

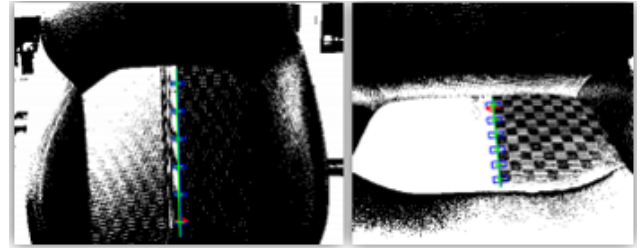
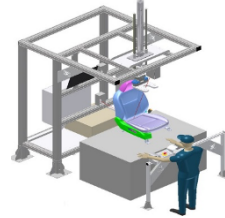
AUTOMOTIVE

Automated Vision Inspection System for Car Seat Quality



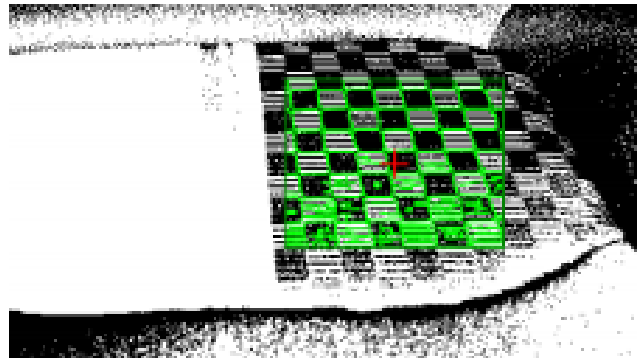
Problem Identified

Manual inspection of car seats was inefficient and inconsistent, especially under time pressure. Subtle defects like thread color mismatches, misaligned covers, and buckle misplacement were often missed. Additionally, factors such as fatigue and varying operator skill levels contributed to inspection variability. The existing manual process lacked the precision, repeatability, and speed required for modern, high-throughput manufacturing environments.



Solution Provided

A vision inspection system was implemented to automate car seat quality control. It uses a 20MP camera, red ring lighting, and a Machine Vision Platform (MVP) to perform real-time inspections with high accuracy and repeatability. The system checks alignment, model type, thread color, and buckle orientation with high precision. This automated approach replaces subjective human inspection with objective, data-driven analysis. The system also features a custom mounting fixture to ensure consistent camera placement for optimal results.



Result & Summary

the system improved inspection accuracy to over 99% and reduced inspection time by 60%. It consistently detected key issues like misalignment and thread color, although minor challenges remained with low-contrast defects and flexible parts. This vision-based system successfully replaced manual inspection with a faster, more accurate, and scalable automated solution. This case highlights how a tailored vision system effectively addressed key inspection challenges, resulting in higher accuracy, faster throughput, and consistent product quality.

