

YeongHyeon Park

Postdoctoral Fellow | MD Anderson Cancer Center | young200405@gmail.com

[Personal Page](#), | [Google Scholar](#), | [GitHub](#), | [LinkedIn](#)

Aims

My research focuses on robust anomaly detection and efficient representation learning, leveraging advances in pre-trained attention mechanisms, self-supervised learning, and lightweight neural networks. Building on extensive real-world experience with sensor, vision, audio, and hyperspectral systems at SK Planet, I aim to expand toward scalable multi-modal sensing and foundation-model-driven applications in the physical world. I also explore generative and pre-trained models—from compact architectures to large-scale systems—to improve defect detection, reduce false positives, and strengthen reliability in industrial and medical imaging.

Education

Sungkyunkwan University

Feb. 2022 - Feb. 2025

Ph.D. in Electrical and Computer Engineering (GPA: 4.17/4.5)

Republic of Korea

- **Dissertation:** Effective Anomaly Detection Towards Edge Computing by Leveraging Pre-trained Attention Mechanisms
- **Advisor:** Prof. Juneho Yi

Hankuk University of Foreign Studies

Mar. 2018 - Feb. 2020

M.S. in Computer and Electronic Systems Engineering (GPA: 4.43/4.5)

Republic of Korea

- **Thesis:** Performance Enhancement Method for Electrocardiogram Analysis
- **Advisor:** Prof. Il Dong Yun

Hankuk University of Foreign Studies

Feb. 2012 - Feb. 2018

B.S. in Digital Information Engineering (GPA: 4.21/4.5)

Republic of Korea

- **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

The University of Texas MD Anderson Cancer Center

Aug. 2025 – present

Postdoctoral Fellow

Houston, TX, U.S.

- Research and development of brachytherapy treatment planning algorithms
 - * Implemented in-house brachytherapy treatment planning algorithms: inverse planning simulated annealing (IPSA), hybrid inverse planning optimization (HIPO), and multi-criteria optimization (MCO)
 - * Analysis and comparison of existing inverse planning methods
- Advising capstone project of Texas A&M University to develop applicator digitization algorithm
 - * Leveraging an unsupervised anomaly detection approach to detect applicator regions

SK Planet Co., Ltd.

Sep. 2019 - Apr. 2025

Research Engineer

Republic of Korea

- Led real-world multi-modal AI projects spanning vision, sensor, audio, and hyperspectral data, focusing on anomaly detection, calibration, and representation learning under practical constraints
- Expanded expertise from anomaly detection research toward telephony value-added services (VAS) using generative AI, 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 chamber by a robotic 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 the development of 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 in low-cost particulate matter sensors

Sungkyunkwan University

Oct. 2021 - Jan. 2025

Research Assistant

Republic of Korea

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

Hankuk University of Foreign Studies

Sep. 2017 - Aug. 2019

Research Assistant

Republic of 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/ Seoul National University Bundang Hospital)
- Studied time-series anomaly detection for rapid model training
- Conducted tissue segmentation on neuroimages for medical applications

StoryAnt Inc.

Jan. 2017 - Feb. 2017

Research Intern

Republic of Korea

- Developed an intelligent archive system for historical document classification

Awards

Key Talent Award

Nov. 2021, Nov. 2022, and Nov. 2023

SK Planet Co., Ltd.

Republic of Korea

- Recognized as an exceptional team member in annual evaluations

Excellence Award in Manufacturing Data Analysis Competition

Nov. 2023

Korea AI Manufacturing Platform (KAMP)

Republic of Korea

- 3rd K-AI Manufacturing Data Analysis Competition (Finalist / Excellence Award) [\[News 1\]](#), [\[News 2\]](#)

Best Conference Paper Award

Dec. 2021

IEEE International Conference on Architecture, Construction, Environment and Hydraulics

Republic of Korea

- Non-Compression Auto-Encoder for Detecting Road Surface Abnormality via Vehicle Driving Noise [\[Certificate\]](#)

Minister's Commendation, Ministry of Science and ICT, IoT Awards 2021

Oct. 2021

Ministry of Science and ICT

Republic of Korea

- SK Planet Receives the Minister of Science and ICT Award at the IoT Awards 2021 [\[News\]](#)

ITS Innovation Technology granted by Ministry of Land, Infrastructure and Transport

Apr. 2021

Ministry of Land, Infrastructure and Transport

Republic of Korea

- Hankook Tire and SK Planet's jointly developed solution was selected for the Ministry of Land, Infrastructure and Transport's "ITS Innovation Technology" contest. [\[News\]](#)

Excellence Undergraduate Thesis Award

Department of Digital Information Engineering, Hankuk University of Foreign Studies

Nov. 2017

Republic of Korea

- Implementation of a Real-Time Blink Recognition System using CNN [[Certificate](#)]

Academic Excellence Scholarship

Department of Digital Information Engineering, Hankuk University of Foreign Studies

2013 – 2017

Republic of Korea

- Full-tuition scholarship (Spring. 2016, Fall. 2016, and Spring. 2017)
- Half-tuition scholarship (Spring. 2013)

Publications

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", *IEEJ 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", *IEEJ 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

- [C14] YeongHyeon Park, Yusung Kim, Shiqin Su, Sarath Vijayan, Zhiqian Henry Yu, Mandy Cunningham "Dosimetric Impact of Hidden Input Parameters in Inverse Optimization Algorithms for GYN HDR Brachytherapy: A Systematic In-House Study", *Joint American Association of Physicists in Medicine (AAPM) | Canadian Organization of Medical Physics (COMP) Annual Meeting & Exhibition 2026 (Submitted)*
- [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*
- [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*
- [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 "Unsupervised Image-to-Image Translation Based on Bidirectional Style Transfer", *IEEE International Conference on Knowledge Innovation and Invention (ICKII) 2023*
- [C5] YeongHyeon Park, Myung 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, Myung 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, Myung 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 Myung 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

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 Deep Learning, Nov.2020.

Certifications

| | |
|---|-----------|
| NVIDIA DLI Instructor Certificate [link] NVIDIA | Apr. 2022 |
| NVIDIA University Ambassador Certificate [link] NVIDIA | Apr. 2022 |
| Big Data Analysis Engineer [link] Korea Data Agency | Jul. 2021 |
| NVIDIA DLI Certificate - Applications of AI for Anomaly Detection [link] NVIDIA | May. 2021 |

Activities

Journal Reviewer

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

Conference Reviewer

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

Leadership & Service

Volunteer Member

| | |
|---|-----------------------|
| Samsung Electronics | Jun. 2016 - Jan. 2017 |
| • Social Communication Reporters Group, Corporate Social Responsibility Program | Republic of Korea |