

AUTOMOTIVE

Enhancing Automotive Seat Quality with Automated Vision Inspection Technology



Problem Identified

The automotive manufacturing sector faced challenges in ensuring consistent quality control for car seat components, particularly in detecting minor defects. Traditional inspection methods were labor-intensive, prone to human error, and inconsistent in detecting subtle issues such as small white spots, ink marks, and fine scratches. These undetected flaws risked product rejections, customer complaints, and potential brand reputation damage.

The high production volume made manual inspection impractical, leading to delayed detection of defects and increased rework costs. A more reliable and automated solution was urgently needed to maintain quality standards and improve operational efficiency.

Solution Provided

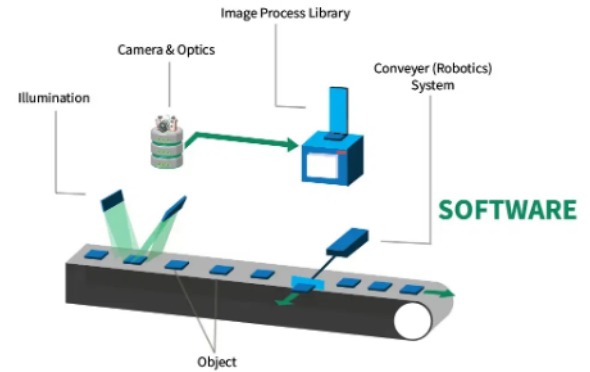
An advanced machine vision inspection system was implemented to automate the defect detection process for car seat components. The system utilized a high-resolution color camera paired with a lens and low-angle ring lighting to enhance defect visibility. Integrated with a Machine Vision Platform (MVP), it could reliably differentiate between acceptable and defective components, including wrong headrest covers, white spots, ink marks, and scratches.

The automated inspection process ensured consistent detection accuracy, reduced dependency on human judgment, and minimized inspection time. This approach significantly improved reliability compared to manual methods while maintaining compatibility with high-speed production lines.

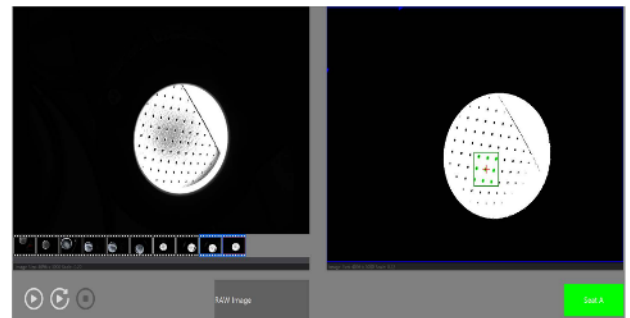
Results & Summary

The deployment of the vision inspection system resulted in accurate detection of both correct and incorrect headrest covers, as well as consistent identification of surface defects on side seat casings. White spots were detected with high precision, while ink marks and scratches were successfully identified despite variations in background contrast. The system reduced inspection errors, eliminated missed defects, and enabled real-time quality assurance during production. This improvement led to reduced rework costs, minimized defective product shipments, and increased customer satisfaction.

Overall, the production line experienced a significant boost in efficiency and defect prevention capability. This case highlights how the integration of an automated machine vision inspection system resolved critical quality control challenges in automotive component manufacturing.



Result [Headrest cover] - OK



Result [Side Seat Casing] – White Spots

