Hochul Hwang

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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

Robotics, Human-Robot Interaction, Computer Vision

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.

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

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 Bipeds 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.

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

2022 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: implementing learning algorithms for 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.

2018 **Undergraduate Researcher, Lu Research Group @ UT Austin**
Manufacturing and testing flexible resistive force sensors for lower-limb prosthetic stress distribution.

AWARDS & SCHOLARSHIP

Awards and Honors

2023 CYBATHLON Challenges 2023 - Vision Assistance Race 2nd place

2017 STEAM CUP - Creative Technology and Excellence Award

Scholarship & Fellowships

2021 University of Massachusetts Amherst CICS Jumpstart Fellowship

2016-2017 {Hanyang University, Haksan Foundation} Academic Achievement Scholarship

TEACHING EXPERIENCE

Teaching Assistant @ UMass Amherst

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

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

Research & independent study – Tim Xia (path planning), Ken Suzuki (CAD), Millan Taranto (CAD)

ACADEMIC SERVICE

Reviewer – **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 April 2024