

# YEONGHYEON PARK

Postdoctoral Fellow, MD Anderson Cancer Center

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## RESEARCH INTERESTS

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- Anomaly Detection
- Signal Processing
- Computer Vision
- Vision-Language Models

## EDUCATION

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**Ph.D. in of Electrical and Computer Engineering** Feb.2022 - Feb.2025

*Sungkyunkwan University*

GPA: 4.17/4.5

- Dissertation: Effective Anomaly Detection Towards Edge Computing by Leveraging Pre-trained Attention Mechanisms

- Advisor: Prof. Juneho Yi

**M.S. in of Computer and Electronic Systems Engineering**

Mar.2018 - Feb.2020

*Hankuk University of Foreign Studies*

GPA: 4.43/4.5

- Thesis: Performance Enhancement Method for Electrocardiogram Analysis

- Advisor: Prof. Il Dong Yun

**B.S. in of Digital Information Engineering**

Feb.2012 - Feb.2018

*Hankuk University of Foreign Studies*

GPA: 4.21/4.5

- Thesis: Implementation of a Real-Time Blink Recognition System using CNN

- Advisor: Prof. Il Dong Yun

- Military Service: Republic of Korea Army, Sergeant (Honorable Discharge)

Aug.2013 - May.2015

## EXPERIENCE

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**Postdoctoral Fellow**

Aug. 2025 - ongoing

*The University of Texas MD Anderson Cancer Center, TX, U.S.*

**Research Engineer**

Sep. 2019 - Apr. 2025

*SK Planet Co., Ltd., Korea*

- Expanding expertise from research and development of anomaly detection systems to the value-added services utilizing generative AIs including vision-language models
- Recognized as “**Key Talent**” for 3 consecutive years (2021, 2022, and 2023)
- **Plaster** (Planet+Master): In-house expert volunteering for lectures and group study (2021-2024)
- Developed wafer imaging system using line-scan cameras (w/ SK Hynix)

- Wafer image scanning during transport from EFEM to the chamber by robot arm
- Reconstruction of distorted wafer image by estimating the robot arm's trajectory
- Classifying wafer types for metadata mapping
- Implementation of aging-clock prediction model (w/ Bertis)
  - Develop an aging clock prediction model using the ComputAgeBench dataset
  - Achieved a correlation coefficient of 0.964 between chronological and predicted age
- Researched anomaly detection techniques to develop smart factory systems
  - Film defect classification system (w/ SKC)
  - Anomaly detection and prediction in die casting process (w/ KODACO)
  - Hyperspectral imaging-based serum anomaly detection (w/ SK Discovery)
- Spearheaded developing audio-based road anomaly detection system
  - Accelerating training and inference speed by developing compact neural network structures
  - Designing and collecting tire friction sounds under various road conditions (w/ Hankook Tire)
  - Promotional videos: [Short version](#), [Full version](#)
- Anomaly detection detection in low-cost particulate matter sensors

## Research Assistant

Oct. 2021 - Jan. 2025

*Sungkyunkwan University, Korea*

- Initiated research before official Ph.D. enrollment (Oct.2021 - Jan.2022)
- Developed pre-trained attention mechanism-based anomaly detection
- Proposed a self-supervised learning strategy using deterministic masking
- Studied solar panel anomaly detection for efficient edge computing

## Research Assistant

Sep. 2017 - Aug. 2019

*Hankuk University of Foreign Studies, Korea*

- Participated in research before official M.S. enrollment (Sep.2017 - Feb.2018)
- Researched biosignal analysis, medical image processing, and anomaly detection
- Developed an ECG-based cardiac disease diagnosis model (w/ SNUBH)
- Studied time-series anomaly detection for rapid model training
- Conducted tissue segmentation on neuroimages for medical applications

## Research Intern

Jan. 2017 - Feb. 2017

*StoryAnt Inc., Korea*

- Developed an intelligent archive system for historical document classification

## HONORS AND AWARDS

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- Key Talent Award** 2021, 2022, and 2023  
*SK Planet Co., Ltd.*  
- Recognized as an exceptional team member in annual evaluations.
- Excellence Award in Manufacturing Data Analysis Competition** Nov.2023  
*Korea AI Manufacturing Platform (KAMP)*
- Best Conference Paper Award** Dec.2021  
*IEEE International Conference on Architecture, Construction, Environment and Hydraulics*
- Minister's Commendation, Ministry of Science and ICT, IoT Awards 2021** Oct.2021  
*For AI-based road hazard detection system contributing to public safety and cost efficiency [\[link\]](#)*
- Graduate Scholarship** 2018 - 2020  
*Department of Computer and Electronic Systems Engineering, Hankuk University of Foreign Studies*  
- Full-tuition scholarship
- Excellence Undergraduate Thesis Award** Nov.2017  
*Department of Digital Information Engineering, Hankuk University of Foreign Studies*
- Academic Excellence Scholarship** 2013-2017  
*Department of Digital Information Engineering, Hankuk University of Foreign Studies*  
- Full-tuition scholarship (Spring.2016, Fall.2016, and Spring.2017), Half-tuition scholarship (Spring.2013)

