Yewon Hwang

AI Researcher

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PROFILE

AI researcher with experience in intelligent systems built on multimodal data and large-scale AI models. My research spans dynamic scene understanding, multi-object detection and tracking, sentiment analysis, task planning. I have end-to-end experience across the AI development lifecycle, including dataset construction and analysis, model design and training, performance validation, and system integration. Recognized with first place in the SoccerNet Challenge 2025 and the WACV 2026 Best Paper award for research addressing complex real-world AI problems.

RESEARCH EXPERIENCE

Postdoctoral Researcher

Sep 2024–Present

Korea Institute of Science and Technology (KIST)

Vision-Based AI for Dynamic Scene Understanding

- Developed an end-to-end vision system for multi-object localization, tracking, and identity attribute recognition in dynamic scenes
- Designed multi-object tracking and tracklet refinement algorithms integrating appearance, spatial, and identity cues for robust long-term tracking
- Finetuned vision-language models (VLMs) for object recognition and identity attribute classification
- Co-developed homography estimation and geometric mapping methods to project video observations onto structured coordinate representations (e.g., pitch maps)

End-to-End AI System Development from Raw Data

- Collected large-scale video datasets, designed annotation protocols, and co-developed data annotation and visualization tools
- Conducted data-centric AI development, including data preprocessing, quality control, and systematic noise and error analysis
- Designed ablation studies and iterative validation pipelines to identify performance bottlenecks and improve model robustness

Multimodal AI for Healthcare

- Developed multimodal fusion architectures integrating IMU sensor signals and vision-based pose representations
- Improved model reliability and interpretability through feature-level and modality-level analysis and fusion

Doctoral Researcher

Feb 2021–Aug 2024

Korea Advanced Institute of Science and Technology (KAIST)

Multimodal Affective Understanding

- Developed multimodal representation learning models integrating text, audio, and visual modalities for emotion and sentiment understanding
- Designed cross-modal alignment and fusion architectures to capture complementary relationships across heterogeneous modalities
- Developed robust multimodal learning methods to mitigate modality noise and learn from incomplete supervision
- Developed domain-generalizable multimodal learning methods to improve cross-dataset generalization under distribution shifts
- Designed cross-dataset joint training with soft pseudo-labeling to leverage datasets with heterogeneous emotion and sentiment annotations

LLM-Based Task Planning

- Developed an LLM-based task planning framework that translates natural-language instructions into executable action sequences through surgical prompt-tuning

Master's Researcher

Feb 2019–Feb 2021

Korea Advanced Institute of Science and Technology (KAIST)

Human–Computer Interaction

- Developed vision-based contactless text input systems using finger-motion recognition and sequence modeling
- Designed coordinate-based text input models for invisible mobile keyboard interfaces

Vision-Based Industrial Defect Classification

- Developed CNN-based multi-label classification models for automated industrial defect recognition
- Designed resolution-robust architectures for variable-sized input images using multi-scale feature extraction and spatial pooling

EDUCATION

Ph.D. in Electrical Engineering

Feb 2021–Aug 2024

Korea Advanced Institute of Science and Technology (KAIST)

M.S. in Electrical Engineering

Feb 2019–Feb 2021

Korea Advanced Institute of Science and Technology (KAIST)

B.S. in Mechanical Engineering

Aug 2014–May 2018

Pennsylvania State University, University Park

TECHNICAL SKILLS

AI / ML: Multimodal Learning, Vision-Language Models (VLMs), LLM-Based Reasoning, Multi-Object Tracking (MOT), Temporal Modeling

Programming & frameworks: Python, PyTorch

AWARDS

- **Best Paper Award (Application Track)** — WACV 2026
- **1st Place, Game State Reconstruction (GSR)** — SoccerNet Challenge 2025
- **Google Travel Grant** — WACV 2024
- **Best of the Year, Senior Capstone Project** — *Pressure-Sensing Orthotic Brace for Pectus Carinatum*

PUBLICATIONS

* Equal contribution.

