Integrated Circuit Edge Damage Detection System

From left to right: Hser Htoo, Hank Stanton, Travis Barry, Ben Kazmerski

Boston Scientific

Advancing science for life™

TEAM 21

INDUSTRY REPRESENTATIVE

Matthew Koehler

Nicole Robb

Carmen Swanson

FACULTY ADVISOR

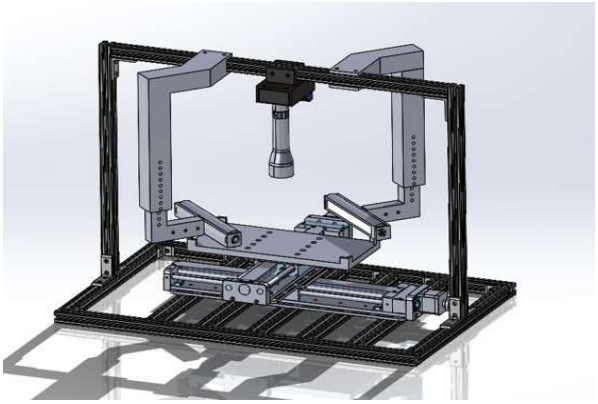
Chong Xu

PROJECT BACKGROUND & DESIGN GOAL:

Boston Scientific's Cardiac Rhythm Management (CRM) division electrically tests the robustness of over 500,000 integrated circuits annually before installing them into medical devices. **The goal of this project is to design and develop a prototype inspection system capable of reliably detecting edge damage on integrated circuits prior to assembly into finished medical devices.**

DESIGN OUTCOMES:

The team designed an automated inspection system that uses an AI-enabled camera to identify edge damage on ICs. The system positions each IC, captures images, and highlights any detected damage. This solution is intended to reduce manual inspection time and improve consistency in defect detection.



CAD model of IC edge damage detection system

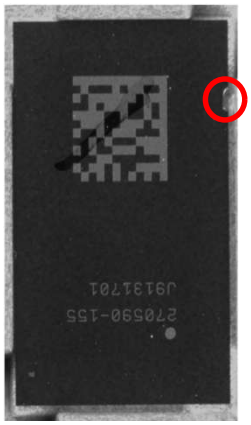


Image of edge IC damage

DESIGN CONSTRAINTS:

- Detect defect size bigger than or equal to 0.07 mm
- Save pictures of damaged ICs with defects highlighted
- Scan ICs repeatably after given user input to begin scanning
- Scanning one tray shall finish in under 1 hour
- Use off the shelf components
- Be able to fit on a 3 ft X 30 in table