Hochul Hwang

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Google Scholar

Education

University of Massachusetts Amherst 2021 – Current
M.S. & Ph.D. in Computer Science
Advisor: Dr. Donghyun Kim
Research Focus: Visual Navigation, Human-Robot Interaction, Assistive Robotics

Hanyang University ERICA 2013 – 2019
B.S. in Robot Engineering (Cum Laude)

Honors and Awards

- **Best Paper Finalist**, International Conference on Ubiquitous Robots (UR) 2024
- **Best Paper Award**, ACM SIGCHI Conference on Human Factors in Computing Systems (CHI) 2024
- **Robert and Deanna Hagerty Robotics Scholarship**, UMass Amherst 2024
- **Vision Assistance Race 2nd place**, CYBATHLON Challenges 2023 2023
- **UMass Amherst CICS Jumpstart Fellowship**, UMass Amherst 2021
- **Academic Achievement Scholarship**, Hanyang University, Haksan Foundation 2016 – 17

Publications

Conference

1. **Visual Navigation & HRI work**
   Under review 2025
   H. Hwang et al.

2. **Perception & Simulation work**
   Under review 2025
   H. Hwang et al.

3. **Human-Centered Development of Guide Dog Robots: Quiet and Stable Locomotion Control**
   arXiv 2025
   S. Yu†, H. Hwang†, T.M. Dang, J. Biswas, N.A. Giudice, S.I. Lee, D. Kim

4. **Synthetic data augmentation for robotic mobility aids to support blind and low vision people**
   International Conference on Robot Intelligence Technology and Applications (RiTA) 2024
   H. Hwang, K. Adhikari, S. Shodhaka, and D. Kim

5. **Is it safe to cross? Interpretable Risk Assessment with GPT-4V for Safety-Aware Street Crossing**
   International Conference on Ubiquitous Robots (UR) 2024 **(Finalist, Top 8)**
   H. Hwang, S. Kwon, Y. Kim, and D. Kim

6. **Towards Robotic Companions: Understanding Handler-Guide Dog Interactions for Informed Guide Dog Robot Design**
   ACM Conference on Human Factors in Computing Systems (CHI) 2024 **(Best Paper Award, $< 1\%$)**
   H. Hwang, H.T. Jung, N.A. Giudice, J. Biswas, S.I. Lee*, and D. Kim*

7. **System Configuration and Navigation of a Guide Dog Robot: Toward Animal Guide Dog-Level Guiding Work**
   IEEE International Conference on Robotics and Automation (ICRA) 2023
   H. Hwang†, T. Xia†, I. Keita, K. Suzuki, J. Biswas, S.I. Lee*, and D. Kim*

8. **Control Scheme and Uncertainty Considerations for Dynamic Balancing of Passive-Ankled Bipeds and Full Humanoids**
   IEEE-RAS International Conference on Humanoid Robots (Humanoids) 2018
   D. Kim, S.J. Jorgensen, H. Hwang, and L. Sentis

9. **Computationally-Robust and Efficient Prioritized Whole-Body Controller with Contact Constraints**
   IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2018
   D. Kim, J. Lee, O. Campbell, H. Hwang, and L. Sentis

Journal

1. **ElderSim: A Synthetic Data Generation Platform for Human Action Recognition in Eldercare Applications**
   IEEE Access 2021
   H. Hwang, C. Jang, G. Park, J. Cho, and I.J. Kim

2. **Sensitive Capacitive Pressure Sensors over a Wide Pressure Range Enabled by the Hybrid Responses of a Highly Porous Nanocomposite**
   Advanced Materials 2021
   K.H. Ha, W. Zhang, H. Jang, S. Kang, L. Wang, P. Tan, H. Hwang, and N. Lu

Workshop

1. **AVA in Action: Developing a Guide Dog Robot for Blind and Low-Vision People**
   CVPR AVA 2025
   H. Hwang, K. Adhikari, P. Goel, A. Nguyen, S. Shodhaka, S. Yu, T. M. Dang, K. Suzuki, G. Chebly, P. White, J. Biswas, N.A. Giudice, S.I. Lee, D. Kim