[1] Broadcast2Pitch++: Depth-Aware Game State Reconstruction from Unconstrained Soccer Videos

Yewon Hwang, Yin May Oo*, Muhammad Amrulloh Robbani*, Vanyi Chao, Ankhzaya Jamsrandorj, Hoang Quoc Nguyen, Kyung-Ryoul Mun, Jinwook Kim.

Machine Vision and Applications, 2026. PDF

[2] Broadcast2Pitch: Game State Reconstruction from Unconstrained Soccer Videos

Yin May Oo*, **Yewon Hwang***, Muhammad Amrulloh Robbani, Vanyi Chao, Ankhzaya Jamsrandorj, Hoang Quoc Nguyen, Kyung-Ryoul Mun, Jinwook Kim.

WACV, 2026. PDF

[3] Spatiotemporal Event Spotting via 3D Heatmaps with Dynamically Shifted Gaussian Kernels

Ankhzaya Jamsrandorj*, Vanyi Chao*, Hoang Quoc Nguyen, Yin May Oo, Muhammad Amrulloh Robbani, **Yewon Hwang**, Kyung-Ryoul Mun, Jinwook Kim.

BMVC, 2025. PDF

[4] Jump-Aware: Player Position Rectification and Identification in Dynamic Sports Using Jump Event Spotting

Yin May Oo, Ankhzaya Jamsrandorj, Vanyi Chao, Hoang Quoc Nguyen, **Yewon Hwang**, Kyung-Ryoul Mun, Jinwook Kim.

CVPR · CVsports Workshop, 2025. PDF

[5] EASUM: Enhancing Affective State Understanding through Joint Sentiment and Emotion Modeling for Multimodal Tasks

Yewon Hwang, Jong-Hwan Kim.

WACV, 2024. PDF

[6] Self-Supervised Unimodal Label Generation Strategy Using Recalibrated Modality Representations for Multimodal Sentiment Analysis

Yewon Hwang, Jong-Hwan Kim.

Findings of EACL, 2023. PDF

[7] Deep Q-Network for AI Soccer

Curie Kim*, **Yewon Hwang***, Jong-Hwan Kim.

Robot Intelligence Technology and Applications, 2022. PDF

[8] Writing in the Air: Unconstrained Text Recognition from Finger Movement Using Spatio-Temporal Convolution

Ue-Hwan Kim*, **Yewon Hwang***, Sun-Kyung Lee, Jong-Hwan Kim.

IEEE Transactions on Artificial Intelligence, 2022. PDF

[9] Type Anywhere You Want: An Introduction to Invisible Mobile Keyboard

Sahng-Min Yoo, Ue-Hwan Kim, **Yewon Hwang**, Jong-Hwan Kim.

IJCAI, 2021. PDF

[10] Marsnet: Multi-label Classification Network for Images of Various Sizes

Ju-Youn Park, **Yewon Hwang**, Dukyoung Lee, Jong-Hwan Kim.

IEEE Access, 2020. PDF

PATENTS

Substrate Inspection Apparatus and Method of Determining Fault Type of Screen Printer
Jong Hwan Kim, Juyoun Park, **Yewon Hwang**, Jin Man Park, Seung Jae Lee, Tae Min Choi, Yong Ho Yoo, Duk Young Lee.
United States · US 11,531,843 B2 · 2022.

Apparatus for Analyzing and Providing a Soft Keyboard and Method Thereof (English translation)
Jong-Hwan Kim, Sahng-Min Yoo, Ue-Hwan Kim, **Yewon Hwang**.
Republic of Korea · 10-2021-0026835 · 2021.

LANGUAGES

Korean: Native proficiency · **English:** Professional proficiency

ACTIVITIES

English MC and Commentator · AI World Cup 2018

- Hosted the event and provided match commentary in English

Learning Facilitator · Women in Engineering Program

- Led study sessions, explained concepts, and supported problem-solving and exam preparation
- Developed learning materials and examples, and fostered a collaborative learning environment to improve students' understanding and performance