

CHANGSIK WOO

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RESEARCH INTERESTS

As an Inspection Process Engineer at LG Display, I aim to achieve Full Inspection Automation through AI. I am deeply interested in various research fields essential for automating the inspection process by utilizing diverse types of images and feature information.

- Computer Vision & Image Processing
- Image & Video Understanding
- Computational Photography

WORK EXPERIENCE

LG Display, Paju, South Korea

Jul 2016 - Present

- Job Title : Senior Engineer (Manager Level)

- **Team : Large Display Smart Factory Task** Aug 2022 – Present
 1. Trained, validated, and tested Classification Models for PXL defects (*applied*)
 2. Trained, validated, and tested Decision Tree Models by using camera feature data (*applied*)
 3. Tested and optimized Anomaly Detection Models (*PaDiM, EfficientAD*) for Mura defects (*will be applied*)
- **Team : TV Module Inspection Team – Repair Part** Dec 2021 – Jul 2022
 1. Feasibility Test & Set-up of Flat-top Beam Laser Repair Equipment for Improving Quality
 2. Improvement of Automatic Voltage Sensing Detection Algorithm for Repair Failure
- **Team : TV Module Inspection Team – Detection Part** Feb 2021 – Nov 2021
 1. Product Yield Improvement : Implemented a new PXL compensation algorithm
 2. Customer Leakage Improvement : Proposed a new automatic sensing algorithm for detecting repair failure
- **Team : CO Inspection Technology Team** Dec 2019 – Jan 2021
 1. Dispatched to Guangzhou, China to set up a new OLED module factory and achieved early stabilization of mass production
 2. Improved production capacity through optimization of re-inspection and Repair processes
- **Team : OM Inspection Team** Aug 2018 – Nov 2019
 1. Improved judgement accuracy in inspection process through standard management
 2. Proposed and Implemented new sensing algorithms for automatic detection (Previously judged manually)

- **Team : OLED Production Team** Aug 2016 – Jul 2018
 1. Managed inspection process quality and productivity to contribute to production targets
 - 2 Product Material Cost CI (Cost Innovation) Tasks : PCB Recycling (20% reduction in waste)
- **Joined the Company** Jul 2016
- **Internship Program (Recruitment-Conversion)** Mar 2016 – Jun 2016

PROJECTS

Projects Related to Inspection Process Automation at LG Display

- **Automation of Mura Defect Detection Using Anomaly Detection (PaDiM)** Jul 2023 – Jun 2024
(Status : will be applied after investment in 2025)
 1. **[Feasibility Evaluation]** The feasibility test was conducted by performing image download, preprocessing, training & modeling, and performance verification using images, ultimately achieving a level suitable for applying to mass production.
 2. **[Optimization of Image Preprocessing]** When taking images in the previous process, images may be rotated or curved due to many factors. To improve this problems, image preprocessing module was developed. That module detected edges through contour approximation, and rotation and curve problem were improved through perceptive transform.
In conclusion, PaDiM accuracy was improved. (OK : 11% → 69%, NG : 29% → 93%)
- **Automation of PXL Defect Detection Using Classification Model** Aug 2022 – Dec 2023
(Status : Applied in process)
 1. **[Training Classification Model]** By using thumbnail images, classification model was trained and applied in inspection process to classify different types of defects including over-detect. This model can be classified with 95% accuracy and over-detect can be improved by more than 70%.
 2. **[Decision Tree Analysis]** From camera inspection process, many feature data like PXL gray-levels can be collected. By using Decision Tree Classification, important feature factors and threshold were found out, and applied in inspection process to make classification model more accurate.

HONORS & AWARDS

Selection for Degree Dispatch Program, LG Display	2024
Selection for Core Employee, LG Display	2023
Early Promotion to Senior Engineer (Manager level), LG Display	2023
Company-wide Project Award from CEO, LG Display	2021

EDUCATION

Sungkyunkwan University, Suwon, South Korea

Mar 2010 – Aug 2016

B.S. in Electronic and Electric Engineering

GPA : 3.85 / 4.5

SKILLS

Languages : Python (*Intermediate, actively improving*), C++ / C (basic)

Tools : Deep Learning Frameworks (*TensorFlow, PyTorch*)

Certifications : Six Sigma Black Belt (*6σ BB*)