Bluewrist Case Study

100% Inline Seating Inspection for Unseated Connectors

Our Client

Bluewrist worked with a Fortune 500 company that manufactures vehicle seats for automotive businesses worldwide. A typical vehicle seat has 20+ features, including multiple connectors for seat motors, the engine control unit, air bag, sensors, and the safety belt warning system. These electrical connectors and sensors are installed into a vehicle's seating frame before it is upholstered and put in place.

The Challenge

Our client's plant produces over 2,000 seats daily, and their practice was for each connector to be manually and visually inspected by a line operator. Given the high volume they were working with, the line evaluation process was prone to human error – an issue that was highly apparent when operators failed to notice a red rabbit that was added to the production line. This routine test, designed to audit production quality and enhance quality assurance, highlighted the need for a solution that could identify potential defects in this complex component.

In addition, the plant had received numerous warranty claims related to unseated connectors. More often than not, this was caused by human and mechanical errors. When connectors are improperly installed or incorrectly seated, they can become disconnected. Since many of these are fitted inside upholstered seats, any issues can compromise occupant safety and result in an expensive recall, as repairs sometimes require a complete seat replacement. The company approached Bluewrist for a more sophisticated, consistent, and effective solution to enhance customer satisfaction and reduce the cost of warranty claims.

The Solution

To improve the speed and accuracy of the quality assurance process, Bluewrist developed a system whereby four 3D structured light cameras were mounted to 4 collaborative Fanuc robots. Due to the highly intensive manual craftsmanship involved in seat manufacturing, the robots work alongside a human operator. Bluewrist industrial communications software, comXtream, was deployed to manage communication between the different devices.

It effectively synchronized the robots and triggered

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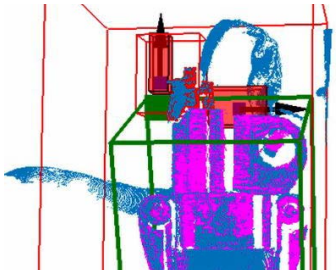
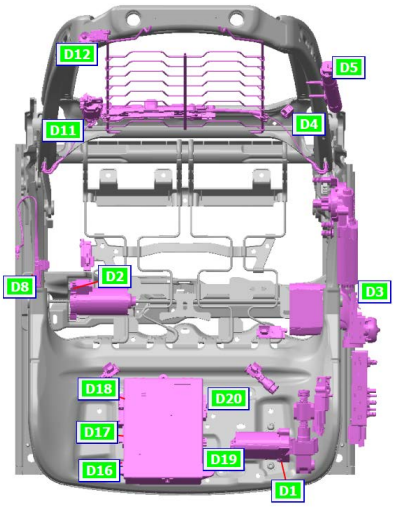
cameras to capture a point cloud image. The cameras are now capable of detecting different types of defects, such as soft set connectors that can come apart with road vibrations or open and missing clips. In tandem, ScanX-tream software analyzed the 3D point cloud of the clips and connectors to check for various types of defects. To verify correct installation and clip engagement, Bluewrist 3D vision algorithm compared the 3D point cloud data to the correct predefined reference position.

SPCWorks then collects, analyzes, and displays the results for the end user. The results of the inspection are displayed graphically to help quality assurance personnel identify issues immediately and rework defective components.





Various connectors, point cloud and inspection results

The Results

Following the implementation of Bluewrist's system, our client achieved 100% inline inspection of all seating without slowing down the rate of production. Any out-of-tolerance or incorrect installations are now highlighted immediately, so they can be rectified. When it comes to identifying non-engagement or defective connectors, the Bluewrist system is over 99% accurate.

Together with SPCWorks, our client gained a better understanding of the real-time production trends, quality variances, and overall stability of the plant to further improve upon the quality of their product.

Contact Bluewrist Today!

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