3D MACHINE VISION FOR ROBOTIC BIN PICKING

Product Overview

ROBUST ROBOTIC RANDOM BIN PICKING
Mitsubishi Electric Automation Inc.’s 3D Vision System (powered by Canon) was developed in response to the needs of the manufacturing industry, enabling customers to create and deploy a robotic random part picking solution that works quickly, accurately, and with dexterity. Employing Canon proprietary digital imaging technologies, the RV1100, RV1100P, RV500 and RV300 serve as the “eyes” of Mitsubishi Electric robots. Through cutting-edge image-recognition, data processing, and optical technologies, these eyes are capable of the three-dimensional sensing necessary to successfully identify randomly located parts within a bin or pile.

EASY TO USE YET POWERFUL 3D RECOGNITION SOFTWARE
Despite the complexity involved with locating objects in three dimensions, the software tools provided make setup a breeze. From calibration to training and validation, system setup is executed via easy to use, step by step wizards that take the guess work out of setup tasks that would normally be very complex and time consuming. The ability to simulate multiple pick orientations with user defined tooling models, combined with automatic bin avoidance technology also drastically reduces setup time by identifying potential pick issues and eliminating collision problems before they occur. With such powerful features that are easy to use means that setup costs are greatly reduced and a more robust solution can be made to maximize productivity.

KEY BENEFITS:
Flexible – Virtually unlimited number of parts can be trained; supports multiple bin configurations; networked connection for use with multiple robots
Easy to Use – Wizard driven setup (no coding required); simulate part picking with tooling
High Performance – Fast image processing; automatic bin avoidance; able to handle parts with greater levels of reflectivity
EASY TO USE
New parts registration is as easy as uploading the CAD file and taking several pictures – no coding knowledge is necessary.

SYSTEM CONFIGURATION

OPTIONS
Slide Mounting Option: Handle multiple bins by mounting the 3D vision head to a slider to measure from multiple positions.

Multi-Pallet Batch Recognition: Reduce the cycle time by placing multiple bins in the same field of view, and recognize multiple parts in one capture.

Consecutive Recognition: Reduce the recognition time by detecting the changed regions and determining if capturing is not required for the next cycle.

Partial Work Recognition: Locate parts larger than the vision head's field of view by using only part of the CAD data for recognition

External PC Library: System can run production while new part setup is in process, also allows transfer/copy of libraries between multiple vision systems

SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>RV1100P</th>
<th>RV1100</th>
<th>RV500</th>
<th>RV300</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurement Range H x W x D</strong></td>
<td>1300 x 1300 x 900 mm</td>
<td>1160 x 1160 x 600 mm</td>
<td>540 x 540 x 200 mm</td>
<td>340 x 340 x 100 mm</td>
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<tr>
<td><strong>Minimum Work Size</strong></td>
<td>50 x 50 mm</td>
<td>45 x 45 mm</td>
<td>20 x 20 mm</td>
<td>10 x 10 mm</td>
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<tr>
<td><strong>Recognition Time</strong></td>
<td>2.5 sec</td>
<td>2.5 sec</td>
<td>1.8 sec</td>
<td>1.8 sec</td>
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<tr>
<td><strong>Repeatability 3σ</strong></td>
<td>0.5 mm</td>
<td>0.5 mm</td>
<td>0.15 mm</td>
<td>0.1 mm</td>
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<tr>
<td><strong>Working Distance</strong></td>
<td>1450 mm</td>
<td>1750 mm</td>
<td>800 mm</td>
<td>500 mm</td>
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<tr>
<td><strong>Dimension of 3D Machine Vision Head</strong></td>
<td>252 x 206 x 129 mm</td>
<td></td>
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<tr>
<td><strong>Weight of 3D Machine Vision Head</strong></td>
<td>6.5 Kg</td>
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<tr>
<td><strong>IP Rating</strong></td>
<td>IP54</td>
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<tr>
<td><strong>Operating Temperature</strong></td>
<td>0 - 45°C</td>
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3D Machine Vision for Robotic Bin Picking – Product Overview

SIMPLE FLOW OF AUTOMATION
Launching the Machine Vision system into your production is easy. Setup is simple with user-friendly guided software. Simply dump the parts in a bin and hit the start button and the system searches the best pick out of the pile based on your conditions. The integrated robot picks and places the part for the next process.

1 SETUP

2 3D SCAN
Quick process

3 RECOGNIZE
Precise CAD fitting

4 PICK
With collision check along path

5 PLACE
No additional scan needed due to precise recognition

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