Hee Jae Kim

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RESEARCH INTERESTS

Computer Vision, Machine Learning, and Robotics
- Human-machine interaction, Autonomous and assistive technologies

EDUCATION

Boston University Boston, MA, USA

Ph.D., Department of Electrical and Computer Engineering Sep. 2022 –
Advisor: Eshed Ohn-Bar

Ewha Womans University Seoul, South Korea

M.S., Department of Electronic and Electrical Engineering Mar. 2019 – Feb. 2021
Advisors: Byung-Uk Lee , Je-Won Kang

B.S. in Engineering, Department of Electronics Engineering Mar. 2014 – Feb. 2019

PEER-REVIEWED PUBLICATIONS

[1] **Hee Jae Kim**, Kathakoli Sengupta, Masaki Kuribayashi, Hernisa Kaccori, Eshed Ohn-Bar. Text to Blind Motion. *NeurIPS*, 2024. [pdf] [project]

[2] **Hee Jae Kim**, Kathakoli Sengupta, Masaki Kuribayashi, Hernisa Kaccori, Eshed Ohn-Bar. A Multi-Modal Dataset for Urban Navigation by Blind Individuals. *UrbanAccess Workshop*, 2024. [pdf]

[3] **Hee Jae Kim**, and Eshed Ohn-Bar, Motion Diversification Networks, *CVPR*, 2024. [pdf] [project]

[4] **Hee Jae Kim**, and Eshed Ohn-Bar, Motion Diversification Networks, *Women in Computer Vision (WiCV) Workshop*, 2024.

[5] Doyi Kim, **Hee Jae Kim**, and Yong-Sang Choi, Unsupervised Clustering of Geostationary Satellite Cloud Properties for Estimating Precipitation Probabilities of Tropical Convective Clouds, *JAMC*, 2023. [pdf]

[6] Gyu-Lee Jeon, **Hee Jae Kim**, Eun Yeo, and Je-Won Kang, CNN Based Multi-View Image Quality Enhancement, *ICFUN*, 2022. [pdf]

[7] **Hee Jae Kim**, Je-Won Kang, and Byung-Uk Lee, 360° Image Reference-Based Super-Resolution Using Latitude-Aware Convolution Learned from Synthetic to Real, *IEEE Access*, 2021. [pdf] [code] [project]

[8] **Hee Jae Kim**, Je-Won Kang, and Byung-Uk Lee, Super-resolution of Multi-view ERP 360-Degree Images with Two-Stage Disparity Refinement, *APSIPA*, 2020. [pdf]

RESEARCH PROJECTS

Realistic Driving Simulation in a 3D Reconstructed World
Boston University Sep. 2023 –
- Developed a novel rendered-based human-in-the-loop simulation framework for a scalable collection of diverse and realistic driving demonstrations
- Facilitated scalable collection of multimodal driving trajectories and evaluated AV planners, revealing limitations of unimodal metrics and the need for robust metrics capturing real-world driving complexity.

3D Human Motion Generation and Behavior Modeling for Accessibility
Boston University Sep. 2022 –
- Developed a novel framework for learning to generate realistic and diverse 3D human motion in dynamic real-world settings

- Introduced *BlindWays*, the first multimodal text-to-motion dataset for blind pedestrians, and benchmarked state-of-the-art 3D human motion generation models on unique disability-related scenarios and behaviors

Super-Resolution of Multi-View 360-Degree Imagery
Ewha Womans University Mar. 2019 – Feb. 2021

- Developed a reference-based super-resolution network and adaptive disparity estimator for 360-degree images in unstructured multi-camera systems

Quality Enhancement of Blurry and Saturated Endoscopic Images
Full-Time Undergraduate Researcher, Ewha Womans University Oct. 2018 – Feb. 2019

- Developed a saturation-compensated Richardson-Lucy's deconvolution algorithm to reduce artifacts during endoscopic image restoration

WORK EXPERIENCE

RainbirdGEO Seoul, South Korea
Full-Time Researcher Jul. 2021 – Feb. 2022

- Developed a machine learning framework to cluster geostationary satellite cloud properties and estimate precipitation probabilities of tropical convective clouds
- Keywords: *instance/semantic segmentation, self-organizing map*

ETRI Daejeon, South Korea
Full-Time Undergraduate Researcher, AI Research Laboratory Jun. 2018 – Aug. 2018

- Researched real-time object detection algorithms for autonomous driving
- Member of the Autonomous Driving System Research Group in the Intelligent Robotics Research Division
- Keywords: *autonomous driving, real-time object detection*

HONORS AND AWARDS

Doctoral Research Fellowship | Boston University 2023-2024
Distinguished Electrical Engineering Fellowship | Boston University 2022-2023
Research Grant for Outstanding Female Engineering Research Team | WISET 2020
Student Assistant Scholarship | Ewha Womans University 2019-2020
Dean's List | Ewha Womans University 2017-2018

TEACHING

Boston University 2024

- Robot Learning (EC518), Smart and Connected Systems (EC444)

Ewha Womans University 2019 – 2020

- Digital Image Processing (36515-01), Signals and Systems (30272-01), Circuit Theory (34298-01)

Service

CVPR2024 AVA Accessibility Vision and Autonomy Challenge 2024

- Challenge Organizer

PATENTS

[1] **Hee Jae Kim**, Je-Won Kang, Jin Heo, Seung Wook Park, Method for Camera Parameter Grouping and Updating for MPEG Immersive Video, Korea Patent Application, filed on April 05, 2023 (Application no.10-2023-0044499).

[2] **Hee Jae Kim**, Je-Won Kang, and Byung-Uk Lee, Super-Resolution Method and Image Processing Apparatus for Equirectangular Projection Format 360-Degree Image, Korea Patent Application, filed on December 31, 2020 (Application no.10-2020-0188790), issued on September 7, 2022 (Patent no. 10-2442980).

[3] **Hee Jae Kim**, Je-Won Kang, and Byung-Uk Lee, Super-Resolution Method for Multi-view 360-Degree Image and Image Processing Apparatus, Korea Patent Application, filed on July 29, 2019 (Application no.10-2019-0162738), issued on December 9, 2019 (Patent no. 10-2141319).