FANUC America Demonstrates a Variety of 3D Bin Picking Applications with the Next Generation iRVision 3D Area Sensor at IMTS 2014

For Immediate Release

ROCHESTER HILLS, Mich., Sept. 8, 2014 – FANUC America Corporation demonstrates a variety of bin picking applications with FANUC intelligent robots and the next generation iRVision® 3D Area Sensor during IMTS 2014, Sept. 8-13, at McCormick Place, Chicago, booth #S-8919.

FANUC will feature the following 3D bin picking demonstrations:

High Speed Bin Picking

A new LR Mate 200i/D/4SC clean room robot equipped with FANUC’s new iRVision® 3DA/400 Area Sensor locates and picks randomly oriented bottle caps from a bin. The 3DA/400 Area Sensor provides 3D location of the bottle caps in the bin. The robot picks the bottle caps from the bin and places them in a second bin at high speeds. iRVision’s Interference Avoidance feature prevents the robot and tooling from coming in contact with the bin walls. DCS Speed and Position Check Software restricts the travel of the robot to the exact area in which it works.

The new LR Mate 200i/D/4SC has an ISO Class 4 (Class 10) clean-room certified for electronics and pharmaceutical applications. It features a white FDA compliant coating, stainless steel wrist, and NSF-H1 grade grease on all joints to provide reliable performance in demanding production environments, including rigorous sanitation procedures. The high-speed LR Mate 200i/D/4SC has a maximum speed of 4000 mm/sec., and includes a bottom cable exit option, making it ideal for clean room and food handling applications where a small footprint is required.

FANUC’s new high-speed iRVision 3DA/400 Area Sensor is the compact version of FANUC’s iRVision 3D Area Sensor. The 3DA/400 Area Sensor is designed for use with a small or medium size robot with smaller containers measuring less than 400mm long x 300mm wide x 300mm high.

Cylindrical Part Bin Picking

A new M-20iA/35M six-axis robot equipped with a rail-mounted iRVision 3DA/1300 Area Sensor locates and picks randomly located cylindrical steel billets from a storage container. The 3D Area Sensor uses FANUC’s new cylinder finder function, which enables the robot to locate and stably pick cylinders of a specified length and diameter without picking two cylinders or causing a failure to pick. iRVision’s Interference Avoidance feature prevents the robot and tooling from coming in contact with the bin walls. DCS Speed and Position Check Software restricts the travel of the robot to the exact area in which it works.

FANUC® is a registered trademark of FANUC America Corporation.
Avoidance feature prevents the robot and tooling from coming in contact with the bin walls.

After locating a part, the robot picks it with its magnetic gripper then places it on a conveyor in a consistent orientation. The conveyor pushes the cylinders down to a second storage bin.

The 3DA/1300 Area Sensor is top-mounted on an auxiliary axis-powered rail, allowing the robot to directly control the movement of the sensor. Mounting the sensor this way gives the robot two bins in which to work from. As soon as the robot recognizes that one bin is empty it will automatically switch to the next one, saving downtime that would be required for an operator to change the bin manually.

The M-20iA/35M includes a 35kg payload option for FANUC’s M-20iA series robot. It features flexible mounting, easy dress out options, and includes a high load capacity wrist that is ideal for heavy payloads.

**Bin Picking Gripper Interactive Display**

IMTS attendees will be able to directly experience the sure grip of FANUC’s new Bin Picking Gripper. Wearing a protective safety glove, attendees will place part castings of different shapes and sizes inside the gripper opening. A button is pressed to close the gripper, and the Bin Picking Gripper’s 6kgf gripping force is applied to the part. The new Bin Picking Gripper can securely grip parts weighing up to 2kg with a maximum finger opening of 90mm.

