

USE CASE

PRINT DEFECT IDENTIFICATION USING VISION INSPECTION



CLIENT/INDUSTRY BACKGROUND

Our client specializes in design for additive manufacturing and is the only source for certified Solidworks professionals on-demand. It is also an authorized value-added reseller for HP and Markforged 3D printers. Their support capabilities include design, analysis, prototyping, product & process development. These capabilities can be utilized individually

or combined, providing clients with a complete engineering solution on-demand.

PROBLEM

- While wrapping the sticker in the winding machines at 450 meters/second a human operator can't check the quality of the print.

PROBLEM IMPLICATIONS

- Low-quality prints on stickers will hamper the brand image and the client may lose its customers
- Bad print quality will result in a bad user experience, due to the unreadability of the text written on the sticker

CLIENT REQUIREMENTS

- To inspect the printed roll running at the speed of 450 meters/second with the help of machine vision in order to improve quality standards of the product
- To auto-stop the rewinding machine if there is any defect in the print
- As the inspection is to be performed on a rewinder machine, the time for image acquisition, processing, and giving the necessary signal is less than 0.3 seconds.

CURRENT PROCESS

There is no inspection system deployed. Manually, it is not possible to inspect as the speed of the rewinding machine is very high.

BUSINESS IMPACT

1. Increase in wastage and hence increase in material cost
2. Clients will not accept the defective printed label, which causes huge losses
3. Recalling and reshipping costs will be high without an inspection system

SOLUTION USING MACHINE VISION AND AI

A camera with a specialized lens and appropriate illumination (collimated line light) is set up to identify the defects on the labels. Images are captured and sent to the software (Qualitas EagleEye® Platform) cloud where the training is done using the Deep Learning algorithm. Once the program is trained, real-time defect detection takes place. Based on which the results are communicated to PLC to take action(stop the line to remove the defective labels).

Here the **OCR and Anomaly Detection tools** are used to identify the defective labels on the rewinding machine.



WINDING MACHINE SETUP



**STICKERS TO
INSPECT**

**VISION SETUP
CAMERA AND LIGHTS**

VISION SYSTEM AND WINDING MACHINE (SETUP)

IMAGES

DETECTING DEFECTS IN QEP(QUALITAS EAGLE-EYE® PLATFORM)



CONCLUSION

POC(Proof Of Concept) is conducted and the following conclusion was observed:

1. The accuracy of identifying the defects on the labels is close to 100%
2. The machine vision system can identify and reflect the result on UI within 0.3 seconds
3. No human intervention is required



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