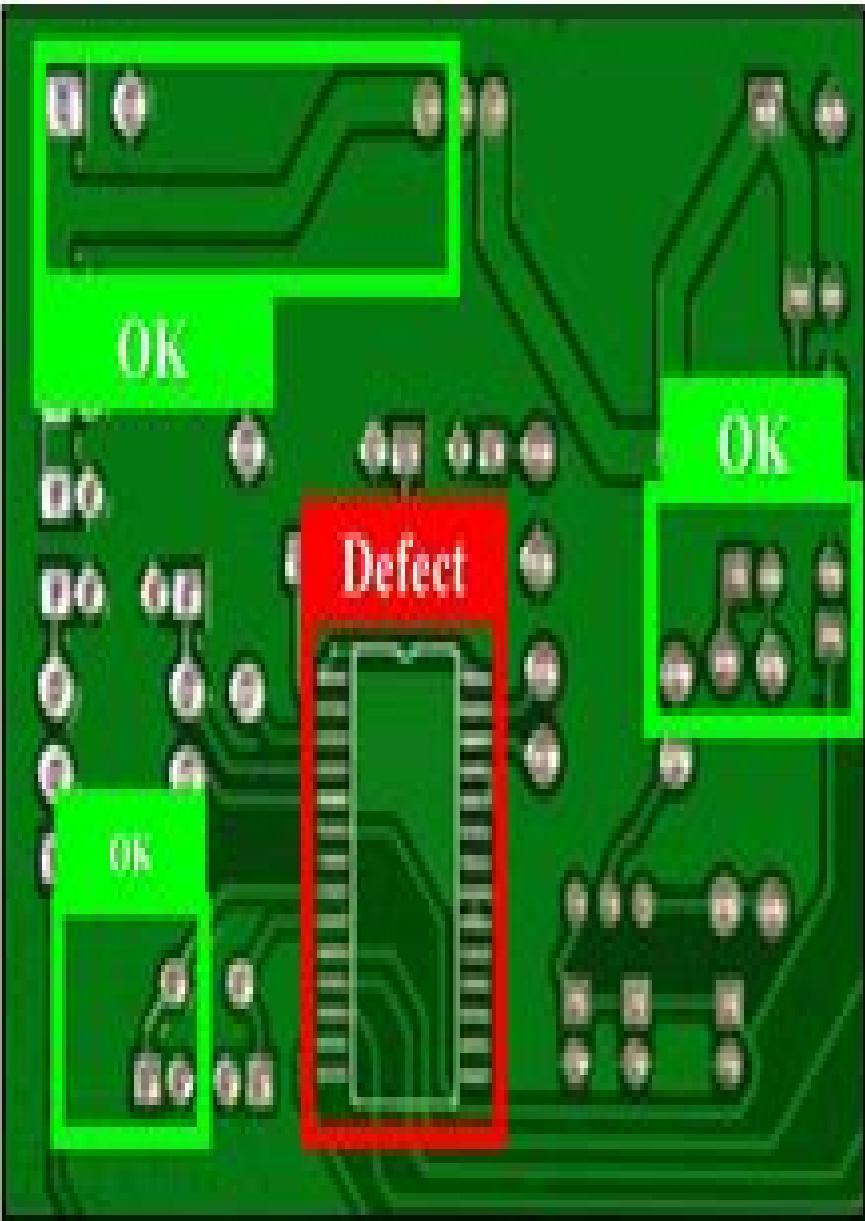
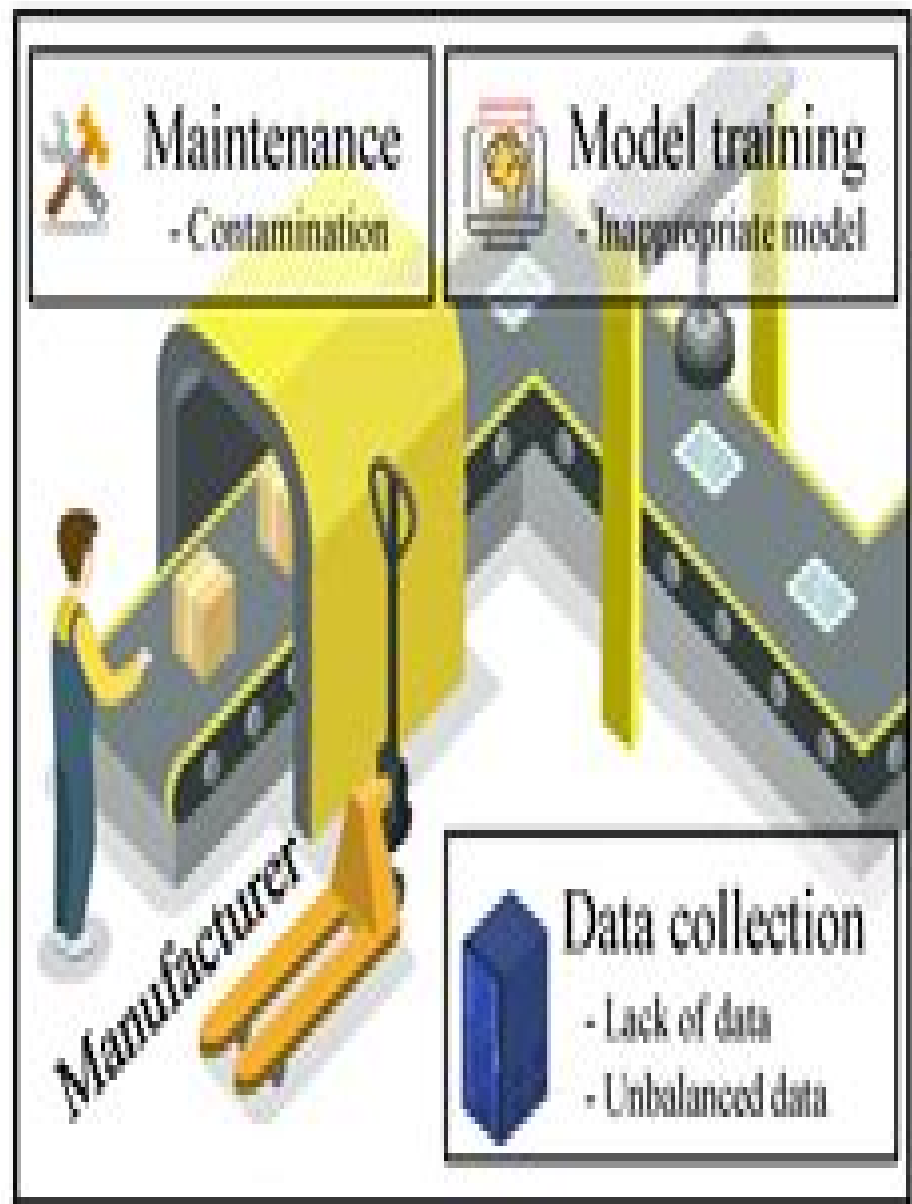




