

RESEARCH INTERESTS

Reinforcement Learning & Multi-Agent RL. Decentralized decision-making, partial observability, hierarchical coordination, and scalable cooperative learning [C2] [J2] [W5]

LLM Inference & Agentic Reasoning. Test-time computation, multilingual ensembles and debate, efficient search, and Theory-of-Mind-grounded action [C1] [W2]

Preference-Based RL & Alignment. Learning human intent from limited or uncertain feedback, preference augmentation, and reward-free alignment [C3] [J1] [J2] [W5]

AI for Autonomous & Defense Systems. Explainable decision support, course-of-action recommendation, and local-sensing multi-robot situational awareness [C4] [C5]

EDUCATION

KAIST · Kim Jaechul Graduate School of AI

Ph.D. in Artificial Intelligence · Advisor: Prof. Se-Young Yun

Spring 2023 – Present

Arizona State University

M.S. in Computer Engineering · Advisor: Prof. Theodore P. Pavlic

Thesis: *Comparison of Team Robot Localization by Input Difference for Deep Neural Network Model*

Aug. 2018 – May 2020

Korea Military Academy

B.S. in Information Science · B.S. in Military Art and Science

Feb. 2011 – Feb. 2015

PUBLICATIONS

International Conferences

- [C1][W1] **Sehyeok Kang***, Jaejun Ryu*, and Se-Young Yun. “**MELD: Multilingual Ensemble via Logical Debate.**” *Conference on Language Modeling (COLM)*, 2026. Accepted. Earlier version at the ACL 2026 MeLLM Workshop. *Equal contribution.
- [C2][W6] **Sehyeok Kang***, Yongsik Lee*, Gahee Kim, Song Chong, and Se-Young Yun. “**MA²E: Addressing Partial Observability in Multi-Agent Reinforcement Learning with Masked Auto-Encoder.**” *International Conference on Learning Representations (ICLR)*, 2025. Earlier version at the ICLR 2024 GenAI4DM Workshop. *Equal contribution.
- [C3] Minu Kim*, Yongsik Lee*, **Sehyeok Kang**, Jihwan Oh, Song Chong, and Se-Young Yun. “**Preference Alignment with Flow Matching.**” *Advances in Neural Information Processing Systems (NeurIPS)*, vol. 37, 2024, pp. 35140–35164.
- [C4] **Sehyeok Kang**, Taeyeong Choi, and Theodore P. Pavlic. “**How Far Should I Watch? Quantifying the Effect of Various Observational Capabilities on Long-Range Situational Awareness in Multi-Robot Teams.**” *IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS)*, 2020, pp. 146–152. Short paper.
- [C5] Taeyeong Choi, **Sehyeok Kang**, and Theodore P. Pavlic. “**Learning Local Behavioral Sequences to Better Infer Non-Local Properties in Real Multi-Robot Systems.**” *IEEE International Conference on Robotics and Automation (ICRA)*, 2020, pp. 2138–2144.

International Journals

- [J1][W4] **Sehyeok Kang***, Jaewook Jeong*, and Se-Young Yun. “**CUDA: Capturing Uncertainty and Diversity in Preference Feedback Augmentation.**” *Transactions on Machine Learning Research (TMLR)*, 2026. Earlier version presented orally at the ICML 2025 MOFA Workshop. *Equal contribution.
- [J2] **Sehyeok Kang**, Minu Kim, Jihwan Oh, and Se-Young Yun. “**Dual Preference Learning for Multi-Agent Reinforcement Learning.**” *IEEE Access*, vol. 14, pp. 113–130, 2026 (online 2025).

International Workshops

- [W2] **Sehyeok Kang**, Jihwan Oh, and Se-Young Yun. “**Bridging the Gap between Theory of Mind and Action in LLMs.**” *ICLR 2026 Workshop on Agents in the Wild: Safety, Security, and Beyond*, 2026.
- [W3] **Sehyeok Kang**, Youngjin Ko, Hyeonjun Kim, Myungjoo Kang, and Se-Young Yun. “**From Vision-Language to Preference: CLIP as a Discriminator.**” *IROS 2025 AIR4S Workshop*, 2025.
- [W5] **Sehyeok Kang**, Yongsik Lee, and Se-Young Yun. “**DPM: Dual Preferences-Based Multi-Agent Reinforcement Learning.**” *ICML 2024 Workshop on Models of Human Feedback for AI Alignment*, 2024.

Domestic Publications (Korea)

- [K1] Seohyun Kim, **Sehyeok Kang**, Jihwan Oh, and Se-Young Yun. “**Value-Based Adaptive MCTS for Efficient LLM Reasoning.**” *Journal of the Korea Society of Digital Industry and Information Management*, 21(4), 2025, pp. 77–88.
- [K2] Jihwan Oh, Sangmin Hwang, **Sehyeok Kang**, and Se-Young Yun. “**An Analysis of How Authority Bias Impacts Decision-Making in LLM Agent Collaboration.**” *Journal of the Korea Society of Digital Industry and Information Management*, 21(4), 2025, pp. 15–26.
- [K3] **Sehyeok Kang**, Yongsik Lee, Seohyun Kim, and Se-Young Yun. “**Incorporating Human Intent into Preference-Based Multi-Agent Reinforcement Learning.**” *KIMST General and Fall Conferences*, 2025. Poster.

