

# HOCHUL HWANG

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## 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)*

*Exchange Student: The University of Texas at Austin, Dept. of ECE* 2017 – 2018

## 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
- **UMass Amherst CICS Jumpstart Fellowship**, UMass Amherst 2021
- **Academic Achievement Scholarship**, Hanyang University, Haksan Foundation 2016 – 17

## PUBLICATIONS

### Conference

1. **GuideTWSI: A Diverse Tactile Walking Surface Indicator Dataset from Synthetic and Real-World Images for Blind and Low-Vision Navigation**  
*IEEE International Conference on Robotics and Automation (ICRA) 2026*  
H. Hwang, S. Yang, A. N.H. Nguyen, P. Goel, K. Adhikari, S.I. Lee, J. Biswas, N.A. Giudice, D. Kim
2. **Human-Centered Development of Guide Dog Robots: Quiet and Stable Locomotion Control**  
*IEEE International Conference on Robotics and Automation (ICRA) 2026*  
S. Yu<sup>†</sup>, H. Hwang<sup>†</sup>, T.M. Dang, J. Biswas, N.A. Giudice, S.I. Lee, D. Kim
3. **GuideNav: User-Informed Development of a Vision-Only Robotic Navigation Assistant For Blind Travelers**  
*ACM/IEEE International Conference on Human-Robot Interaction (HRI) 2026*  
H. Hwang, S. Yang, J.S. Monon, N.A. Giudice, S.I. Lee, J. Biswas, 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<sup>†</sup>, T. Xia<sup>†</sup>, I. Keita, K. Suzuki, J. Biswas, S.I. Lee\*, and D. Kim\*

**8. Control Scheme and Uncertainty Considerations for Dynamic Balancing of Passive-Ankled Biped 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

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**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.

- The 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.
- The 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

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- Glidance**, Seattle, USA 2025 – Current  
*Robotics & ML 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

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- 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

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- 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 Kleinhouse-Goldman, **Dang Nguyen (National Conf.)** 2023 – 2024

## Honors Thesis

- **Krishna 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

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- **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

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### Peer Review

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