# Chanyoung **Ahn**

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Researcher, Center for Humanoid Research, Korea Institute of Science and Technology (KIST), Seoul, South Korea

# **Research Interest**

My research focuses on developing robust dexterous manipulation strategies by leveraging haptic feedback, particularly in unstructured and contact-rich environments.

# **Current research interests include:**

- Tactile-driven in-hand manipulation for asymmetric and dynamic objects
- State representation learning from latent physical properties (e.g., stiffness, mass distribution)
- Deformable object manipulation with visuo-haptic perception

# **EDUCATION**

# • M.S. in Robotics, Korea Advanced Institute of Science and Technology (KAIST) Thesis title: A Reinforcement Learning Testbed for Deformable Object Manipulation using Visuotactile Sensing

• Advisor: Daehyung Park | Lab: RIRO Lab

· GPA: 3.26/4.30

# B.S. in Mechanical Engineering, Pusan National University (PNU)

Thesis: Structural Design and Verification of Weight Reduction for 12U Cube Satellite

• Advisor: Haedo Jeong

• GPA: 4.16/4.50 | Summa Cum Laude

# **Research Experience**

#### Korea Institute of Science and Technology (KIST), Prime Lab[<sup>(\*)</sup>] Nov 2024 - Present Researcher, KIST the Center of Humanoid Research, Prime Lab, advised by Dr. Donghyun Hwang Seoul, South Korea · Developed a reinforcement learning policy for in-hand object rotation using haptic feedback in Isaac Sim, targeting objects with eccentric center of mass (Submitted lead-author work to IROS 2025; accepted to

ICRA 2025 Workshop [])

- Designed a learning platform for object property inference and manipulation planning using a dexterous robotic hand in a national project on tactile intelligence for 3+ haptic sensing and two robotic hands
- Led system design and implementation of a tangible robotic display integrating Korean mask aesthetics and magnetic jamming, showcased at ICRA 2025 Arts in Robotics []

# Korea Institute of Science and Technology Information (KISTI) [ Apr 2024 - Jul 2024 Research Intern, Supercomputing Applications Center, advised by Dr. Jihoon Kang Daejeon, South Korea Developed a benchmarking module for sparse matrix parallelization using MPI with C/Fortran; accepted to the 2024 Society for Computational Design and Engineering (CDE) [] • Contributed to the development and documentation of the open-source repository PaScaL\_TDMA for scalable HPC applications [🔗] • Led a GitHub workshop for 8+ researchers, improving repository collaboration and version control practices across the team [**9**] • NARA Space Inc. [🏶] Aug 2019 - Dec 2020 Summer Research Intern + Academic Collaboration (Pusan National University) Busan, South Korea • Led a structural design project for a 12U Cube Satellite as team leader in collaboration with NARA Space Inc. and Pusan National University [] • Reduced satellite structural mass by 34% while meeting ISILaunch environmental standards, verified through ANSYS simulation (FEA, Transient, and Thermal) [8] · Coordinated team workflow, managed industry communication, and delivered CAD prototypes using CREO and Fusion 360

 Awarded 3rd place (top 3 out of 90 teams) at the Undergraduate Research Poster Session at Pusan National University

Mar 2016 - Aug 2021 Busan, South Korea

Sept 2021 - Feb 2024

Daejeon, South Korea

- Undergraduate Research Intern, advised by Prof. Kyungchun Kim
   Busan, South Korea

   Designed a low-noise airfoil inspired by owl wing morphology (e.g., leading-edge serrations), targeting aeroacoustic performance improvements
- Led wind tunnel experiment setup and analysis using PIVlab (MATLAB), Tecplot, and ANSYS Fluent
- Awarded Silver Prize (Top 3 nationally) at the 11th National Undergraduate Fluid Engineering Competition, hosted by KSME

# PROJECTS

Pusan National University, ExTensys Lab []

- **RL-based Manipulation of Deformable Objects for Semiconductor Automation** May 2022 Feb 2024 Tools: Isaac Sim (Omniverse), ROS, Linux, vision & tactile sensors
  - Led a Samsung DS-funded project to develop a reinforcement learning framework for manipulating O-ring-type deformable objects in automated semiconductor equipment
  - Designed and implemented visuotactile simulation environments using Isaac Sim and real sensor data to enable Sim2Real transfer
- Built a data collection pipeline using a wearable force-sensing glove for contact-rich deformable interaction (output accepted at KAIA 2022, patent filed)
- Coordinated communication between academic and industry teams, and supervised project direction as team lead
- Goal-Conditioned RL for Multi-Contact Manipulation of Deformable Objects Apr 2022 Feb 2024 Tools: Isaac Sim, Linux, vision & tactile sensors
  - Built RL environments for multi-material, ring-shaped deformable object manipulation using visuotactile feedback
  - Developed simulation frameworks integrating contact-rich sensing for goal-directed object shaping and placement
  - Contributed to a national IITP research project on dexterous robotic manipulation of everyday items under physical constraints

# **PUBLICATIONS**

C=Conference, J=Journal, P=Patent, U=Under review, T=Thesis, W=Workshop

- [W.1] Chanyoung Ahn, Sungwoo Park, and Donghyung Hwang (2025). Effectiveness of Kinesthetic Sensing in In-Hand Rotation of Objects with an Eccentric Center of Mass. In ICRA Workshop Handy Moves: Dexterity in Multi-Fingered Hands.
- [U.1] Chanyoung Ahn, Sungwoo Park, and Donghyung Hwang (2025). Feasibility Study on the Validity of Kinesthetic Data in the In-Hand Rotation of Objects with an Eccentric Center of Mass. *Under review.*
- [P.1] Bonggyeong Park, Chanyoung Ahn, and Daehyung Park (2023). Data Collection Framework for Deformable Object Manipulation using Virtual Reality. *Korean Patent Application No.* 10-2023-0092999, filed July 18, 2023.
- [C.1] Bonggyeong Park, Chanyoung Ahn, and Daehyung Park (2022). A Telemanipulation Suite for Deformable Object Manipulation. In *korean Artificial Intelligence Association (KAIA)*, South Korea.

# SKILLS

- **Programming Languages:** Python (PyTorch), C/C++, MATLAB, LaTeX
- Simulation & Robotics Tools: Isaac Sim, Isaac Gym, PyBullet, ROS, UR5e, RBQ-3 (Rainbow Robotics), Spot (Boston Dynamics)
- Software Tools: Linux/Ubuntu, Git, GitHub, Blender, Ansys (Fluent, Transient), 3D printer, laser cutter
- CAD Tools: CREO, Fusion, Blender
- Libraries & Frameworks: PyTorch, RL libraries (Skrl, Stable-Baselines), Matplotlib

# MEMBERSHIP & COMMUNITY SERVICE

- **Remonde**, Robotics Researcher Community Organizer
- PNU Yeonhak, Engineering Academic Club Member
- PNU Mechatronics, Robot Academic Club Member

ACADEMIC SERVICE

• IEEE/RSJ Interantional Conference on Intelligent Robots and Systems (IROS) , (Reviewer)

# ADDITIONAL INFORMATION

April 2025 - Present April 2017 - June 2021 April 2016 - June 2021