2. **Lessons Learned from Developing a Human-Centered Guide Dog Robot for Mobility Assistance**
   ASSETS UrbanAccess 2024
   H. Hwang, K. Suzuki, N.A. Giudice, J. Biswas, S.I. Lee, and D. Kim

3. **Dynamic Object Avoidance using Event-Data for a Quadruped Robot**
   IROS IPPC 2023
   S. Zhu, N. Perara, S. Yu, H. Hwang, and D. Kim

Research Experience

University of Massachusetts Amherst, Dynamic & Autonomous Robotics Lab 2021 – Current
Graduate Research Assistant

- 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.
- VLM evaluation for safe street crossing and synthetic data augmentation for perception model training.

University of Texas at Austin, Human Centered Robotics Lab 2017 – 2018
Undergraduate Research Assistant

- Testing and optimizing the 6 DOF passive-ankled biped robot, Mercury, for walking.

University of Texas at Austin, Lu Research Group 2018
Undergraduate Research Assistant

- Manufacturing and testing flexible resistive force sensors for lower-limb prosthetic stress distribution.

Work Experience

Glidance, Seattle, USA 2025 – Current
Perception and Planning Intern

- Developing robust vision-based visual teach-and-repeat navigation for the Glide robot.

Korea Institute of Science and Technology – Center for AI, Republic of Korea 2019 – 2020
Research Intern

- Real-time human action recognition system development and synthetic data augmentation evaluation.

Teaching Experience

Teaching Assistant @ UMass Amherst

- Reasoning Under Uncertainty (COMPSCI 240) – teach discussion sessions Fall 2024
- Robotics (COMPSCI 603) – mobile robot platform setup Spring 2023
- Intro. to Robotics: Mechanics, Dynamics, & Control (COMPSCI 403) – interactive quiz Fall 2022

Advising Experience

Early Research Scholars Program

- Keshav Garg, Dylan Gage, Anshu Anjna, Duretti Hordofaa 2025 – 2026
- David Makarovsky, Anh Nguyen, Mena Ibeku, Ahaana Chabba 2024 – 2025
- Shiven Patel, Antoinette Reid, Ron Kleinhause-Goldman, Dang Nguyen (National Conf.) 2023 – 2024

Honors Thesis

- Krisha Adhikari (synthetic data), Matthew Hersey (deep learning)

Research & Independent Study

- Soowan Yang (perception), David Makarovsky (navigation), Anh Nguyen (synthetic data), Parth Goel (perception), Shiven Patel (audio tracking - ACM TAPIA Competition'24 **1st Place**), Tim Xia (path planning), Ken Suzuki (CAD), Millan Taranto (CAD)

Press Coverage

- **Guide Dog Robot Development: Quiet and Stable Locomotion Control** May 2025
  IEEE Spectrum Video Friday
- **Towards Robotic Companions: Understanding Handler-Guide Dog Interactions** May 2024
  IEEE Spectrum Video Friday, UMass Amherst, Westside News

Service

Peer Review

- *Robotics* – ICRA'26, RA-L'25, UR'25, RiTA'24, Humanoids'24, RA-L'24, IROS'23, ICRA'22
- *Human-Robot Interaction* – HRI'26, ACI'24, CHI'24

Lecture & Autonomous robot demonstration

- Autonomous Guiding demo @ Fidelco Guide Dog Foundation Inc. (8.12.25)
- Robotics Workshop (Navigation & LeRobot VLA demo) @ Massenberg STEM Institute (7.29.25, 8.7.25)

Robot demonstration

- Walk for Independence @ The Carroll Center for the Blind (5.31.25)
- Springfield High School of Science and Technology (5.28.25)

- Research for Inherited Retinal Diseases @ Foundation Fighting Blindness X UMass (10.19.24)
- Research @ Fidelco Guide Dog Foundation Inc. (5.5.22)

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