



# **AUTOMATED CHECKING OF PCB CIRCUITS USING LABVIEW VISION TOOLKIT**

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*Abstract: Vision Builder for Automated Inspection (AI) is an interactive and easy-to-use menu-driven configurable environment for building, benchmarking, and deploying complete machine vision applications without the complexities of programming. It has built-in deployment interface to quickly deploy any inspection, guidance, and identification applications. With this software, complex pass/fail decisions and communicates inspection results over digital I/O, serial, or Ethernet protocols are also possible. The investigator has used these attributes of the vision software to develop automated inspection of the PCB and it is working properly.*

*Keywords: Vision intelligence, PCB component checking.*

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## **I. INTRODUCTION**

LabVIEW has developed very strong vision intelligence software. The investigator has taken very useful industrial problem and has given a solution. All the pcb fabricating/Electrical and Electronic assembling organization, after culmination of the procedure physically check the PCB if every one of the segments are available or not [1],[2],[3]. In the event that any segment will be missing, then it will be send back again for correction. All of these PCB industries do this procedure physically. As the creation of complete PCB is huge (in the scope of thousand and lakhs pieces for each month), thusly enormous labour and time it takes to check all pcb[4],[5]. Generally it takes 5-20 minutes to check each PCB relying on its complexity. So to physically check 1 lakhs PCB, approximately 5-20 lakhs minutes are required. It is really a huge problem for electrical and electronics industries. It is one of the biggest challenge and hurdle in PCB manufacturing industry now days [6],[7],[8].

## **II. SMART CAMERA**

A smart camera or intelligent camera is a vision system which, in addition to image capture circuitry, is capable of extracting application-specific information from the captured images, along with generating event descriptions or making decisions that are used in an intelligent and automated system.

### **III. TOOLS AND SOFTWARES USED**

#### **LABVIEW VISION TOOLKIT**

Numerous machine-vision frameworks are required to perform pass/come up short investigations. Subsequent to deciding the particular parameters connected with the items under review, framework designers can use off-the-rack machine-vision programming to perceive great parts from terrible. In the easiest case, this may require figuring out if the length or shade of an item meets a specific resistance. Should the estimation fall outside of a worthy point of confinement, the item will be rejected.

Figuring out which picture preparing capacities are helpful in making such estimations is application particular. More unpredictable machine-vision applications—for instance, figuring out if a pizza is completely cooked—may require an examination of numerous information sorts, for example, 3-D tallness information and the shading consistency of the surface of the pie.

Various off-the-rack programming bundles permit estimations to be made; selecting the proper capacities to utilize is an assignment for the framework engineer. So also, after particular picture elements are separated, they should be grouped so an ideal pass/fall flat choice can be made. Master learning of calculations and classifiers is ordinarily required before the frameworks can be conveyed.

### **IV. INFERENCES DRAWN OUT OF THE LITERATURE REVIEW**

The investigator after going through a large number of literatures divulges the following inferences:

- Machine vision is exceptionally rising strategy of computerized modern framework/forms.
- Intelligent robots made utilizing machine visioning are additionally getting into the business sector whose working velocity and execution are of remarkable quality.
- Machine visioning expands the velocity of work, as well as the proficiency of the entire procedure gets expanded.
- Machine visioning is getting recognizable in various mechanical procedures/exercises like nourishment handling, biomedical building, creation framework, savvy apply autonomy outlining and organization, Electrical and Electronics designing and so on.
- Machine vision especially diminishes the equipment cost.
- It is one of the best strategies for atomization of various mechanical procedures now days.

### **V. PROPOSED WORK**

The main objectives of this work are as follows:

- To utilize machine vision intelligence in automated inspection of pcb for missing component
- To develop an algorithm to show that if any component in the specific pcb is missing, and then it will automatically indicate
- To develop a prototype model of DC motor control (In both directions) system and then machine vision intelligence will be used to analyze it for missing component
- Algorithm of machine vision intelligence will be developed for the prototype hardware of DC motor control

### **VI. SOFTWARE DEVELOPED**

This is the photograph of the hardware when all components are present. From the fig. below it is clear that the software has passed the hardware and it validates the software for all components present.

