latency speech pipeline for real-time interaction.
- Implemented a RAG system using LangChain and LLMs with prompt engineering.
- Secured seed funding from Strong Ventures.
- Achieved 54,000+ conversation sessions in four months.
- Materials: APP service, Web service, H/W architecture, Videos (ATTO, DITTO)

LLM-Based Human-Preference-Aware Robotic Systems

M.S. RESEARCH PROJECT

ETRI
Oct. 2023 - Mar. 2024

- Developed LLM-powered robot behavior prediction system converting natural language commands to robot action sequences.
- Built human-robot dialogue interface with uncertainty handling and user preference feedback collection system.
- Implemented language-to-trajectory conversion module using Python and ROS2, deployed on Jetson AGX Orin platform. (Code)

Elevator Recognition System for Indoor Autonomous Robots

M.S. RESEARCH PROJECT

ROBOTIS
Sep. 2022 - Jul. 2023

- Developed hierarchical detection system using YOLOv7 for elevator state recognition (e.g., floor, door status, direction).
- Implemented data augmentation techniques through diffusion methods, improving mAP@0.5 from 0.730 to 0.784.
- Deployed on Jetson AGX Orin platform with ROS2, successfully integrated into ROBOTIS GAEMI Robot product.
- Demo Videos: Final Demo | ROBOTIS Demo (#1, #2) | Campus Demo

Automation Maintenance using Mobile Manipulator

M.S. RESEARCH PROJECT

SAMSUNG
Sep. 2022 - Sep. 2023

- Developed navigation and manipulation capabilities for mobile manipulators in factory settings
- Implemented simulation environments in MuJoCo for autonomous maintenance tasks. (Code)

Presentations

Perception (Semantic Scene Understanding)

CONFERENCE PRESENTATION

Abu Dhabi, UAE
Oct. 2024

Oral presentation at 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Perception (Semantic Scene Understanding)

CONFERENCE PRESENTATION

Yokohama, Japan
May, 2024

Oral presentation at 2024 IEEE International Conference on Robotics and Automation (ICRA)

Vision-Language Models for Navigation and Manipulation

CONFERENCE WORKSHOP

Yokohama, Japan
May, 2024

Poster presentation at 2024 IEEE International Conference on Robotics and Automation (ICRA)

Physical Human-Robot Interaction

CONFERENCE WORKSHOP

Yokohama, Japan
May, 2024

Poster presentation at 2024 IEEE International Conference on Robotics and Automation (ICRA)

Patent

2024 10-2024-0023216, Visual Preference Inference: An Image Sequence-Based Preference Reasoning in
Tabletop Object Manipulation

Korea

Honors & Awards

- 2022 Scholarship for Admission Excellence (Half-Funding), Korea University
- 2020 Gold Prize, Engineering School Student Academic Conference, Korea University
- 2020 Silver Prize, Engineering School Student Academic Conference, Korea University
- 2019-2022 Dean's List, Korea University
- 2019-2022 Best Tutor Award, Statics, Electric Circuit, Control Engineering, Korea University
- 2018-2022 Scholarship for Academic Excellence (Full-Funding), Korea Student Aid Foundation

Extracurricular Activity

Academic Service

REVIEWER OF THE CONFERENCE

IROS
2025