TAEWOOK KANG

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RESEARCH INTERESTS

- Embodied AI, Open-ended Generalist Agents, Video understanding

EDUCATION

Hanyang University   Seoul, Republic of Korea
B.S. in Computer Science, GPA: 4.28 / 4.5   *Mar. 2021 - Present*

PUBLICATIONS

Manuscripts

- [M1] **Taewook Kang**, Bum-Jae You, Juyoun Park, and Yisoo Lee. "An Online Anomaly Detection Method for Robots based on a Flexible and Sparse Latent Space." *SCI journal.* under review.

Conferences

- [C1] **Taewook Kang***, Youjung Bae*, Jiwon Sung*, and Eun-sol Kim. "A Frame Sampling Method for Efficient Video-based Embodied Question Answering." *Korea Software Congress 2024.* (* indicates equal contribution) [paper]

RESEARCH EXPERIENCE AND PROJECTS

Machine Learning and Mind Lab, KAIST   Daejeon, Republic of Korea
Undergraduate Researcher, Adviser: Prof. Sungjin Ahn   *Jan. 2025 - Present (Remote from Mar. 2025)*

- Constructed a video-text caption dataset for video CLIP training to develop a text-conditioned agent controller in an open-ended RL benchmark environment.
- Participated in the design and implementation of a rule-based behavior detection system using offline action-state sequences to construct the dateset.

HYU Machine Learning Lab, Hanyang University   Seoul, Republic of Korea
Undergraduate Researcher, Adviser: Prof. Eun-sol Kim   *Sep. 2024 - Nov. 2024*

- Enhanced a multimodal LLM-based embodied AI agent by efficiently retrieving question-relevant segments in videos, achieving a 16% improvement in question answering performance over the previous framework. [C1] [website]

Advanced Robot Control Lab, Korea Institute of Science and Technology   Seoul, Republic of Korea
Undergraduate Researcher, Adviser: Dr. Yisoo Lee   *Sep. 2023 - Jun. 2024*

- Developed an unsupervised learning-based online anomaly detection model for robotic operations by combining deep generative models, resulting in a performance improvement of up to 9.75% in the area under the ROC curve. [M1]
- Applied the above anomaly detection model in robotic operations on an on-device system. [website]
- Designed and implemented object delivery sequences and manipulator control systems for last-mile delivery robots using ROS, Python, and C++. [website]
- Refactored the code for a research project on a reinforcement learning-based robot motion planning and control system. [github]

AWARDS AND HONORS

- Academic Excellence Award, Hanyang University   *Spring 2021 - Spring 2023, Fall 2024*
- Scholarship for co-op semester, Hanyang University   *Fall 2023, Spring 2024*
- Merit Based Scholarship, Hanyang University   *Fall 2021, Spring 2023, Spring 2025*
- Career Based Scholarship, Hanyang University   *Spring 2021 - Fall 2022*

ADDITIONAL PROJECTS

Senior Research Project, Hanyang University   Seoul, Republic of Korea
Team Leader, Advisor: Prof. Eun-sol Kim   *Mar. 2024 - Oct. 2024*

- Joined HYU Machine Learning Lab during the project to expand and deepen the research.

Hanyang University Entrepreneurship Club   Seoul, Republic of Korea
Front-end Developer   *Jun. 2023 - Dec. 2023*

- Implemented login, sign-up, and student authentication using student ID cards features in a mobile application with Flutter and Firebase.

TEACHING AND TUTORING

Math Tutoring   Seoul, Republic of Korea
Teaching Assistant   *Jul. 2024 - Dec. 2024*

- Tutoring high school students in mathematics.

Community Service   Seoul, Republic of Korea
Volunteer Teacher   *Mar. 2022 - May. 2022*

- Taught middle school students in math and science as a volunteer at a local community center.

ALOHA (The algorithm club at Hanyang University)   Seoul, Republic of Korea
Beginner Class Tutor   *Mar. 2022 - Jun. 2022*

- Provided weekly tutoring sessions to freshman students, focusing on foundational programming concepts, algorithms, and problem-solving techniques using C/C++.

LEADERSHIP AND ACTIVITIES

- **Team Leader**, Senior Research Project, Hanyang University   *Mar. 2024 - Oct. 2024*
- **Drafter**, CS Student Council Constitution Drafting Committee   *Mar. 2022 - Jun. 2022*
- **CS Student Council Officer**, Hanyang University   *Sep. 2021 - Jun. 2022*

TECHNICAL SKILLS

- **Programming languages**: Python, C/C++, JAVA
- **Libraries and Frameworks**: PyTorch, Python scientific libraries (NumPy, Pandas, etc.)
- **Tools**: Git, LaTeX, SQL, Robot Operating System (ROS)
- **Development environments**: Linux, macOS, WSL