PCB Defect Detection Report

Hi there! Welcome — this is an automatically generated **PCB Defect Detection Report** created on **November 18, 2025** at **08:28 PM**. This report compares a **Reference PCB image** with a **Test PCB image** using advanced deep learning techniques (EfficientNet-B4) and classical image processing methods. The goal is to accurately detect, localize, and classify possible defects, ensuring high board reliability and production quality.

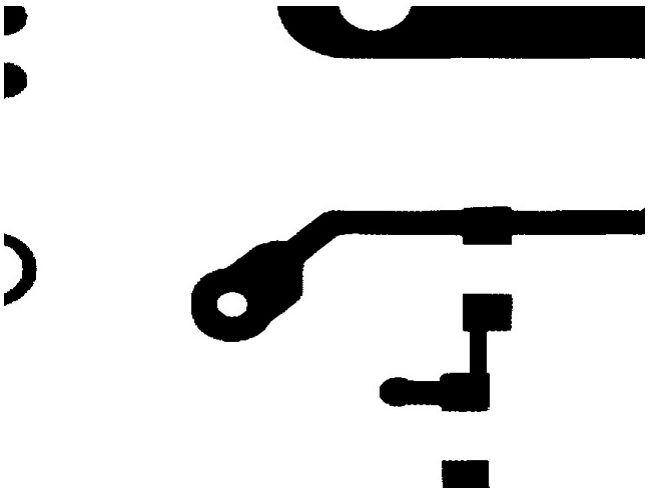
Objective

The objective of this report is to automatically identify and highlight defects such as open circuits, shorts, mouse bites, and pinholes on PCB surfaces. It provides visual insights, statistical analysis, and confidence-based defect evaluations to assist in automated quality inspection and decision-making.

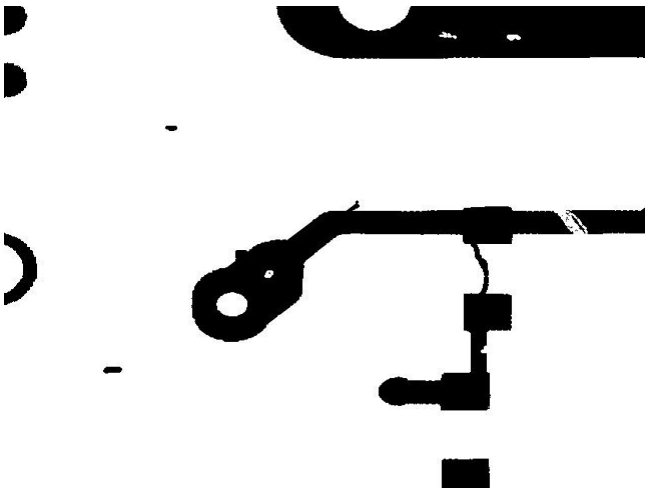
Confidence Note

Each detected defect is assigned a confidence score ranging from 0% to 100%, representing the model's certainty that a specific region contains the defect type. A higher confidence value indicates stronger model assurance and lower likelihood of misclassification.

