

Hochul Hwang

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hchlhwang.github.io

[Google Scholar](#)

EDUCATION

M.S./Ph.D	Computer Science, University of Massachusetts Amherst, MA, United States	2021–
B.S.	Robot Engineering, Hanyang University ERICA, Ansan, Republic of Korea	2013–2019

RESEARCH AREAS

Visual Navigation, Human-Robot Interaction, Assistive Robotics

PUBLICATIONS

Conference

- 2024 [Is it safe to cross? Interpretable Risk Assessment with GPT-4V for Safety-Aware Street Crossing](#)
H. Hwang, S. Kwon, Y. Kim, and D. Kim
UR 2024 (Finalist)
- 2024 [Towards Robotic Companions: Understanding Handler-Guide Dog Interactions for Informed Guide Dog Robot Design](#)
H. Hwang, H.T. Jung, N.A. Giudice, J. Biswas, S.I. Lee*, and D. Kim*
CHI 2024 (Best Paper Award)
- 2023 [System Configuration and Navigation of a Guide Dog Robot: Toward Animal Guide Dog-Level Guiding Work](#)
H. Hwang[†], T. Xia[†], I. Keita, K. Suzuki, J. Biswas, S.I. Lee*, and D. Kim*
ICRA 2023
- 2018 [Control Scheme and Uncertainty Considerations for Dynamic Balancing of Passive-Ankled Biped and Full Humanoids](#)
D. Kim, S.J. Jorgensen, H. Hwang, and L. Sentis
Humanoids 2018
- 2018 [Computationally-Robust and Efficient Prioritized Whole-Body Controller with Contact Constraints](#)
D. Kim, J. Lee, O. Campbell, H. Hwang, and L. Sentis
IROS 2018

Journal

- 2021 [ElderSim: A Synthetic Data Generation Platform for Human Action Recognition in Eldercare Applications](#)
H. Hwang, C. Jang, G. Park, J. Cho, and I.J. Kim
IEEE Access 2021.
- 2021 [Highly Sensitive Capacitive Pressure Sensors over a Wide Pressure Range Enabled by the Hybrid Responses of a Highly Porous Nanocomposite](#)
K.H. Ha, W. Zhang, H. Jang, S. Kang, L. Wang, P. Tan, H. Hwang, and N. Lu
Advanced Materials 2021.

Preprint

- 2024 [Lessons Learned from Developing a Human-Centered Guide Dog Robot for Mobility Assistance](#)
H. Hwang, K. Suzuki, N.A. Giudice, J. Biswas, S.I. Lee, and D. Kim
[arXiv](#).
- 2024 [Synthetic data augmentation for robotic mobility aids to support blind and low vision people](#)
H. Hwang, K. Adhikari, S. Shodhaka, and D. Kim
[arXiv](#).

Workshop

- 2023 [Dynamic Object Avoidance using Event-Data for a Quadruped Robot](#)
S. Zhu, N. Perara, S. Yu, H. Hwang, and D. Kim
IROS IPPC workshop 2023.

Patent

- 2024 [Human behavior recognition system and method using hierarchical class learning considering safety](#)
J. Cho, I. J. Kim, and H. Hwang
U.S. Patent Application (17/565,453)

RESEARCH EXPERIENCE

- 2021– **Graduate Research Assistant, DARoS Lab @ UMass Amherst**
User-centered guide dog robot development for blind and low-vision individuals: Foundation model-based perception and planning in legged systems for safe and efficient navigation.
- 2019–2020 **Research Intern, Center for AI @ Korea Institute of Science and Technology**
Real-time human action recognition system development and synthetic data augmentation evaluation.
- 2017–2018 **Undergraduate researcher, Human Centered Robotics Lab @ UT Austin**
Testing and optimizing the 6 DOF passive-ankled biped robot, Mercury, for walking.
- 2018 **Undergraduate Researcher, Lu Research Group @ UT Austin**
Manufacturing and testing flexible resistive force sensors for lower-limb prosthetic stress distribution.

AWARDS & SCHOLARSHIP

Awards & Honors

- 2024 Best Paper Finalist - International Conference on Ubiquitous Robots 2024
- 2024 Best Paper Award - ACM SIGCHI Conference on Human Factors in Computing Systems 2024
- 2023 Vision Assistance Race 2nd place - CYBATHLON Challenges 2023
- 2017 Creative Technology and Excellence Award - STEAM CUP

Scholarship & Fellowships

- 2024 Robert and Deanna Hagerty Robotics Scholarship
- 2021 UMass Amherst CICS Jumpstart Fellowship
- 2016-2017 {Hanyang University, Haksan Foundation} Academic Achievement Scholarship

Media

[IEEE Spectrum Video Friday](#) (2024), [UMass Amherst](#) (2024), [Westside News](#) (2022)

TEACHING EXPERIENCE

Teaching Assistant @ UMass Amherst

Fall 2024 Reasoning Under Uncertainty (COMPSCI 240) – teach discussion sessions

Spring 2023 Robotics (COMPSCI 603) – [mobile robot platform setup](#)

Fall 2022 Introduction to Robotics - Mechanics, Dynamics, and Control (COMPSCI 403) – [interactive quiz](#)

Student Mentor @ UMass Amherst

Early Research Scholars Program – [Shiven Patel](#), Antoinette Reid, Ron Kleinhouse-Goldman, [Dang Nguyen](#)

Honors thesis – [Krisha Adhikari](#) (synthetic data), [Matthew Hersey](#) (deep learning)

Research & independent study – [Shiven Patel](#) (audio tracking - ACM TAPIA Competition'24 1st Place),
[Tim Xia](#) (path planning), [Ken Suzuki](#) (CAD), [Millan Taranto](#) (CAD)

ACADEMIC SERVICE

Reviewer – **ACI'24, Humanoids'24, RA-L'24, CHI'24, IROS'23, ICRA'22**

UMass Korean Graduate Student Association (KGSA) President 2022-2023

TECHNICAL & RESEARCH SKILLS

Programming & software: Python, C++, MATLAB, PyTorch, TensorFlow, ROS, Unreal Engine, Docker, Git
Mechatronics: SOLIDWORKS (Certified SolidWorks Associate), CATIA, Onshape

Updated October 2024