YEONGHYEON PARK

Research Engineer, SK Planet Co., Ltd., Korea

Personal Page, Google Scholar, GitHub, LinkedIn ◇ yeonghyeon@g.skku.edu

RESEARCH INTERESTS

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

EDUCATION

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

Research Engineer Sep. 2019 - Present

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)
- 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

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

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

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

[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*

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

CERTIFICATIONS

NVIDIA DLI Instructor Certificate [link] Apr.2022

NVIDIA

NVIDIA University Ambassador Certificate [link] Apr.2022

NVIDIA

Big Data Analysis Engineer Jul.2021

Korea Data Agency

NVIDIA DLI Certificate - Applications of AI for Anomaly Detection [link] May.2021

NVIDIA

Advanced Data Analytics Semi-Professional Nov.2020

Korea Data Agency

Deep Learning Specialization (including 5 course certifications) [link] Mar.2020

Coursera