High Speed Robotic Vision Guided Systems for Parts & Material Handling

CHRISTOPHER CLARK
President
BHS Robotics Inc.

BHS Robotics

ARTICLE TAKEAWAYS:

- Vision systems detect part presence and defects
- Robotic systems pick and place random sized parts

Lean manufacturing principles have long been a driver of automated processes to replace inefficient manual process to both reduce labor costs and errors. Robotics in particular have been an attractive solution to foundries as in addition to lifting heavy castings, they also reduce worker injuries.

Over the years, robotic handling and picking has been greatly enhanced with vision-guided systems. 3D part picking and handling is now a common solution and especially using for high-speed picking of precision parts. Additionally, parts handling from racks or conveyors is easily handled by vision systems that identify damaged parts, or parts that were inaccurately placed on the rack or conveyor. Any manufacturer making automotive, aerospace, machinery or any application with a large number of parts will benefit from this reliable robotic vision inspection system.

Co-packers of heavy castings and a long list of service parts employ these systems as will seamlessly pick and place small-to-heavy parts easily using a variety of end-of-arm tooling and quick-change tools. These robotic systems are ideal for equipment assembly, packaging, part loading/unloading and palletization.

Until now—palletizing was limited to handling a narrow number of case sizes with a known stacking sequence. Combining technologies of BHS Robotics Depalletizing Platform, CMES Vision & AI Algorithm, ABB & Fanuc—the mixed palletizing solution can handle almost any type of parts, boxes, cartons, bags, and pallet types while reducing labor and injuries related to tedious manual labor.

So many of these systems can be installed and ready to work, on day one and include the robot, 3D vision camera, support frame, Allen-Bradley PLC and HMI, safety light curtain, machine guarding and system programming.

Vision system applications:

- Pattern matching
- Heavy moving for other finishing processes (such as grinding)
- Absence/presence detection
- Bar code reading
- Defect detection
- Part verification
- Packing/bagging
- Random palletization

BHS Robotics has installed various vision systems for demanding manufacturing environments that are reducing overall production costs due to elimination of errors and reducing labor costs.

One system is proving critical to the logistics market in terms of being able to handle heavy parts and boxes in a random/mixed case palletization. The other installation is a high-speed part picking flexible system—managing large quantities of bulk product (bolts, dowels, pins, washers, etc.) and bags them into smaller part quantities.

The system was designed to process different size products ranging from 20-110mm in size and uses a flexible parts feeder (Flexibowl), Cognex Vision