**Flexible Gripper Bin Picking**

An M-20iA equipped with an iRVision 3DA/1300 Area Sensor locates and picks randomly oriented valve parts at high speeds using FANUC’s new flexible Bin Picking Gripper. The 3DA/1300 Area Sensor provides 3D location of the parts in the bin. The robot picks the parts and places them on a conveyor that transfers the parts to a second bin. When the first bin is emptied, the robot will pick the empty bin and set it aside while the bin full of parts moves on a conveyor to the pick position beneath the 3DA/1300 Area Sensor, and the cycle repeats.

FANUC’s new flexible Bin Picking Gripper is ideal for the parts in this bin picking application. The valve parts are non-ferrous and have no flat surfaces where a vacuum cup could be used for gripping. The valve parts would be very difficult to locate using conventional 2D vision, especially when all are nested together in a bin.

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RVision’s new Gripper Finger tool analyzes the 3D point cloud created by the 3D Area Sensor and locates areas where the gripper fingers will fit to grip a single part. FANUC’s Bin Picking Gripper can securely grip a variety of parts in any orientation.

FANUC 3D Area Sensor for Bin Picking

“FANUC’s latest high-speed 3D Area Sensor is ideal for bin picking applications,” said Bernhard Walker, material handling engineer, FANUC America. “We’re showing manufacturers how easy and practical robot vision can be, even for bin picking, which has traditionally been a very challenging robotic process.”

The high-speed 3D Area Sensor provides a detailed 3D map in one quick vision shot. It’s an easy-to-use vision tool allowing bin picking setup through the iPendant in a matter of minutes. The 3D Area Sensor is available in two variants – The 3DA/1300 for a wider range of view, and the compact 3DA/400 for small to medium size applications. Both models are equipped with a higher-resolution mode for greater 3D location precision. “All of the hardware and software is designed by FANUC specifically for FANUC robots, allowing us to provide our customers a wide range of solutions to meet their production needs,” added Walker.

FANUC Intelligent M-20iA Robot Series

FANUC America’s family of M-20iA six-axis material handling robots features a compact design and class-leading reach and payload.

The six-axis M-20iA/35M robot is a variation of the M-20iA series, with a 1.81 meter reach and a 35 kg payload. A large hollow wrist offers easy routing of cables and tubes, eliminating cable management issues. Strong and rigid, the M-20iA/35M offers an enhanced wrist and higher speeds than previous models. A compact size allows it to operate in tight workspaces. The M-20iA/35M is an ideal solution for material handling, machine tending, precision cutting, or handling larger products such as LCD panels.

M-20iA key features and benefits

- Four model variations offering a 20-35 kg payload and six-axis design
- M-20iA (standard) and M-20iA/10L (long arm) offer a 20kg payload and hollow wrist for easy dressout
- The M-20iA/20M and new M-20i/35M have a 20 kg and 35 kg payload respectively, and offer a very strong, rigid wrist that allows easy dressout
- Ideal solution for handling and machine tending applications that require high wrist inertia
Compact robot fits into tight workspaces
Flexible floor, ceiling and angle mounting options
A hollow wrist allows tooling cables to be routed internally, minimizing wear and tear
Supports FANUC’s latest intelligent features including iRVision and force sensing

FANUC LR Mate 200iD Robots

The family of LR Mate 200iD robots is a versatile solution for a wide range of manufacturing operations that require access into small spaces. A very slim arm about the same size as a human arm, and a bottom cable exit option minimize interference with peripheral devices. The LR Mate 200iD robots offer a “best in class” work envelope for both upright and invert mount installations. The LR Mate 200iD robots are also available with ISO Class 4 clean-room and food-grade variants for primary (unwrapped) food handling and healthcare packaging applications.

