Yongjun **Cho**

AI RESEARCHER

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*"Together, researching **AI** to be humanity's **companion**."*

Summary

Senior Research Scientist specializing in **Embodied AI** and **Robot Learning**. My research aims to achieve **robust generalization** in robotics by integrating **Vision-Language-Action (VLA) models** with **large-scale physical interaction data**. Currently, I am bridging the gap between research and real-world deployment by developing **commonsense-aware navigation systems**, while actively expanding these generalizable methodologies to robotic manipulation. My work addresses fundamental challenges in robot learning, including **Sim-to-Real transfer** and **data efficiency**. Furthermore, I am dedicated to accelerating robot learning by releasing **open-source benchmarks** and datasets, and fostering a **research ecosystem** that is accessible across diverse robotic hardware.

Keywords: Embodied AI, Robot Learning, Vision-Language Models, Imitation Learning, Sim-to-Real Transfer.

Experience

Maum AI   *Seongnam, S.Korea*

SENIOR RESEARCH SCIENTIST   *Nov 2024 - Present*

- Established a commercial pipeline for **VLA navigation models** (1B–7B), optimizing large-scale training and inference efficiency.
- Enhanced **Sim-to-Real** transfer and policy performance via domain randomization and efficient **human intervention** pipelines.
- Led **open-source initiatives** by releasing benchmarks, datasets, and simulation tools to accelerate research in robot learning.

RESEARCH SCIENTIST   *May 2024 - Oct 2024*

- Led the ideation and fundamental research for commonsense-aware navigation systems **CANVAS [3]**.
- Designed comprehensive evaluation protocols spanning **Nvidia Isaac Sim** and real-world environments.
- Developed the foundational pipeline for large-scale **data collection**, and model training.

Deargen Inc.   *Seoul, S.Korea*

MACHINE LEARNING RESEARCHER   *April. 2022 - April. 2024*

- Developed the overall Drug Target Interaction (DTI) model architecture and conducted data crawling and processing.
- Created a fine-tuning framework and provided services to an **international big pharma corporation**.
- Developed a **reinforcement learning** model to enhance pocket-conditioned **3D molecule generation model [4]**

Education

KAIST (Korea Advanced Institute of Science and Technology)   *Daejeon, S.Korea*

M.S. IN SCHOOL OF ELECTRICAL ENGINEERING   *Mar. 2020 - Mar. 2022*

- Advisor: **Dong Eui Chang** 🔗
- Developed **autonomous guidewire navigation [5]** systems using **Reinforcement Learning** and **Sim-to-Real** transfer.
- Led multiple **autonomous drone** projects, including **vision-only navigation** and custom radio control systems. Conducted R&D with **HD Korea Shipbuilding** to develop ship assistance drones featuring **relative path planning** and AI-driven perception.
- Investigated real-time **anomaly detection [7]** for quadrotor actuators using multivariate statistical analysis.
- Awarded the **Grand Prize** in the **Autonomous Drone Competition** hosted by the **Defense Acquisition Program Administration (DAPA)**.

KAIST (Korea Advanced Institute of Science and Technology)   *Daejeon, S.Korea*

B.S. IN DEPARTMENT OF MECHANICAL ENGINEERING   *Mar. 2015 - Mar. 2020*

- Development of an Autonomous Driving Robot for Library Inventory Management as a Graduation Project

[☞] Publications

† denotes equal contribution, * denotes corresponding author

[1] CostNav: A Navigation Benchmark for Cost-Aware Evaluation of Embodied Agents %

ARXIV PREPRINT 2026

Haebin Seong†, Sungmin Kim†, Yongjun Cho†, Myunchul Joe, Geunwoo Kim, Yubeen Park, Sunhoo Kim, Yoonshik Kim, Suhwan Choi, Jaeyoon Jung, Jiyong Youn, Jinmyung Kwak, Sunghee Ahn, Jaemin Lee, Younggil Do, Seungyeop Yi, Woojin Cheong, Minhyeok Oh, Minchan Kim, Yoonseok Kang, Seongjae Kang, Samwoo Seong, Youngjae Yu*, Yunsung Lee*

- Introduced CostNav, the first Economic Navigation Benchmark that evaluates physical AI agents through comprehensive cost-revenue analysis aligned with real-world business operations, integrating industry-standard data (SEC filings, AIS injury reports) with Isaac Sim's collision and cargo dynamics.
- Quantitatively exposed the gap between navigation research metrics and commercial viability, demonstrating that optimizing for task success fundamentally differs from optimizing for economic deployment.
- Evaluated rule-based Nav2 navigation showing current approaches are not economically viable with contribution margins of -22.81$/run (AMCL) and -12.87$/run (GPS), challenging the community to develop economically viable navigation policies.

[2] D2E: Scaling Vision-Action Pretraining on Desktop Data for Transfer to Embodied AI %

THE FOURTEENTH INTERNATIONAL CONFERENCE ON LEARNING REPRESENTATIONS (ICLR) 2026

Suhwan Choi†, Jaeyoon Jung†, Haebin Seong†, Minchan Kim, Minyeong Kim, Yongjun Cho, Yoonshik Kim, Yubeen Park, Youngjae Yu*, Yunsung Lee*

- Proposed the D2E (Desktop to Embodied AI) framework, which leverages scalable desktop and gaming data to pretrain agents for physical robotics tasks, bypassing costly physical data collection.
- Using 1.3K+ hours of human and pseudo-labeled data, achieved 96.6% success on the LIBERO manipulation benchmark and 83.3% on the CANVAS navigation benchmark, validating the transfer from digital to physical domains.
- Committed to publicly releasing the OWA toolkit, all datasets, and the VAPT-trained models to advance research in embodied AI.

