



CASE STUDY

Object Detection of PCB defects and Automated PCB Inspection





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Overview

Client wanted to develop machine learning model which can auto detect PCB faults as well as inspection of PCB. Corefragment Technologies developed machine learning model which satisfies client requirements.



Region
Europe



Industry
Ai & ML

Use cases



Inspection of PCB coating



Fault detection of PCB



Custom object training





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Development insights



Camera Setup: We first set up and calibrate all the cameras by adjusting their settings like frame size, color, exposure, and more. We use special boards with patterns to help align the cameras and make sure they capture clear, accurate images.



Vision Profiles: After calibration, we choose which cameras to use for taking pictures. We apply the settings from calibration to these cameras, so they work together to capture and stitch images accurately.



Project Creation: We create a project where we set up how images should be transformed and analyzed. This helps in inspecting objects, like a PCB, step by step by focusing on specific areas (ROIs).



Object Detection: For detecting defects like bubbles, we label the objects in images, train a model to recognize them, and then test the model on new images to ensure it works correctly.

Technology used

 PyTorch



 OpenCV

 TensorFlow

 matplotlib

 NumPy

 pandas



CuPy

 scikit-learn

