

PCB Inspection For Missing Or Misaligned Components Using Background Subtraction

Abstract

Automated visual inspection (AVI) is becoming an integral part of modern surface mount technology (SMT) assembly process. This high technology assembly, produces printed circuit boards (PCB) with tiny and delicate electronic components. With the increase in demand for such PCBs, high-volume production has to cater for both the quantity and zero defect quality assurance. The ever changing technology in fabrication, placement and soldering of SMT electronic components have caused an increase in PCB defects both in terms of numbers and types. Consequently, a wide range of defect detecting techniques and algorithms have been reported and implemented in AVI systems in the past decade. Unfortunately, the turn-over rate for PCB inspection is very crucial in the electronic industry. Current AVI systems spend too much time inspecting PCBs on a component-by-component basis. In this paper, we focus on providing a solution that can cover a larger inspection area of a PCB at any one time. This will reduce inspection time and increase the throughput of PCB production. Our solution is targeted for missing and misalignment defects of SMT devices in a PCB. An alternative visual inspection approach using color background subtraction is presented to address the stated defect. Experimental results of various defect PCBs are also presented.

Subject Keywords

Automated visual inspection

Background subtraction

PCB inspection