Hee Jae Kim

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RESEARCH INTERESTS

Computer Vision, Robotics, and Machine Learning
- Autonomous and assistive systems

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

RESEARCH PROJECTS

Realistic Driving Simulation in a 3D Reconstructed World
Boston University Sep. 2023 –
- Developed a rendered-based simulation for a scalable collection of diverse and realistic driving demonstrations

Human Motion Generation and Behavior Modeling for Accessibility
Boston University Sep. 2022 –
- Developed a fine-grained pose estimation and prediction model with simulation-to-real techniques and physics-based regularization
- Validated the model using real-world motion capture study with individual with visual impairment

Core Technologies for Simulated Reality Contents
Ewha Womans University Jul. 2020 – Feb. 2021
- Developed a reference-based super-resolution network and adaptive disparity estimator for 360-degree images in unstructured multi-camera systems
- Constructed a computer-synthetic, multi-view, 360-degree video dataset

Compression and Transmission Technologies for Ultra-High-Quality Immersive Videos Supporting 6DoF
Ewha Womans University Mar. 2019 – Feb. 2021
- Developed a image and video restoration network for 6DoF videos, such as light-field and multi-view 360-degree videos

Quality Enhancement of Blurry and Saturated Endoscopic Images
Full-Time Undergraduate Researcher, Ewha Womans University Oct. 2018 – Feb. 2019
- Led the development of a saturation-compensated Richardson-Lucy's deconvolution algorithm to reduce artifacts during endoscopic image restoration

PEER-REVIEWED PUBLICATIONS

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

[2] 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]

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

[4] **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]

[5] **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]

[6] **Hee Jae Kim**, Je-Won Kang, and Byung-Uk Lee, CNN-based Multi-view 360-Degree Video Super-resolution, *IPIU*, 2020.

[7] **Hee Jae Kim** and Byung-Uk Lee, Comparison of Saturated Image Restoration Methods, *IPIU*, 2019.

WORK EXPERIENCE

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

- Unsupervised Clustering of Geostationary Satellite Cloud Properties or Estimating Precipitation Probabilities of Tropical Convective Clouds
- Keywords: *instance/semantic segmentation, self-organizing map*

Electronics and Telecommunications Research Institute (ETRI) Daejeon, South Korea
Full-Time Undergraduate Researcher, AI Research Laboratory Jun. 2018 – Aug. 2018

- Member of the Autonomous Driving System Research Group in the Intelligent Robotics Research Division
- Real-time object detection algorithm (YOLOv3) for autonomous driving
- Keywords: *autonomous driving, real-time object detection*

HONORS AND AWARDS

Research Grant of $7,000 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

- Smart and Connected Systems (EC444)

Ewha Womans University 2019 – 2020

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

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).