The Impact of Vision Guided Robots in the Automotive Industry

By: Lauren North

Robots have been speeding up automated processes for over 60 years, and innovation has led to vision-equipped robots, which may disrupt the world of manufacturing as we know it. The robotic markets are making billions in sales, and the automotive industry accounts for half of those purchases.

 They can examine 30,000 different parts much faster and more accurately than their human counterparts. They can identify incorrect part placement or missing pieces, which could mean the difference between a happy customer or a recall.

The Capabilities of Robot Vision

The robots' vision systems can identify parts, assemble them, use screwdrivers, or do welding. It can also check the quality of parts and recognize defects that human eyes may not have seen. They can even perform self-maintenance while working.

Inspections by vision-guided robots increase productivity, efficiency, reduce costs, and improve accuracy. Robots with vision don't need reprogramming to complete a variety of functions. "Seeing" robots can use lasers to recognize malfunctioning parts of a vehicle. They can paint cards and do much of the assembly line work.

Most Common Robot Applications

in the Automotive Industry

Six robotic applications are the most common in the industry. Collaborative robots work with other robots handling and welding to make assembly-line processes run smoothly. Painting robots can save professional painters from highly toxic exposure. They can consistently and evenly paint large areas.

Some robots put in pumps, motors, install windshields, and mount steering wheels. Others can do the trimming and cutting of fabrics and plastics. Robots save people from other dangerous tasks like pouring molten metal and loading and unloading CNC machines.
Machine vision is unique. It can inspect a wide array of car parts like batteries, brakes, airbags, panels, valves, fuse boxes, and windshields. They assemble gears and clutches. Ford Motor's Van Dyke Plant has over 500 machine vision applications. This vision technology is there to check for defects and make sure assembly is correct before moving down the line to the next step.

Amanda Nelson, Banner Engineering Corp product manager, says, "Machine vision is replacing the need for human visual inspection, reducing errors, creating a vehicle history trail, and improving quality. In many cases, it helps speed up the inspection process required at many steps within the automotive assembly process."

Robots, 5G, and the 4th Industrial Revolution

Vision guided robots may become even more advanced and capable as 5G makes its way into the industry. Seeing robots will help drive the 4th Industrial Revolution by increasing flexibility, increasing automation, improving productivity, and maintaining safety and sustainability. Implementing this innovative technology makes the workplace more efficient, safer, and gives a high return on investment!

Satyam Vaghan, vice president and GM of AI and Internet of Things (IoT) at Nutanix, Inc, says, "5G is beneficial for manufacturers because it allows them to optimize the factory floor layout and improve production standards, ultimately leading to faster production." The merging of these two technological innovations may provide more than we've ever expected.

Lee Yee, vice president of marketing at AMAX, says, "There are so many things that can be connected and interconnected across the factory. The cords for many machines don't need to be 'cut' in (applications) where there is not a lot of mobility. However, smart wireless tools, sensors, cameras, and interface devices help to create an intelligently aware (environment) across various manufacturing and maintenance processes."

With these advances and the significant accomplishments made with artificial intelligence, we're not too far off from entirely automated "Smart Factories!"

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