

# AUTOMOTIVE

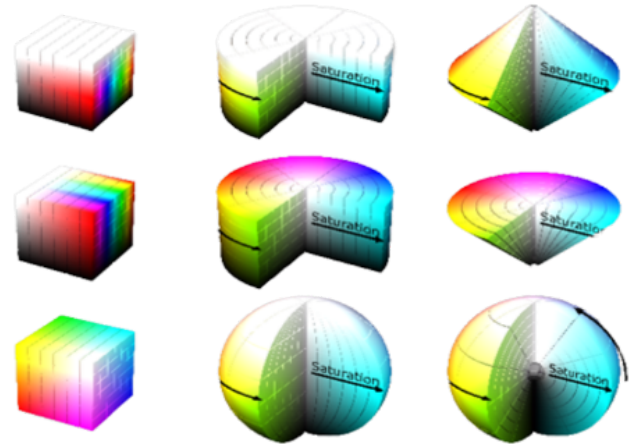
## Advanced Color Line Detection System for Dynamic Tyre Manufacturing Processes



### Problem Identified

In the tire manufacturing process, multiple-colored lines are applied to tires to indicate the specifications, batch identification, and type. These colored lines vary in type, position and sequence that change approximately every 20 minutes based on the type of tire. Manual inspection was prone to errors which resulted in inconsistencies, delayed production adjustments, and potential quality issues.

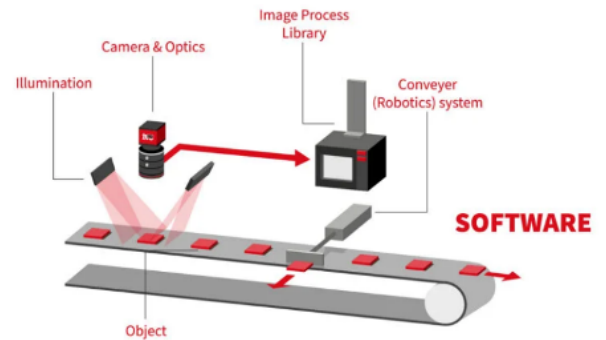
The challenge was to accurately detect the color, width, distance between colors, and precise coordinates of the colored lines in real time. Additionally, the system needs to compare detected colors against a database and exchange data seamlessly with other software.



### Solution Provided

A high-precision vision inspection system was developed using two detection methods which were direct color feature matching for distinctly different colors, and HSV domain conversion for more subtle color differentiation. The RGB images captured were converted to hue values for accurate identification, even when dealing with a high number of possible color variations. A line measurement tool within the software allows for accurate width, distance, and coordinate extraction.

The solution also included database integration for color comparison and API communication for data sharing. To ensure an optimal accuracy, the system was trained with multiple sample images to adapt to varying conditions and improve recognition performance.



### Results & Summary

Present the results achieved by implementing the solution. Quantify the impact using metrics and data. Include relevant statistics and graphs. Highlight any significant improvements or positive outcomes. Compare the before-and-after scenario to demonstrate the effectiveness of the solution.

This report highlights a critical industry problem, presents an effective solution, and showcases the positive results achieved. mention the overall industry benefit, e.g., increased efficiency, reduced costs, enhanced sustainability.

