Heejun Yoon

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Experience

Post-Master Researcher (advisor: Dr. Soomin Kim) *Jan 2025 –*
Center for Artificial Intelligence Research, Korea Institute of Science and Technology (KIST)

- Engaging in research on multi-view Vision-Language Models (VLMs) to enhance scene understanding.

Graduate Research Assistant (advisor: Prof. Jeongtae Kim) *Mar 2023 – Jul 2024*
Digital Signal Processing Laboratory(DSPL), Ewha Womans University

- Led the development of an inspection system for semiconductor products using machine vision techniques.

Undergraduate Research Assistant (advisor: Prof. Jeongtae Kim) *Jul 2020 – Feb 2023*
Digital Signal Processing Laboratory(DSPL), Ewha Womans University

- Worked on radar signal processing and deep learning projects such as people counting and motion recognition.

Education

Ewha Womans University *Seoul, Republic of Korea*
M.S. in Electronics and Electrical Engineering *Mar 2023 - Aug 2024*

- Advisor: Prof. Jeongtae Kim, GPA: 4.0/4.0 (4.3 scale: 4.3/4.3)

Ewha Womans University *Seoul, Republic of Korea*
B.S. in Electronics and Electrical Engineering, Magna Cum Laude *Mar 2019 - Feb 2023*

- Minor: Mathematics, Major & Minor GPA: 3.79/4.0 (4.3 scale: 3.90/4.3)

Publication & Thesis

[1] H. **Yoon**, "A Combined Twin and Single Network for Fast and Robust Inspection of IC Substrates," M.S. thesis, Ewha Womans University, 2024.

[2] H. **Yoon**, D. Yeom, S. Lee, and K. Lee, "Personal Mobility Safe Driving System with Knowledge Distillation," in *2023 IEEE 20th International Conference on Ubiquitous Robots(UR)*, 2023.

[3] H. **Yoon**, J. Park, and J. Kim, "Action recognition using 3d point cloud from frequency modulated continuous wave radar signals," in *2023 Image Processing and Image Understanding(IPIU)*, 2023.

[4] H. **Yoon**, D. Yeom, S. Lee, and K. Lee, "2-input Deep Learning based Multi-tasking Safe Driving," in *Fall Annual Conference of The Institute of Electronics and Information Engineers (IEIE)*, IEIE, 2022.

Honors & Awards

Full-tuition Scholarship based on merit | *Ewha Womans University* *Mar 2023 - Aug 2024*
BK21 Overseas Training Scholarship | *Ewha Womans University, BK21 Plus* *Jun 2023*
Kwanjeong Scholarship | *Kwanjung Educational Foundation* *Mar 2021 – Feb 2023*

- Selected as a promising student and awarded $18,000 over four semesters

Grand Prize in Undergraduate Thesis Competition | *IEIE* *2022*

- Awarded at the IEIE Autumn Conference 2022 for the Undergraduate Thesis Competition (paper link)

Gold Prize in Engineering Capstone Design Contest | *Ewha Womans University* *2022*
Dean's List | *Ewha Womans University* *Mar 2019 - Dec 2022*
Engineering Leadership Scholarship | *Ewha Womans University* *2020*
Gold Medal in AI-JAM Korea 2020 Competition *2020*

- Topic: Youtube Q&A Clustering (Project page, Github)
- Developed a clustering model utilizing NLP techniques to automatically cluster question comments
- Role as a team: constructing the overall algorithm including web scraping and tokenization, deliver of the final presentation

Selected Projects

Multiviewe Vision-Language Model for Enhanced Scene Understanding *Jan 2025 –*
| *Advisor: Dr.Soomin Kim*

- Developing a multi-view spatial understanding strategy, enabling the Large Language Model (LLM) to perform more accurate and coherent contextual reasoning about complex scenes.
- Key technologies: VLM, LLM, Multi-modal learning, token merging, 3D embedding

Deep Learning-Based Semiconductor Product Inspection *Jan 2023 – Jun 2024*
| *Advisor: Prof.Jeongtae Kim*

- Thesis for Master's degree
- Developed a lightweight twin network-based defect detection system for IC substrates, designed to be robust against mis-registration and characteristic differences
- Key technologies: Siamese Network, Change Detection, Attention, Knowledge Distillation, Vision Transformer

Personal Mobility Safe Driving Monitoring System *Jul 2022 – Feb 2023*
| *Advisor: Prof.Kahyun Lee*

- Developed a deep learning-based safety system specifically designed for personal mobility devices
- Submitted one international, one domestic conference papers based on this topic
- Role as a team: overall training of deep-learning models, hardware(Jetson Nano) setting and embedding, the application of knowledge distillation techniques
- Key technologies: Transfer Learning, Knowledge Distillation, Image Processing, Hardware Embedding

3D Beamforming-Based Estimation of Breathing and Heart Rates *Sep 2022 – Nov 2022*
| *Advisor: Prof.Jeongtae Kim*

- Investigated an approach for estimating breathing and heartbeat rates utilizing 3D beamforming-based frequency modulated continuous wave (FMCW) radar signals
- Demonstrated superior performance compared to conventional 2D beamforming methods.
- Key technologies: Radar Signal Processing, Beamforming, Signal Analysis, Experimental Design and Execution

Application of Deep Learning Techniques in Radar Signal Processing *Jul 2020 – Sep 2022*
| *Advisor: Prof.Jeongtae Kim*

- *1) Fall Detection and Pose Estimation* - 3D point cloud generation, RNN, LSTM
- *2) People Counting from Radar Data* - 2D heatmap generation, CNN
- Key technologies: Radar Signal Processing, Deep Learning for Signals

Teaching & Mentorship Experience

Teaching Assistant
Digital Signal Processing | *College of Engineering, Ewha W. University* *Fall 2023*

Undergraduate Teaching Assistant
Calculus | *College of Natural Sciences, Ewha W. University* *Fall 2019, 2020; Spring 2020, 2021*
Introductory Creative Convergence Basic Design | *College of Engineering, Ewha W. University* *Fall 2020*

Electrical Engineering Major Mentoring
Head mentor in 2021 | *Department of Electrical Engineering, Ewha W. University* *2021,2022*

Ewha Electronics Innovation
Academic club, President in 2021 | *Department of Electrical Engineering, Ewha W. University* *2019-2022*

Skills

Languages: Korean (Native), English (Advanced, TOEFL 108(R 29, L 29, S 23, W 27))
Computer Languages: (Proficient) Python, MATLAB, LATEX **(Working)** C/C++, Assembly, HTML
Mathematics and EE Courses
<Graduate Courses - *12 credits, all A+*> - *Deep Learning, Signal Processing, Big Data, CPS*
<Mathematics - *34 credits, average 3.97/4.0*> - *Linear Algebra, Calculus, Analysis*
<Engineering - *56 credits, average 3.7/4.0*> - *Signal Processing, Communication & Network, Embedded System*