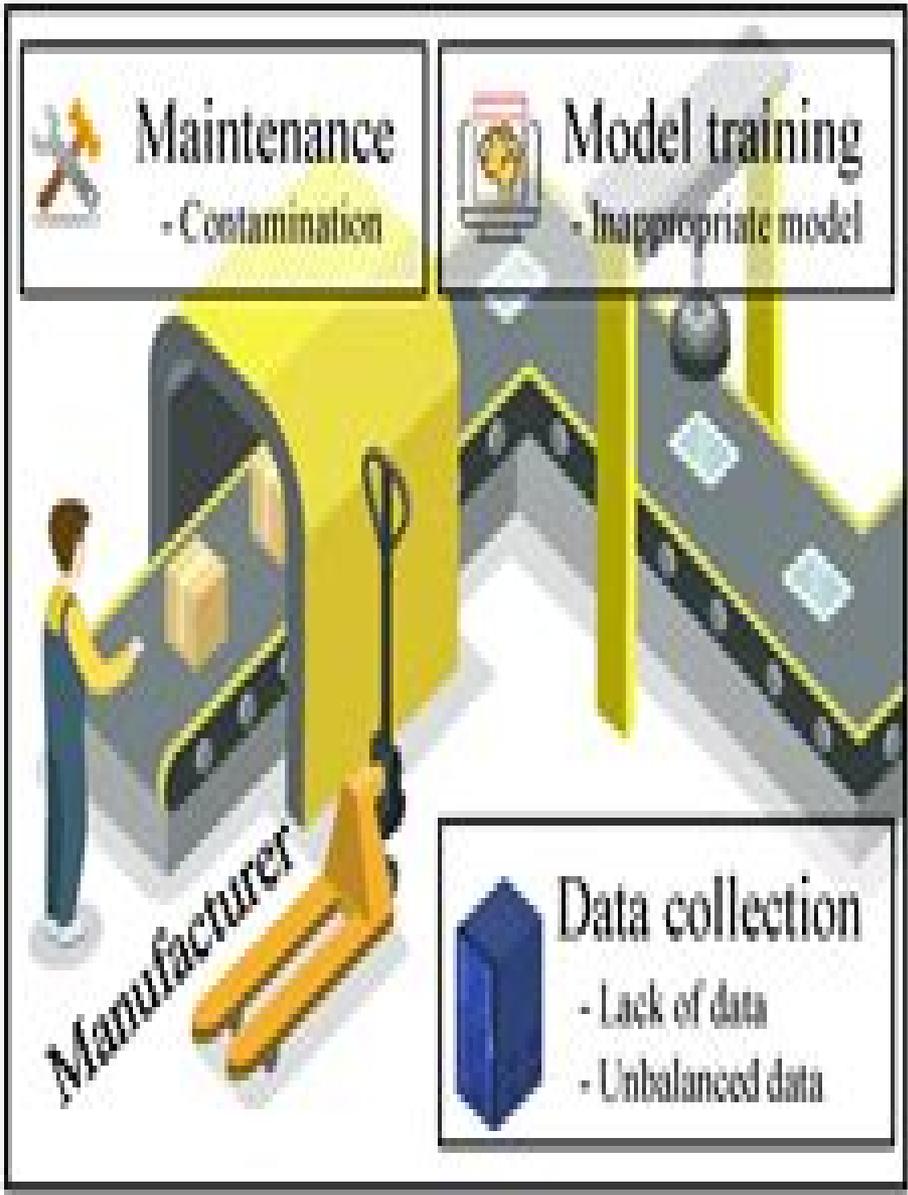




(a)



(b)

Automatic Pcb Defect Detection Using Image Smtnet

Michal Rosen-Zvi



Automatic Pcb Defect Detection Using Image Smtnet:

AUTOMATIC OPTICAL INSPECTION-BASED PCB FAULT DETECTION USING IMAGE PROCESSING, 2023 Abstract
Increased Printed Circuit Board PCB route complexity and density combined with the growing demand for low scale rapid prototyping has increased the desire for Automated Optical Inspection AOI that reduces prototyping time and production costs by detecting defects early in the production process Traditional defect detection method of human visual inspection is not only error prone but is also time consuming given the growing complex and dense circuitry of modern day electronics Electric contact based testing either in the form of a bed of nails testing fixture or a flying probe system is costly for low rate rapid prototyping An AOI is a non contact test method using an image processing algorithm that quickly detects and reports failures within the PCB layer based on the captured image A low cost AOI system has been created using commercial off the shelf components specifically for low rate production prototyping testing allowing testing of varying layers or various electronic designs without additional setup cost Once the AOI system is physically configured the image processing defect detection algorithm compares the test image with a defect free reference image or by a set of pre defined rules generated through Electronic Design and Analysis software Detected defects are then classified into two main categories fatal and potential Fatal defects lead to the board s rejection while potential defects alert the operator to determine if the board should be rejected or will still satisfy pre defined prototyping criteria The specifications of an imaging system camera sensor imaging lens and illumination set up used in the creation of the AOI were designed considering a test PCB article already in production The algorithm utilized is based on a non reference defect detection method utilizing mathematical morphology based image processing techniques to detect defects in the PCB under test

[Automatic Defect Detection and Classification System on Printed Circuit Board Inner Layer](#), 2013 **Adaptive Thresholding Method for PCB Defect Detection** Boon Hong Lim, 2009 [Morphological Image Segmentation for Detection and Classification of PCB Defects](#) Siti Hazurah Indera Putera, 2007

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