(a)



(b)

Automatic Pcb Defect Detection Using Image Smtnet

Shaun W. Lawson



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 Morphological Image Segmentation for Detection and Classification of PCB Defects Siti Hazurah Indera Putera,2007 **Adaptive Thresholding Method for PCB Defect Detection** Boon Hong Lim,2009 *Automatic Defect Detection in Industrial Radioscopic and Ultrasonic Images* Shaun W. Lawson,1996 *Defect Detection in Semiconductor Die Images* Nga-Yi Ada Ng,□□□,2017-01-26 This dissertation Defect Detection in Semiconductor Die Images by Nga yi Ada Ng was obtained from The University of Hong Kong Pokfulam Hong Kong and is being sold pursuant to Creative Commons Attribution 3 0 Hong Kong License The content of this dissertation has not been altered in any way We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation All rights not granted by the above license are retained by the author Abstract Abstract of thesis entitled Defect Detection in Semiconductor Die Images Submitted by Ng Nga Yi Ada for the degree of Master of Philosophy at The University of Hong Kong in October 2005 Recent advances in electronic technology have made integrated circuits ICs fundamental components in all electronic devices In order to increase the pro ductionyieldoftheICdies itisimportantto performqualityassuranceon them during the assembly and packaging processes Since it is often slow and difficult

for a human inspector to detect a tiny defect on a small IC die with complex circuit patterns an automatic machine vision system which uses the digital image of the IC die to perform an inspection is utilized This study aims at developing a novel reference free defect detection algorithm for the classification of normal IC dies and defective IC dies by analyzing a single captured image without using any reference image during inspection The machine vision system captures one digital image of each IC die during the assembly and packaging processes Image analysis is then carried out for each IC die image to detect any possible defect In order to visualize the IC die image it is first segmented into different regions according to its features These segmented regions ideally represent different visual patterns of the IC die including the circuit patterns and any possible defect Next a classification scheme is implemented to identify whether the IC die is defective or not Both intrinsic and extrinsic properties of the segmented regions are utilized in this classification Lastly the abnormal and irregular region is extracted out and classified as a defect Experimental results show that the proposed reference free defect detection algorithm can detect most of the defects from different types of IC dies and can also classify normal IC dies as non defective These results demonstrate the feasibility of the reference free defect detection approach An abstract of exactly 281 words DOI 10.5353/th_b3204079 Subjects Integrated circuits Testing Algorithms Performance Evaluation of Wavelet-based PCB Defect Detection and Localization Algorithm ,2002

Decoding **Automatic Pcb Defect Detection Using Image Smtnet**: Revealing the Captivating Potential of Verbal Expression

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