[3] CANVAS: Commonsense-Aware Navigation System for Intuitive Human-Robot Interaction %

INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (ICRA) 2025

Suhwan Choi†, Yongjun Cho†, Minchan Kim†, Jaeyoon Jung†, Myunchul Joe, Yubeen Park, Minseo Kim, Sungwoong Kim, Sungjae Lee, Hwiseong Park, Jiwan Chung, Youngjae Yu*

- Proposed the CANVAS framework, which integrates visual and linguistic instructions for commonsense-aware robot navigation. It leverages imitation learning to interpret abstract and noisy human guidance.
- Introduced the COMMAND dataset and demonstrated that CANVAS significantly outperforms traditional systems like ROS NavStack across both simulated and real-world environments.
- Also received the Outstanding Paper Award at the NeurIPS 2024 OWA Workshop (3 selected out of 100 accepted papers).

[4] Fine-tuning Pocket-conditioned 3D Molecule Generation via Reinforcement Learning %

ICLR 2024 WORKSHOP ON GENERATIVE AND EXPERIMENTAL PERSPECTIVES FOR BIOMOLECULAR DESIGN (GEM)

Daeseok Lee†, Yongjun Cho†

- Enhanced the 3D molecule generation model using reinforcement learning.
- Our methods are designed to broadly apply to similar models in computational drug design.

[5] Sim-to-Real Transfer of Image-Based Autonomous Guidewire Navigation Trained by Deep Deterministic Policy Gradient with Behavior Cloning for Fast Learning %

2022 IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS (IROS)

Yongjun Cho†, Jae-Hyeon Park†, Jaesoon Choi, Dong Eui Chang*

- Applied reinforcement learning to move a guidewire to its destination.
- Accelerated learning through behavior cloning in simulations.
- Constructed a real-world testbed and applied deep neural networks to real-world scenarios.

[6] Image Processing Based Autonomous Guidewire Navigation in Percutaneous Coronary Intervention %

2021 IEEE INTERNATIONAL CONFERENCE ON CONSUMER ELECTRONICS-ASIA (ICCE-ASIA)

Yongjun Cho, Jae-Hyeon Park, Jaesoon Choi, Dong Eui Chang*

- Developed an algorithm to move a guidewire to its destination in a constrained environment using only image inputs.

[7] Real-time Quadrotor Actuator Fault Detection and Isolation Using Multivariate Statistical Analysis Techniques with Sensor Measurements %

2020 20TH INTERNATIONAL CONFERENCE ON CONTROL, AUTOMATION AND SYSTEMS (ICCAS)

Jae-Hyeon Park, Yongjun Cho, Jin-Yeong Jeong, Dong Eui Chang*

- Utilized anomaly detection techniques to detect drone motor faults using sensor data.
- Built the experimental environment and performed data measurements.

Patents

[P.1] Method for Generating Molecule Based on Reinforcement Learning Model

Daeseok Lee, Yongjun Cho

Korea Patent (Filing date: 2025.01.31, Application No. 10-2025-0012347, Published: 2025.08.08, No. 10-2025-0120216)

Honors & Awards

INTERNATIONAL

2024	**Outstanding Paper Awards**, NeurIPS 2024 Workshop Open-World Agents (3 selected out of 100 accepted)	*Vancouver, Canada*

DOMESTIC

2020	**Grand Prize**, Autonomous Drone Competition hosted by the Defense Acquisition Program Administration	*Daejeon, S.Korea*

SCHOLARSHIP

2015 – 2018	**National Excellence Scholarship (Natural Sciences and Engineering)**, Covers admission fee, full tuition, and additional support for study grant and living expenses	*Korea Student Aid Foundation (KOSAF)*

Academic Services

2025	**Conference Reviewer**, 2025 IEEE International Conference on Robotics & Automation (ICRA)	*USA*
2025	**Journal Reviewer**, IEEE Robotics and Automation Letters (RA-L)	*USA*

Extracurricular Activity

AttentionX: AI Research & Startup Group *Seoul*

TEAM MEMBER *Jan. 2024 - Dec. 2024*

- Conducted comprehensive analysis on 3D and 4D generative models, exploring their applications.
- Researched tuning-free high-resolution image editing techniques utilizing pretrained diffusion models.

NUS (National University of Singapore) *Singapore*

EXCHANGE STUDENT *Jan. 2018 - May. 2018*

- Adapted to a multicultural academic environment and improved cross-cultural communication skills.
- Completed courses in mechanical engineering, environmental science, and Chinese language as part of the exchange program.

Certifications

2025	**NVIDIA Isaac for Accelerated Robotics**, Instructor Led Workshop, Nvidia Deep Learning Institute
2025	**Generative AI with Diffusion Models**, Self-paced Course, Nvidia Deep Learning Institute

Skills

ML Framework	Pytorch, Lightning, Ray, Nvidia Isaac
Programming	Python, Docker, ROS, OpenCV, Java, Android, C++, LaTeX, MySQL, FastAPI, Next.js
Languages	Korean (native), English (fluent; TOEFL iBT 106)