SMART 3D VISION FOR THE MANUFACTURING INDUSTRY

A GROUND-BREAKING SOLUTION THAT EMPOWERS VISUAL INSPECTION

3D VISION PATENT PENDING

PRODUCT SHEET

MARKET CHALLENGE

Finding the position of objects or determining their exact location in a 3D space is a challenge for current vision systems. This is especially true if we need precise positioning for further processing after the object has been picked up by the robot gripper. In addition, if the image acquisition and processing time are short enough to provide accurate data, the task becomes even more difficult.

If you want to:

- quickly insert a component onto a PCB,
- perform precision operations on elements measured in millimetres,
- assemble components with shiny or reflective surfaces, e.g. steel or metallised,

you need a proper tool to do it right!

OUR SOLUTION

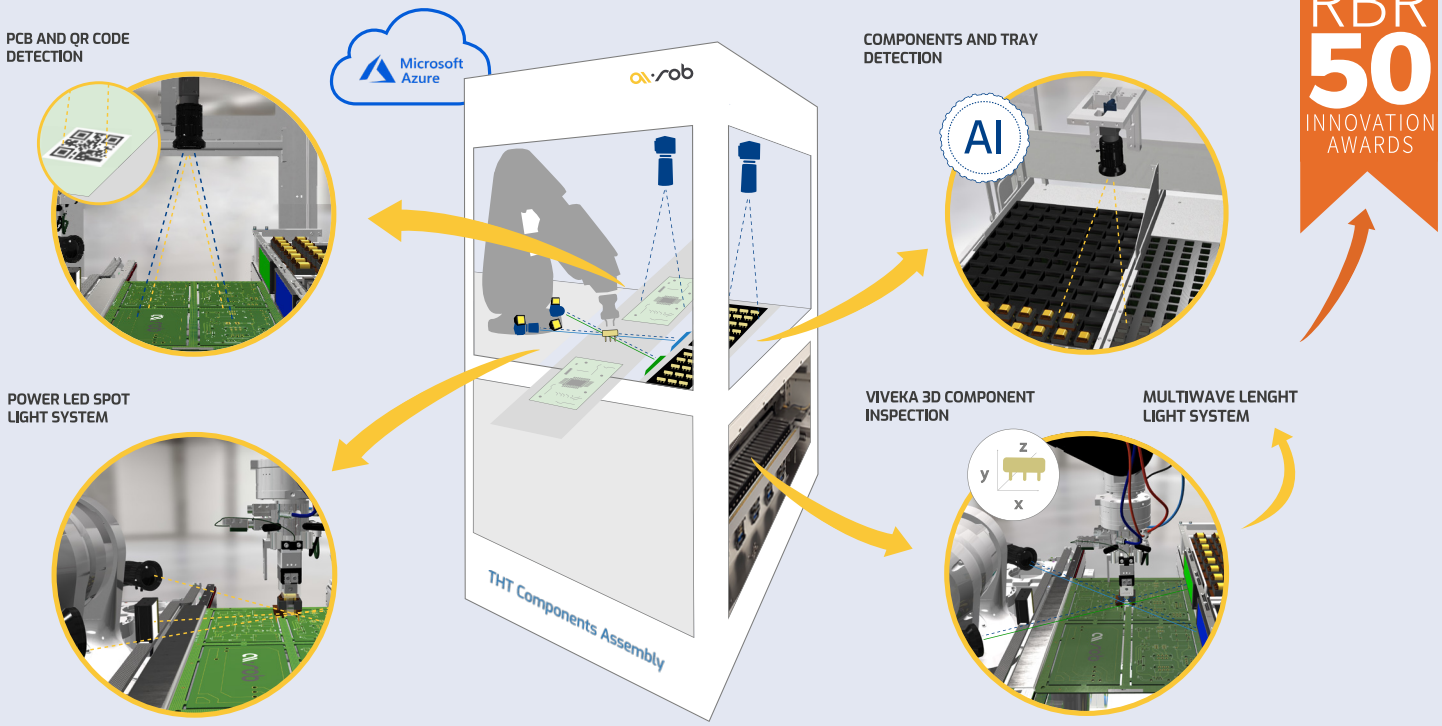
Smart 3D Vision is a powerful solution for making a quick and precise optical inspection of objects such as electronic components and their details in a 3D space. It is ready to be used in any automation projects, on various machines and for robotic applications.