## PUBLICATIONS

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### Journals

- [J8] **YeongHyeon Park**, Sungho Kang, Myung Jin Kim, Yeonho Lee, Hyeong Seok Kim, and Juneho Yi “[Visual Defect Obfuscation Based Self-Supervised Anomaly Detection.](#)”, *Scientific Reports*, Aug.2024
- [J7] **YeongHyeon Park**, Myung Jin Kim, Uju Gim, and Juneho Yi “[Boost-up Efficiency of Defective Solar Panel Detection with Pre-trained Attention Recycling](#)”, *IEEE Transactions on Industry Applications*, Mar.2023
- [J6] **YeongHyeon Park** and JongHee Jung “[Efficient Non-Compression Auto-Encoder for Driving Noise-Based Road Surface Anomaly Detection](#)”, *IEEE Transactions on Electrical and Electronic Engineering*, Jul.2022
- [J5] **YeongHyeon Park**, Won Seok Park, and Yeong Beom Kim “[Anomaly detection in particulate matter sensor using hypothesis pruning generative adversarial network](#)”, *ETRI Journal*, Dec.2020
- [J4] **YeongHyeon Park**, Il Dong Yun, and Si-Hyuck Kang, “[The CNN-based Coronary Occlusion Site Localization with Effective Preprocessing Method](#)”, *IEEE Transactions on Electrical and Electronic Engineering*, Vol.15, no.10, pp.1549-1551, Aug.2020

- [J3] **YeongHyeon Park**, Il Dong Yun, and Si-Hyuck Kang, “Preprocessing Method for Performance Enhancement in CNN-based STEMI Detection from 12-lead ECG”, *IEEE Access*, Vol.7, pp.99964-99977, Jul.2019
- [J2] **YeongHyeon Park** and Il Dong Yun, “Arrhythmia detection in electrocardiogram based on recurrent neural network encoder–decoder with Lyapunov exponent”, *IEEJ Transactions on Electrical and Electronic Engineering*, Vol.14, no.8, pp. 1273-1274, May.2019
- [J1] **YeongHyeon Park** and Il Dong Yun, “Fast Adaptive RNN Encoder-Decoder for Anomaly Detection in SMD Assembly Machine”, *Sensors*, Vol.18, no.10, pp.3573, Oct.2018

## Conferences

- [C13] **YeongHyeon Park**, Sungho Kang, Myung Jin Kim, Hyeong Seok Kim, and Juneho Yi “Feature Attenuation of Defective Representation Can Resolve Incomplete Masking on Anomaly Detection.”, *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshop (CVPR-W) 2025 (Accepted)*
- [C12] **YeongHyeon Park**, Myung Jin Kim, Hyeong Seok Kim “Contrastive Language Prompting to Ease False Positives in Medical Anomaly Detection.”, *IEEE International Symposium on Biomedical Imaging (ISBI) 2025 (Accepted)*
- [C11] **YeongHyeon Park\***, Sungho Kang\*, Myung Jin Kim, Yeonho Lee, and Juneho Yi “Exploiting Connection-Switching U-Net for Enhancing Surface Anomaly Detection”, *IEEE International Conference on Electrical, Control and Instrumentation engineering (ICECIE) 2024* (\* Equal contribution)
- [C10] **YeongHyeon Park**, Sungho Kang, Myung Jin Kim, Hyeonho Jeong, Hyunkyu Park, Hyeong Seok Kim, and Juneho Yi “Neural Network Training Strategy to Enhance Anomaly Detection Performance: A Perspective on Reconstruction Loss Amplification.”, *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2024*
- [C9] Hanbyul Lee\*, **YeongHyeon Park\***, and Juneho Yi “Enhancing Defective Solar Panel Detection with Attention-guided Statistical Features using Pre-trained Neural Networks”, *IEEE International Conference on Big Data and Smart Computing (BigComp) 2024* (\* Equal contribution)
- [C8] **YeongHyeon Park**, Uju Gim, and Myung Jin Kim “Edge Storage Management Recipe with Zero-Shot Data Compression for Road Anomaly Detection”, *IEEE International Conference on Information and Communication Technology Convergence (ICTC) 2023*
- [C7] Sungho Kang, Hyunkyu Park, **YeongHyeon Park**, Yeonho Lee, Hanbyul Lee, Seho Bae, and Juneho Yi “Exploiting Monocular Depth Estimation for Style Harmonization in Landscape Painting.”, *IEEE International Conference on Knowledge Innovation and Invention (ICKII) 2023*