Domestic Publications (Korea) — continued

[K4] Sehyeok Kang. “Meta-Reinforcement Learning for Rapid Adaptation in Military Wargames.” *Graduate Student Defense Academic Conference*, 2025.

[K5] Sehyeok Kang, Yongsik Lee, and Se-Young Yun. “A Study on Solving the Sparse-Reward Problem in Multi-Agent Reinforcement Learning Using Preference-Based Learning.” *KIMST Annual Conference*, 2024. Oral presentation.

[K6] Changho Son, Jiwoong Cho, Youngmin Kim, and Sehyeok Kang. “A Study on the Analysis of Defense Data from Multiple Sources Using Data Science: Focusing on Case Studies.” *Journal of the Military Operations Research Society of Korea*, 49(2), 2023, pp. 88–102.

[K7] Minhyeok Kim, Sehyeok Kang, Seok-Joo Doo, and Daeyoung Kim. “X-Band RADAR Reflected Signal Measurement of Gallium-Based Liquid Metal.” *Journal of the Korea Institute of Military Science and Technology*, 26(3), 2023, pp. 246–251.

[K8] Sehyeok Kang. “CAMICAP: A Study on the Performance Improvement Algorithm of RICAP-Based Data Augmentation Techniques Using Grad-CAM.” *Journal of Korean Institute of Intelligent Systems*, 32(4), 2022, pp. 299–306.

[K9] Sehyeok Kang. “Research of a Method of Generating an Adversarial Sample Using Grad-CAM.” *Journal of Korea Multimedia Society*, 25(6), 2022, pp. 878–885.

[K10] Sehyeok Kang and Jiwoong Cho. “Shooting Sound Analysis Using Convolutional Neural Networks and Long Short-Term Memory.” *Journal of the Acoustical Society of Korea*, 41(3), 2022, pp. 312–318.

[K11] Sehyeok Kang. “Research on Unidentified Tank Classification Using Few-Shot Learning.” *KICS Summer Conference*, 2022, pp. 392–393.

[K12] Sihun Kim and Sehyeok Kang. “Development of a Deep-Learning-Based Battlefield Gun-Noise Analysis Model.” *KICS Summer Conference*, 2022, pp. 379–381.

[K13] Ho-Gil Kim, Sehyeok Kang, et al. *Cyber Electronic Warfare*. Golden Pine Books, 2022.

Numbering: C = international conference · W = international workshop · J = international journal · K = domestic publication. Combined labels denote the same research appearing in both archival and workshop venues.

RESEARCH PROJECTS

Center for Applied Research in Artificial Intelligence (CARAI)	Apr. 2023 – Apr. 2026
Division 4: AI for Decision Making and Recommendation · MX-44: Explainable Reinforcement Learning for Optimal Course-of-Action Recommendation · Project Manager (PM)	
Research Advisory on Friendly-Force Behavior Information and Unit/Force-Deployment Alternatives	Mar. 2023 – Dec. 2024
Project Manager (PM)	
Multi-Source Defense Data Analysis Using Data-Mining Technology	Mar. 2022
Korea Army Academy at Yeongcheon · Researcher	
Application of Intelligent Technology to Ground-Based Electronic-Warfare Systems	Apr. – Jul. 2022
Agency for Defense Development · Researcher	
Basic Research on the Next Degree-Education System	Mar. – Oct. 2021
Korea Army Academy at Yeongcheon · Researcher	

EXPERIENCE & ACTIVITIES

Graduate Researcher · OSI Lab, KAIST Kim Jaechul Graduate School of AI	Mar. 2023 – Present
Assistant Professor, Department of Electrical Engineering · Korea Army Academy at Yeongcheon	Jun. 2022 – Jan. 2023
Also served as Head of the Artificial Intelligence Department	
Lecturer, Department of Electrical Engineering · Korea Army Academy at Yeongcheon	Mar. 2021 – Jun. 2022
Digital Circuit Design; Digital Control Engineering; Electric Circuits II; Cyber Electronic Warfare	
Republic of Korea Army · Platoon Leader, Operations Officer, and Company Commander	Jun. 2015 – Oct. 2017

AWARDS & HONORS

Dec. 2025	Top Reviewer, NeurIPS 2025	Nov. 2025	Encouragement Award, Graduate Student Defense Academic Conference · Meta-RL for Rapid Adaptation in Military Wargames
Jun. 2024	Outstanding Paper Award, Korea Institute of Military Science and Technology	2022	Commendation of the Commandant of Cadets, Military Training Support
2022	Commendation of the Superintendent, Excellent Lecture Video Contest	2022	Commendation of the Superintendent, KAAI Program Support
2021	Academic Excellence Award, Chief of Staff of the Republic of Korea Army	2020	Encouragement Award, Republic of Korea Army Big Data Analysis Contest
2017	Commendation of the 27th Infantry Division Commander	2015	Departmental Honor Prize, Korea Military Academy

SKILLS

Programming & ML: Python (PyTorch)	Languages: Korean (native), English (professional; TOEFL 100)
------------------------------------	---