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AUTOMATIC VISUAL INSPECTION SYSTEM FOR PCBS

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ABSTRACT

In the modern world of technology, all the technologies are moving towards the digital implementation of product. In which the heart of this electronic production is the PCB. So there is need of producing zero defects PCBS. The defect in the PCBs are detected using the MATLAB Image Processing. We are using morphological operations such as erosion, dilation, opening, closing which helps in finding certain type of defects. This paper presents Automatic visual inspection system for producing PCBS with minimum errors or zero defects which will increase efficiency of the product.

KEYWORDS: MATLAB, image processing, printed circuit boards.

INTRODUCTION

As we are know PCB is the heart of any electronic component and we are using various electronic components in our daily life. So we have to produce zero defect PCBS which is necessisity of electronic component. we are introducing Automatic visual inspection system for producing zero defect PCBS.PCB inspection by the manual process is a very complicated process so we are introducing this computerized visual system for PCBS which will be very useful in every electronic industry.

BLOCK DIAGRAM:

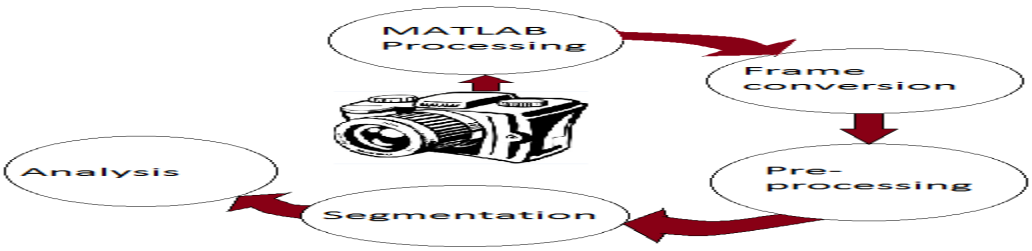

Fig: block diagram of PCB inspection system

BLOCK DIAGRAM DESCRIPTION

CAMERA:

- Camera grabbed the images of printed circuit boards and sends it to the pc so the further processes will be visualized.

FRAME CONVERSION:

- Images taken by the camera are converted into frames by the process of frame conversion.

PREPROCESSING:

- Preprocessing images commonly involves removing low frequency background noise, normalizing the intensity of the individual particles images, removing reflections, and masking portions of images.
- Basically the procedure done before processing by correcting image from different errors is preprocessing.
- In preprocessing we are performing image enhancement operation and thresholding on the PCB images.

SEGMENTATION:

- Segmentation subdivides an image into its constituent regions or objects .
- In our automated inspection of electronic assemblies ,interest lies in analyzing images of product with the objective of determining the presence or absence of specific parts such as missing components or broken connection paths.
- In the segmentation we are performing morphological operations such as erosion, dilation, opening, closing. Also feature extraction is done on sthe PCB images.

ANALYSIS:

- If we have to find missing track area then by performing subtraction operation on two PCB images i.e. one is standard PCB image and one is tested PCB image we are getting the missing track area.
- Tracks are tested by just taking the one to one difference of the two PCB images.
- Lastly with the comparison of two PCBS, that is standard PCB and tested PCB result is analyzed for its defected/not defected report.

CONCLUSION:

If the PCBS are defected then it will affect the performance of any electronic product in which they are mounted and take more time and cost to reproduce it. So by the process of automatic visual inspection we are analyzing PCBS before they are getting placed in electronic product which will reduce the time and cost and increase the efficiency of the product.

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