AUTOMOTIVE

Automated Vision System for Accurate Product Presence

Problem Identified

The production line faced recurring challenges in detecting the presence or absence of canned products during high-speed packaging. Manual inspection was time-consuming, prone to human error, and inconsistent under varying lighting conditions. Poor image quality due to insufficient lighting or excessive camera gains further reduced the reliability of detection.

This led to potential defective products reaching the market, impacting brand reputation and increasing rework costs. There was a clear need for a reliable, automated solution that could work consistently in diverse environmental conditions.

Solution Provided

An automated vision inspection system was implemented using advanced image threshold and blob detection techniques. The system was designed to accurately determine the presence or absence of canned products, with an integrated OK/NG output signal for real-time rejection of defective items. Enhanced lighting control was applied to ensure consistent image quality. This approach eliminated the need for manual checks, reduced operator workload, and ensured uniform inspection accuracy.

Compared to existing manual methods, the solution provided higher speed, better consistency, and adaptability to production variations.

Results & Summary

The implementation achieved 100% detection accuracy during testing under optimal lighting conditions. Products with missing items were consistently flagged as NG, while complete products were accurately categorized as OK. The improved lighting setup significantly enhanced feature extraction, even in challenging scenarios. This eliminated the risk of defective products leaving the facility and reduced inspection time by a substantial margin. The results clearly showed improved quality control, reduced manpower requirements, and minimized defective product output.

This contributes to higher operational efficiency and better customer satisfaction within the food manufacturing industry.