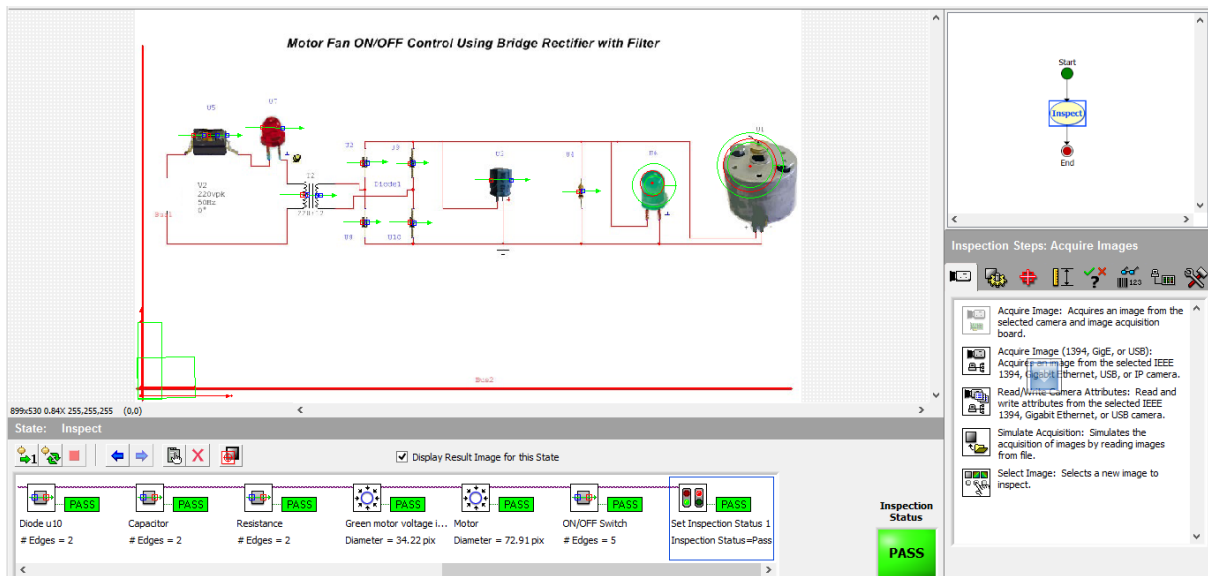


Fig. 1 All Components Present

In the fig.2 given below, photograph of the circuit is given when green motor led indicator is missing. The software developed has detected the same and hence validated for Green motor led indicator missing.

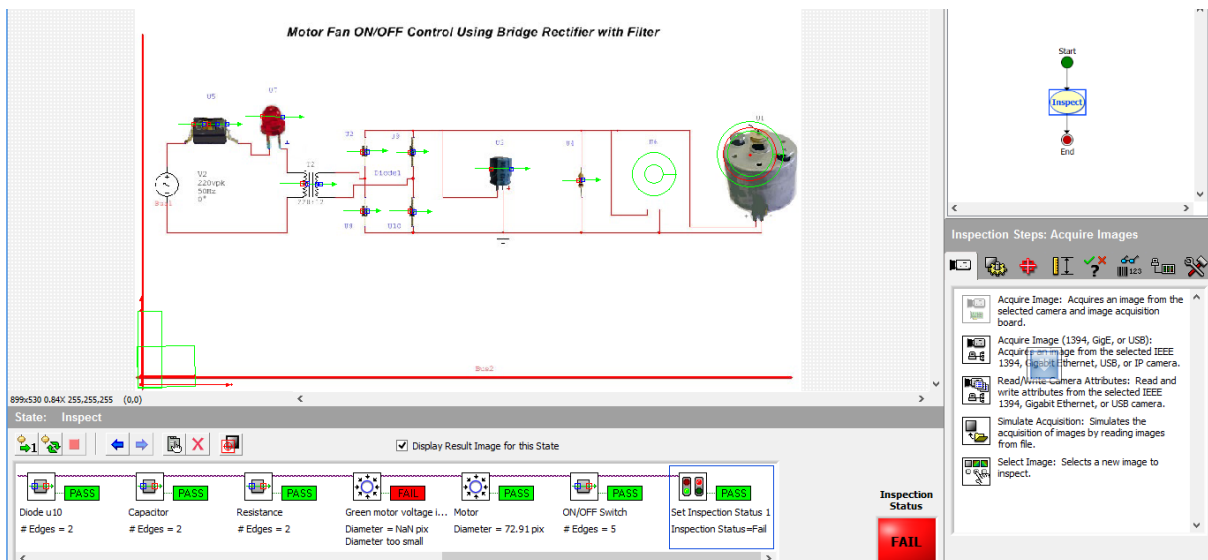


Fig. 2 Green Motor LED Missing

In the fig given below, photograph of the circuit is given when ON/OFF switch is missing. The software developed has detected the same and hence validated for ON/OFF switch missing condition.

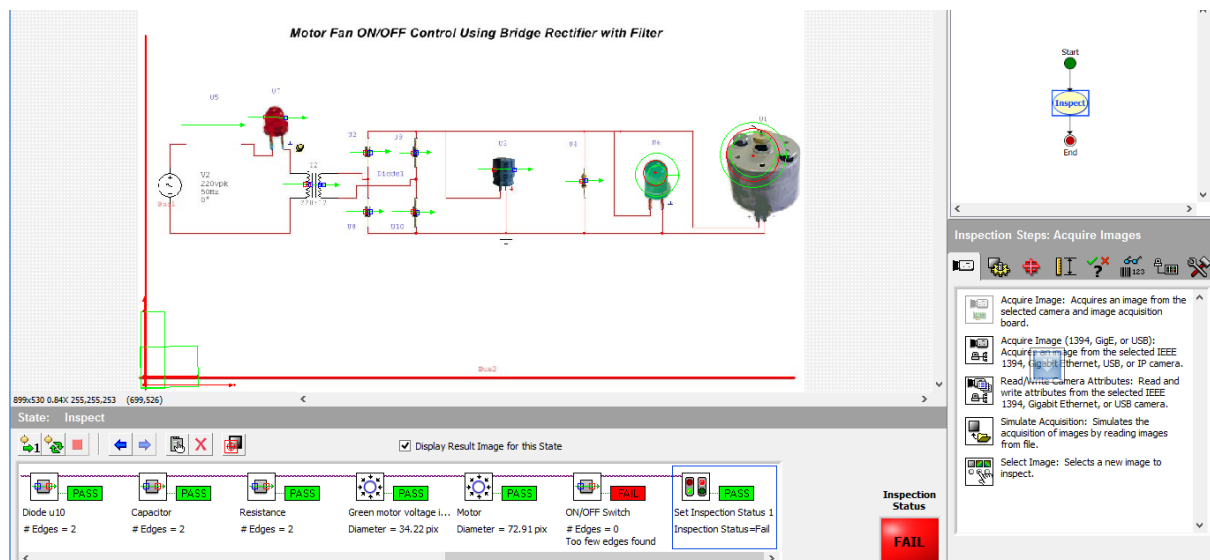


Fig. 3 ON/OFF Switch Missing

In this way all the components are tested and 100% accuracy is found.

### CONCLUSION

The software developed checks all the components of the PCB and if anything is found missing, then it detects it.

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