LR Mate 200iD Features and Benefits

- Slim arm and compact footprint minimizes interference to peripheral devices in narrow spaces.
- Four to seven kg wrist load capacity with six-axis articulation.
- Best in class work envelope simplifies system layout.
- Fastest joint axes speeds maximize system throughput.
- Integrated 24VDC power, signal and air for easy end-of-arm-tool connection.
- Integrated thru-arm cable option for iRVision, force sensing, Ethernet and auxiliary axes.
- Flexible mounting (upright, invert, angle).
- High rigidity and the most advanced servo technology enable smooth motion at high speeds.
- Easy integration into machines.
- Features lightest mechanical unit in its class.
- IP67 rating allows operation in factory environments with dust and oil mist.
- New LR Mate 200iD/4SC clean-room model is ISO Class 4 (Class 10) clean-room certified for electronics, pharmaceutical and food applications. It features a white FDA compliant coating, stainless steel wrist, NSF-H1 grade grease on all joints to provide reliable performance in demanding production environments, including rigorous sanitation procedures.
FANUC iRVision

FANUC iRVision is a truly integrated, plug-and-go vision system that runs on the standard CPU of every FANUC R-30iB controller without any additional hardware. A single source solution developed and supported by FANUC, iRVision offers easy setup and operation for factory environments requiring 2D and 3D guidance, error proofing, visual tracking, and quality control – all with FANUC’s world-renowned reliability.

Next Generation R-30iB and R-30iB Mate Controller

The FANUC R-30iB and R-30iB Mate Controller use high-performance hardware and the latest advances in network communications, integrated iRVision, and motion control functions. The R-30iB Controllers feature FANUC’s exclusive and easy-to-use iPendant with 4D graphics. The iPendant displays process information and the actual process path directly on the iPendant screen, enabling easier setup and troubleshooting.

Based on the latest FANUC Series 30iB CNC Controller, the R-30iB and R-30iB Mate Robot Controllers are compact, providing customers a significant space savings. The R-30iB Mate Controller, available with a compact rack-style open-air controller cabinet, or an industrial grade standard Mate cabinet, is very energy efficient and requires less power consumption due to its availability in both single-phase and three-phase versions. The R-30iB Controller offers an optional power regeneration feature.

Dual Check Safety (DCS) Speed and Position Check Software

Prior to the application of safety rated robot software, all safeguarding of the robot needed to be external, and required a safety rated limit switch or cam system, safety rated area scanners, or other devices to limit robot travel or enhance protection. DCS safety rated robot software allows the safety design of the robot system to use the robot itself for some of the safety functions.

The most significant benefit of DCS Speed and Position Check is in applications where the travel of the robot needs to be restricted due to floor space or process limits that are less than the full reach of the robot. Restricting the robot motion in Cartesian space means the robot can be restrained to exactly the area in which it works; something that is not possible with the current systems that limit robot motion externally using limit switches.

“By moving some of the safety functions to within the robot, customers will realize significant savings in floor space, flexibility in system layout, reduced hardware costs, -more-
and improved reliability,” said Claude Dinsmoor, general manager, material handling segment, FANUC America.

In addition, safe "zones" can be enabled and disabled from an external source such as a safety PLC (based on the cell design). Designing a system with multiple zones and appropriate guarding means an operator can safely enter and leave the workspace of the robot.

“This streamlines the design of robot cells because it prevents the robot from entering the load area when an operator is present,” added Dinsmoor. This type of application is possible with existing technology, but it is typically difficult to setup, expensive to implement, and requires more floor space than a system using DCS.”

About FANUC America Corporation

FANUC America Corporation is a subsidiary company of FANUC Corporation in Japan, and provides industry-leading CNC systems, robotics, and ROBOMACHINEs. FANUC’s innovative technologies and proven expertise help manufacturers in the Americas maximize efficiency, reliability and profitability.

For more information about FANUC America Corporation, please call: 888-FANUC-US (888-326-8287) or visit our website: www.fanucamerica.com. Also, connect with us on YouTube, Twitter, Facebook, Google+ and LinkedIn. FANUC America is headquartered at 3900 W. Hamlin Road, Rochester Hills, MI 48309, and has facilities in: Atlanta; Boston; Charlotte; Chicago; Cincinnati; Cleveland; Dallas; Indianapolis; Los Angeles; Minneapolis; Montreal; Pine Brook, NJ; San Francisco; Toronto; Buenos Aires, Argentina; Sao Paulo, Brazil; and Aguascalientes, Mexico City and Monterrey, Mexico.

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