SolderSense

A Novel AI Failure Prediction System for PCB Solder Joints Using Thermal Imaging Analytics

Un nouveau système d'IA permettant de prédire les défaillances des joints de soudure des circuits imprimés à l'aide de l'analyse de l'imagerie thermique

產品可靠性暨系統安全研發中心 CENTRE FOR ADVANCES IN RELIABILITY AND SAFETY

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Problems | Problèmes

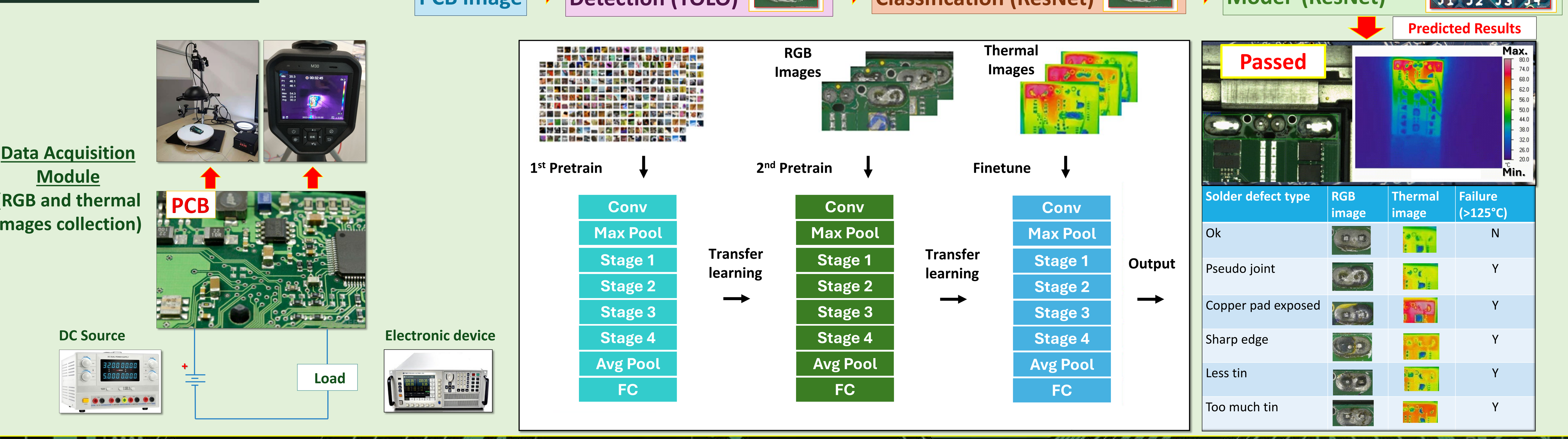
- More than 60% of electronic product failures are attributed to solder joint failures
- Lack of early detection of solder joint failure mechanisms on the production line of printed circuit boards (PCB)
- The current method relies on manual inspection, which has limited accuracy and wastes manpower

Traditional methods for locating soldering defects on PCB

CAiRS Solution, Novelty and Impact | Solution CAiRS, nouveauté et impact

- Solution: AI-Based PCB Soldering Failure Mechanism Prediction System
- Novelty: Integration of advanced deep learning models to identify PCB solder joints, classify defects, and predict failure mechanisms
- Impact: (1) Reduction in Manual Quality Checks, (2) Early Detection of Solder Joint Defects, (3) Cost-Effective Solution.

The Invention



Applications

PCB Solder Joints Failure Prediction in

- Household appliances
- Medical devices
- Mechanical engineering products
- Consumer electronics

The Achieved Outcomes | Les résultats obtenus

✓Model accuracy > 85%
✓Reduced device malfunctions by more than 25% (soldering quality issues)
✓Save > a reduction percentage by more than 30% in manpower cost

Patent/ Brevet
Title: AI-Based Failure Mechanism Prediction System and Method for PCB Solder Joints
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