Input Images

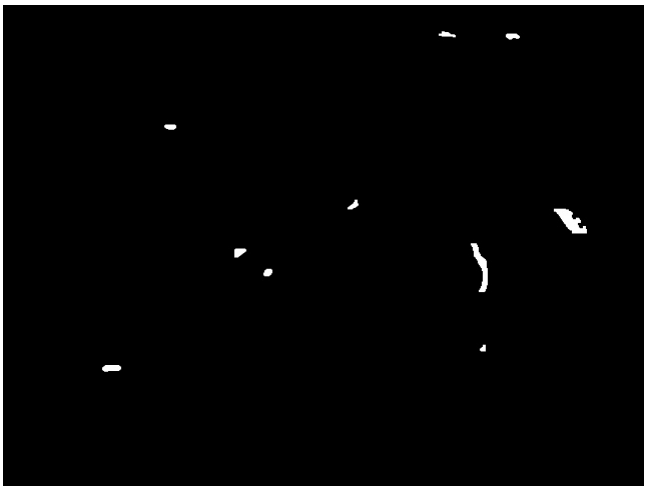


Reference Image

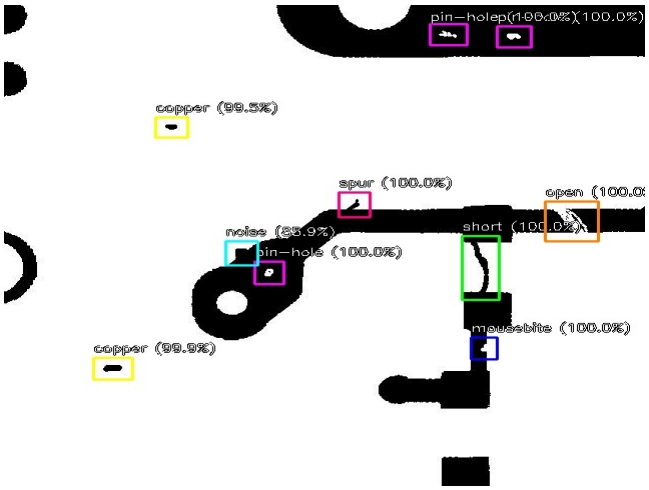


Defected Image

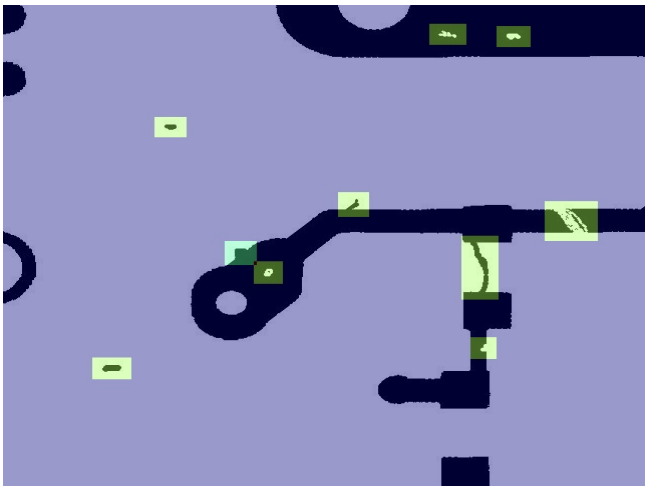
Processed Outputs



Thresholded Image



Annotated Image



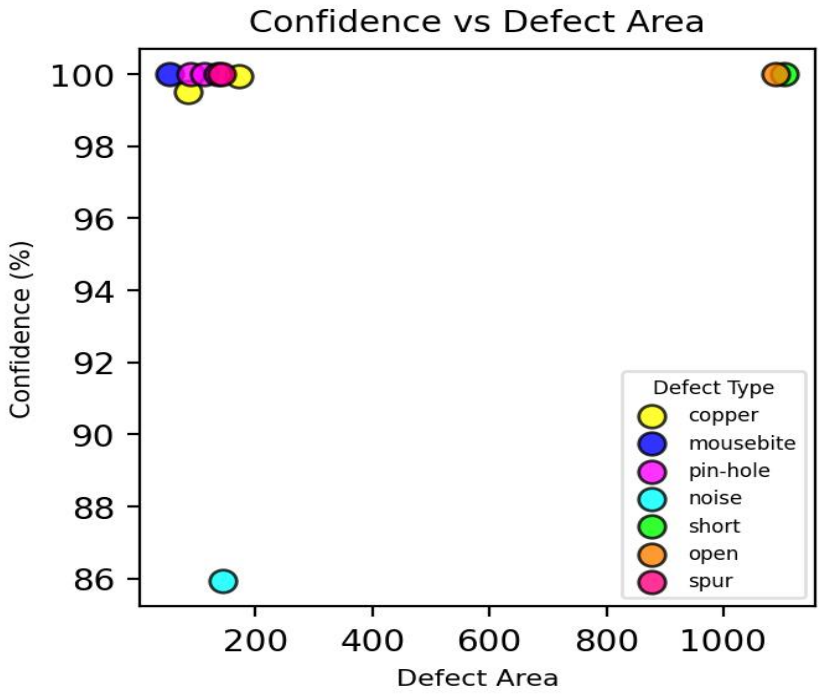
Heatmap

Detected Defects Log

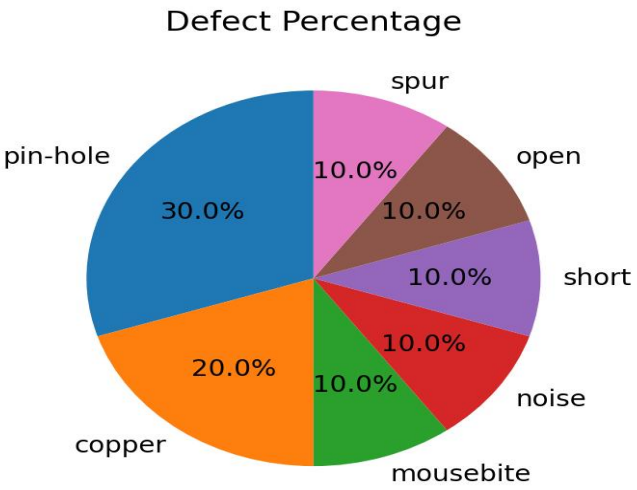
List of all detected defects with confidence and area:

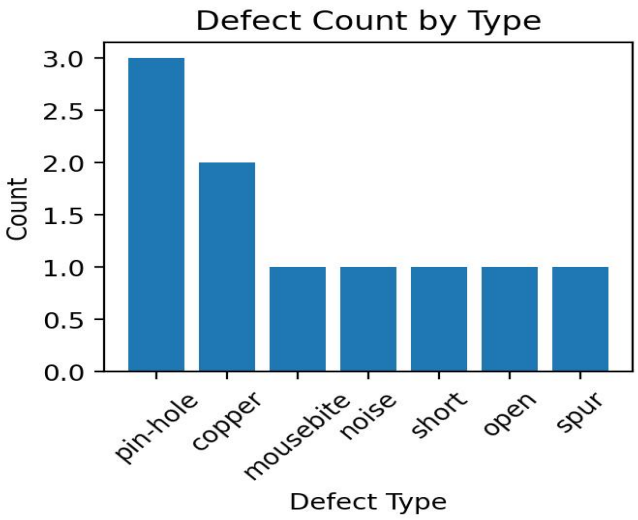
Label	Confidence	X	Y	Width	Height
copper	99.95%	89	469	19	9
mousebite	100.00%	466	442	6	9
pin-hole	100.00%	250	341	9	10
noise	85.92%	221	314	12	12
short	100.00%	457	307	17	65
open	100.00%	540	261	33	33
spur	100.00%	334	249	11	13
copper	99.49%	151	149	12	7
pin-hole	100.00%	492	28	14	8
pin-hole	99.99%	425	25	17	8

Defect Distribution



Visual Analytics





Inspection Summary

Total Detected Defects: 10
Average Confidence: 98.53%
Most Common Defect: pin-hole

Inspection Parameters:
• Kernel size used: (3, 3)
• Minimum defect area: 5
• Confidence threshold: 0.80