- [C6] Hyunkyu Park, Sungho Kang, **YeongHyeon Park**, Yeonho Lee, Hanbyul Lee, Seho Bae, and Juneho Yi “[Edge Storage Management Recipe with Zero-Shot Data Compression for Road Anomaly Detection](#)”, *IEEE International Conference on Knowledge Innovation and Invention (ICKII) 2023*
- [C5] **YeongHyeon Park**, Myoung Jin Kim, Won Seok Park, and Juneho Yi “[Recycling for Recycling: RoI Cropping by Recycling a Pre-trained Attention Mechanism for Accurate Classification of Recyclables](#)”, *IEEE International Conference on Smart Information Systems and Technologies (SIST) 2023*
- [C4] **YeongHyeon Park**, Myoung Jin Kim, and Won Seok Park “[Frequency of Interest-based Noise Attenuation Method to Improve Anomaly Detection Performance](#)”, *IEEE International Conference on Big Data and Smart Computing (BigComp) 2023*
- [C3] **YeongHyeon Park**, Myoung Jin Kim, and Uju Gim “[Attention! Is Recycling Artificial Neural Network Effective for Maintaining Renewable Energy Efficiency?](#)”, *IEEE Texas Power and Energy Conference (TPEC) 2022*
- [C2] **YeongHyeon Park** and JongHee Jung “[Non-Compression Auto-Encoder for Detecting Road Surface Abnormality via Vehicle Driving Noise](#)”, *IEEE International Conference on Architecture, Construction, Environment and Hydraulics (ICACEH) 2021*
- [C1] **YeongHyeon Park** and Myoung Jin Kim “[Design of Cost-Effective Auto-Encoder for Electric Motor Anomaly Detection in Resource Constrained Edge Device](#)”, *IEEE Eurasia Conference on IOT, Communication and Engineering (ECICE) 2021*

## PATENTS

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### US Patents

- [US-P2] US12442796B2, [Apparatus and Method for Analyzing Road Surface Condition based on Vehicle Noise](#), Oct.2025.
- [US-P1] US12300101B2, [Apparatus and System for Detecting Road Surface Condition and Method for Detecting Road Surface Condition by Using Same](#), May.2025.

### Korea Patents

- [KR-P7] KR102843506B1, [Apparatus for detecting abnormality of Particulate Matter sensor based on hypothetical pruning Generative Adversarial Network \(HP-GAN\) and method therefor](#), Aug.2025.
- [KR-P6] KR102737477B1, [Management Method of Foreign Matter for Liquid Products based on a Graph and an Device Supporting the Same](#), Nov.2024.
- [KR-P5] KR102737476B1, [Management Method of Foreign Matter for Liquid Products and an Device Supporting the Same](#), Nov.2024.

[KR-P4] KR102609459B1, [Road condition detection device and system, road condition detection method using the same](#), Dec.2021.

[KR-P3] KR102451751B1, [ECG preprocessing method and STEMI detection method](#), Sep.2022.

[KR-P2] KR102346533B1, [Road condition detection device and system, road condition detection method using the same](#), Dec.2021.

[KR-P1] KR102179040B1, [Apparatus and Method for Anomaly Detection of SMD Assembly Device Operation based on Deeplearnig](#), Nov.2020.

## CERTIFICATIONS

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<b>NVIDIA DLI Instructor Certificate</b> [ <a href="#">link</a> ] <i>NVIDIA</i>	Apr.2022
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<b>NVIDIA University Ambassador Certificate</b> [ <a href="#">link</a> ] <i>NVIDIA</i>	Apr.2022
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<b>Big Data Analysis Engineer</b> <i>Korea Data Agency</i>	Jul.2021
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<b>NVIDIA DLI Certificate - Applications of AI for Anomaly Detection</b> [ <a href="#">link</a> ] <i>NVIDIA</i>	May.2021
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## PROFESSIONAL ACTIVITIES

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### Journal Reviewer

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| • <i><a href="#">Results in Engineering</a></i>  | Apr.2025 - |
| • <i><a href="#">Computers and Electrical Engineering</a></i>                                    | Feb.2025 - |
| • <i><a href="#">International Journal of Computational Intelligence Systems</a></i>             | Dec.2024 - |
| • <i><a href="#">Multimedia Systems</a></i>  | Dec.2024 - |
| • <i><a href="#">Discover Artificial Intelligence</a></i>  | Oct.2024 - |
| • <i><a href="#">IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT)</a></i> | Sep.2024 - |
| • <i><a href="#">IEEE Signal Processing Letters</a></i>  | Aug.2024 - |
| • <i><a href="#">Journal of Nondestructive Evaluation</a></i>                                    | Mar.2024 - |
| • <i><a href="#">Electronics Letters</a></i>   | Jan.2024 - |
| • <i><a href="#">Signal, Image and Video Processing</a></i>                                      | Jan.2024 - |
| • <i><a href="#">Scientific Reports</a></i>  | Sep.2023 - |
| • <i><a href="#">The Journal of Supercomputing</a></i>   | Aug.2023 - |
| • <i><a href="#">IEEE Access</a></i>   | Jun.2021 - |

**Conference Reviewer**

- [IEEE International Joint Conference on Neural Networks \(IJCNN\)](#) 2025
- [IEEE International Conference on Acoustics, Speech, and Signal Processing \(ICASSP\)](#) 2025, 2026
- [IEEE International Conference on Big Data and Smart Computing \(BigComp\)](#) 2025