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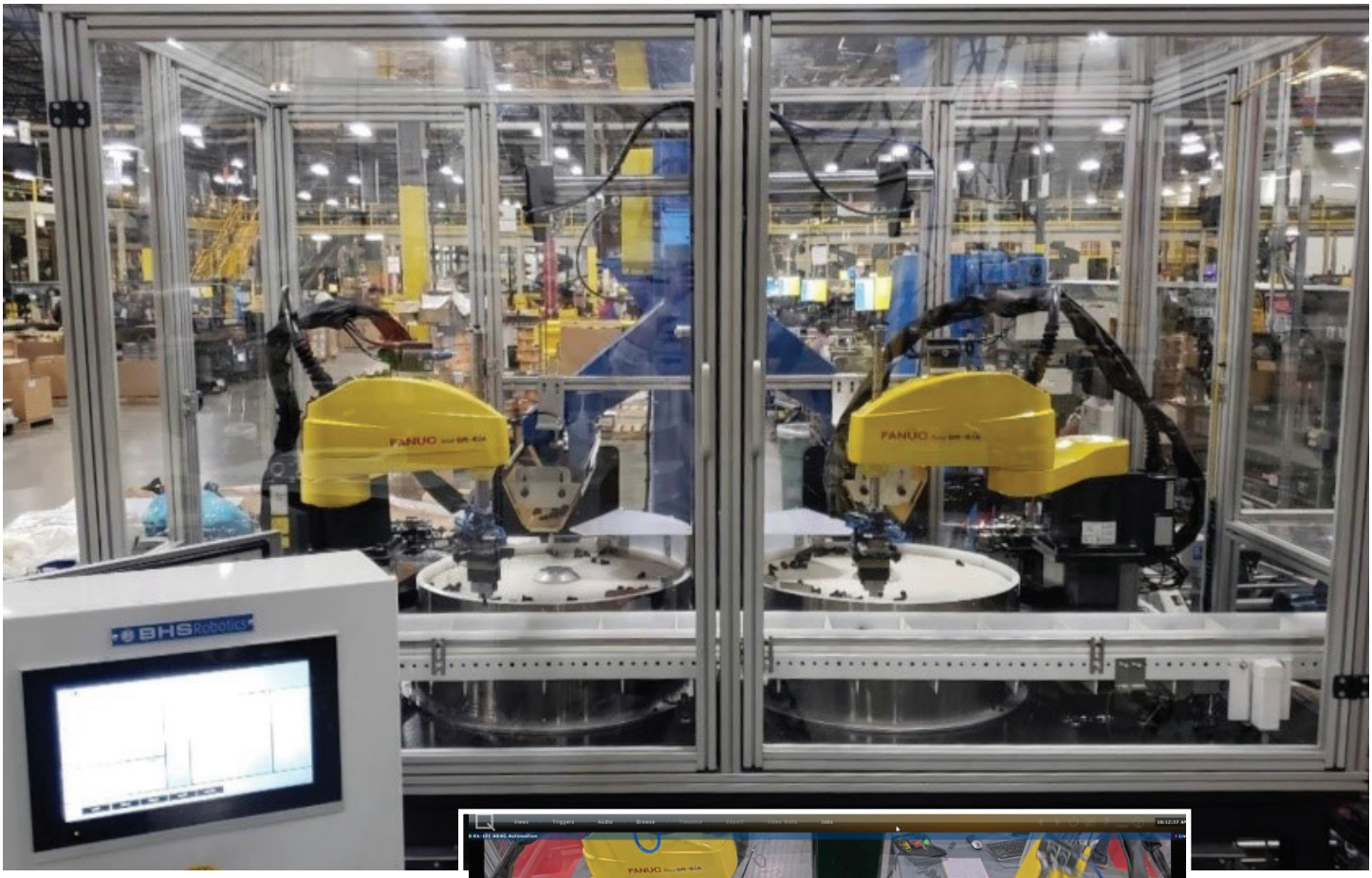

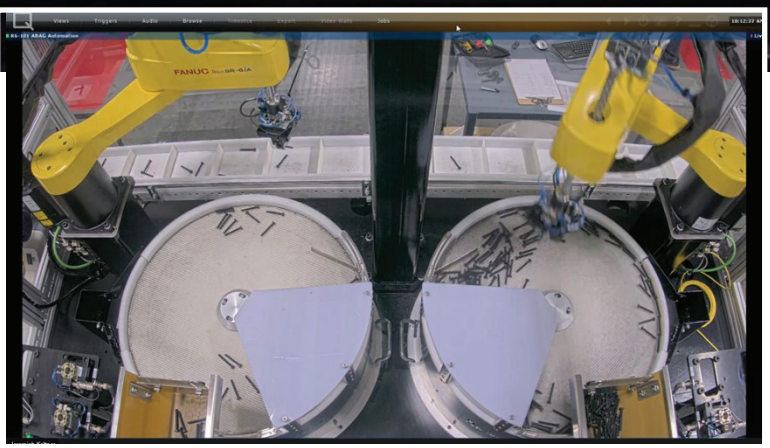

System, Fanuc SR-6iA Selective Compliance Articulated Robot Arm (SCARA) with four different quick-change end effectors, lug conveyor, and an auto bagging system. The complete system is capable of achieving 40-45 picks per minute per robot (2 robots total in system) and can change over to a different part style within minutes.

Today's vision system detects the parts positioning, determines the number of pickable parts and sends a signal to the SCARA Robot to pick the parts in variable positions. One of the best features of the system is the ease in which new parts can be taught and incorporated into a part recipe within minutes.

Vision inspection systems are being used in all manufacturing environments, especially metal and die casting. Robots carry the heavy work load while increasing productivity. Robotics do the heavy lifting that employees never liked to do. Additionally, when you train an employee to become a robotic work cell operator, you are also training someone that will grow with you. Adding a vision-guided system, makes that work cell that much more productive.

Contact:
CHRISTOPHER CLARK
cclark@bhs-robotics.com

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Automation Systems for Manufacturing

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— Automation Systems Integration
— High-Speed Vision Guided Systems
— Robotic Pick & Place Systems
— Vision Solutions – 3D, Linescan, Barcoding

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865 MUIRFIELD DR., HANOVER PARK, IL 60133 USA 1.630.784.0800 BHS-ROBOTICS.COM