YEONGHYEON PARK

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Google Scholar, GitHub

RESEARCH INTEREST

My research aims to maximize the efficiency in limited computational resource in the anomaly detection field. To achieve the above goal, I explore the various designs of cost-effective methods as following.

- Information enhancement through signal processing techniques
- Computational efficiency improvement through neural networks hypothesis and scale optimization.

EDUCATION

Ph.D. Department of Electrical and Computer Engineering Feb.2022 - on going

Sungkyunkwan University (SKKU)

- Advisor: Prof. Juneho Yi

M.S. Department of Computer and Electronic Systems Engineering Mar.2018 - Feb.2020

Hankuk University of Foreign Studies (HUFS) GPA: 4.43/4.5

- Thesis topic: Performance enhancement method for electrocardiogram analysis
- Thesis advisor: Prof. Il Dong Yun

B.S. Department of Digital Information Engineering Feb.2012 - Feb.2018

Hankuk University of Foreign Studies (HUFS) GPA: 4.21/4.5

EXPERIENCE

Graduate Research Assistant Oct.2021 - on going

Sungkyunkwan University Suwon, Korea

- Improving the efficiency of defective solar panel detection
  - Utilizing an MNIST pre-trained attention mechanism to emphasize the defective information
  - Conducted designing and extracting the hand-craft features to improve efficiency

Research Engineer Sep.2019 - on going

SK Planet Co.,Ltd. Pangyo Techno Valley, Korea

- Audio-based road hazard information system (ARHIS)
  - Performed development on-device computing purpose road anomaly detection system
  - Conducted constructing dataset via driving noise acquisition in various road conditions (with Hankook Tire [Press Release], [Promotional Video])
- Anomaly detection and classification in manufacturing process
  - Proposed and conducted unsupervised anomaly detection system for die-casting process

- Conducted analysis and defect classification of film manufacturing process

Graduate Research Assistant Sep.2017 - Aug.2019

Hankuk University of Foreign Studies Yongin, Korea

- Performance enhancement algorithm in cardiac disease diagnosis using electrocardiogram
  - Research myocardial infarction and arrhythmia
    (with Seoul National University Bundang Hospital)
  - Designed a preprocessing method to improve diagnosis performance
  - Studied effect according to the application of signal processing method
- Anomaly Detection in surface mounted device manufacturing process
  - Designed a learning acceleration method reducing neural network parameters.
  - Studied time-series information processing using manufacturing machine sound

Intern Jan..2017 - Feb.2017

StoryAnt INC. Yongin, Korea

- Participated national treasure document classification and management system development
  - Conducted prototype web service development including national treasure image classification
  - Studied about Machine learning basics and how to use TensorFlow

HONORS AND AWARDS

Best Conference Paper Award Dec.2021

IEEE International Conference on Architecture, Construction, Environment and Hydraulics

- December 24 - 26, 2021

Notebooks Expert Jul.2021 - on going

Kaggle

- Highest Rank 1,727 / 184,388

Graduate scholarship 2018-2020

Department of Computer and Electronic Systems Engineering, Hankuk University of Foreign Studies

- Full-tuition scholarship for full semesters

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

International Journal

[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*

International Conference

[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*

Domestic Journal/Conference

[D10] Sungho Kang, HyunKyu Park, Hyeonho Jeong, **YeongHyeon Park**, Seho Bae, and Juneho Yi "단안 영상 깊이 추정을 활용하는 객체 변환 합성", *35rd Workshop on Image Processing and Image Understanding, Feb.2023*

[D9] HyunKyu Park, Seho Bae, **YeongHyeon Park**, Sungho Kang, and Juneho Yi "양방향 스타일 변환 네트워크를 사용하는 비지도 학습 기반의 도메인 간 영상 변환", *35rd Workshop on Image Processing and Image Understanding, Feb.2023*

[D8] Myoung Jin, **YeongHyeon Park**, and Il Dong Yun "Contrastive learning 에서 positive sample 의 선정에 대한 기법", *35rd Workshop on Image Processing and Image Understanding, Feb.2023*

[D7] **YeongHyeon Park**, Myoung Jin Kim, Won Seok Park, and Juneho Yi "재활용품 분류 자동화 효율증대를 위한 어텐션 메커니즘 기반 객체분할 방법", *35rd Workshop on Image Processing and Image Understanding, Feb.2023*

[D6] Myoung Jin Kim and **YeongHyeon Park** "Attention 기반의 이상 부위 자동 labeling 기법", *34rd Workshop on Image Processing and Image Understanding, Feb.2022*

[D5] Uju Gim and **YeongHyeon Park** "이상 탐지를 위한 오토인코더 기반 잠재 벡터 확장", *34rd Workshop on Image Processing and Image Understanding, Feb.2022*

[D4] **YeongHyeon Park**, JoonSung Lee, Myoung Jin Kim, and Won Seok Park "Noise Reduction and Driving Event Extraction Method for Performance Improvement on Driving Noise-based Surface Anomaly Detection", *34rd Workshop on Image Processing and Image Understanding, Feb.2022*

[D3] Jongho Na, Hyusoung Shin, **YeongHyeon Park**, and Ildong Yun "A Study on Comparison of Sound Spectrum for Classification of Operation Status of SMT Equipment", *Journal of the Korea Academia-Industrial cooperation Society*

[D2] JoonSung Lee and **YeongHyeon Park** "다중 가설 오토인코더 기반의 이상탐지", *33rd Workshop on Image Processing and Image Understanding, Feb.2021*

[D1] **YeongHyeon Park**, JoonSung Lee, and Won Seok Park "신뢰도 기반 개별 모델 영향력을 조정하는 자체 가중치 앙상블 방법", *33rd Workshop on Image Processing and Image Understanding, Feb.2021*

PATENTS

[P3] Il Dong Yun and **YeongHyeon Park**, ECG preprocessing method and STEMI detection method, Sep.2022.

[P2] JongHee Jung and **YeongHyeon Park**, Road condition detection device and system, road condition detection method using the same, Dec.2022.

[P1] Il Dong Yun and **YeongHyeon Park**, Apparatus and Method for Anomaly Detection of SMD Assembly Device Operation based on Deeplearnig, Nov.2020.

CERTIFICATIONS

NVIDIA DLI Instructor Certificate Apr.2022
NVIDIA

NVIDIA University Ambassador Certificate Apr.2022
NVIDIA

Big Data Analysis Engineer Jul.2021
Korea Data Agency

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

Advanced Data Analytics Semi-Professional Nov.2020
Korea Data Agency

Deep Learning Specialization (including 5 course certifications) Mar.2020
Coursera