Our vision system, designed to detect a component's edges and shape, reads the dimensions and the exact position of the components and their parts to achieve reliable and accurate measurement results. Viveka 3D helps your factory solve challenging applications that are often too difficult to deploy with traditional machine vision tools and require reliable, fast, precise and consistent results.

SMART 3D VISION INSPECTION PROCESS

Viveka 3D is a patent-pending solution honored by RBR50 Robotics Innovation Awards.

2022 ROBOTICS BUSINESS REVIEW RBR 50 INNOVATION AWARDS



HOW IT WORKS

1. **The Component and Tray Detection System** detects the position of the tray and the component on it to generate a trajectory for the robot and pick up the component.
2. **Power LED Spots and a Multiwave Length Light System** illuminate the work scene.
3. **The Viveka 3D Component Inspection System** inspects the component and generates the coordinates of its area in space.
   If the component does not meet the predefined parameters, it is immediately removed from the process to prevent any further errors.
4. **The PCB Detection system** checks the position of the PCB and its multi-hole pattern to calculate the exact location for the component.
5. **Image Processing Software analyses** the 3D image of the component and its final location on the PCB to calculate the most efficient robot trajectory for assembly.

Lighting plays an essential role in image quality

To meet the parameters demanded by the application without sacrificing performance, an optimised lighting solution is required. Combining a unique optical, mechanical and electronic configuration, it improves detection accuracy and maximises throughput. In multispectral imaging, illumination is particularly important as the use of a specific spectrum provides for the capture of the target, as well as characteristics sought on or about the target. Selecting and specifying the correct wavelengths and light optimisation are critical for this application.

FEATURES

- Identification of damaged and non-compliant components
- Visual inspection of parts with shiny or reflective surfaces
- 3D contour and shape analysis
- Ultra-fast acquisition and image processing
- Barcode / data code reading
- Customisable defect reports
- Inspection and review procedures

FACTS

0.02 mm.	of measurement accuracy
200 msec.	for image acquisition and processing
99,99 %	efficiency in the correct component recognition
98%	of application yield in our client's factory after the introduction of the Intelligent 3D Vision inspection process

BENEFITS

Intelligent visual inspection supports the assembly process for high-speed and efficiency, e.g. for THT components;	The industrial 3D vision system is more accurate than humans, faster and unaffected by fatigue and distraction;
Vision supports low / high-scale production, ensuring product quality and compliance with client's requirements;	Automated inspection reduces the human labour required for quality control.

APPLICATION AREAS

Smart 3D Vision solution supports visual inspection challenges in many industries:

lighting | automotive | medical | EMS | telecom | consumer and other

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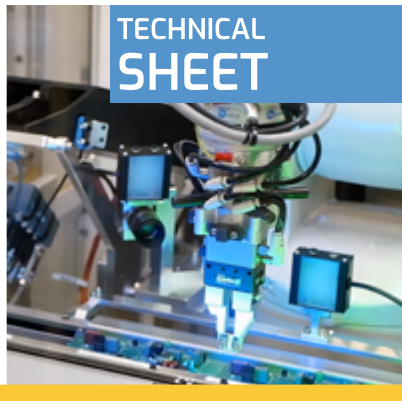
SMART 3D VISION FOR MANUFACTURING INDUSTRY

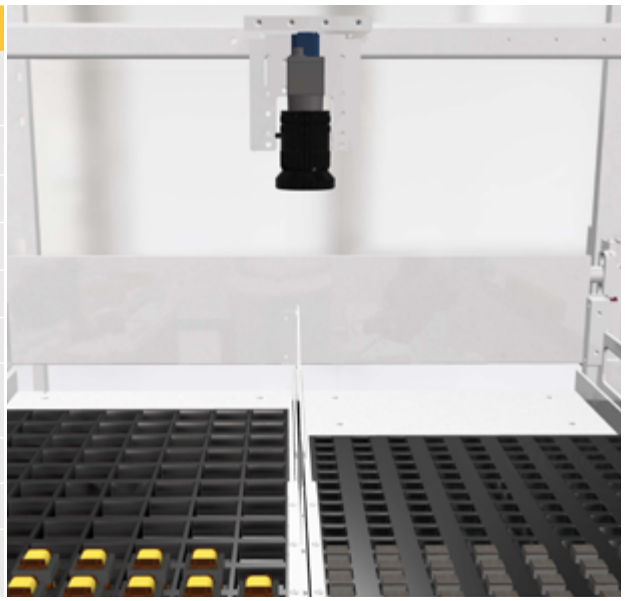
TECHNICAL PARAMETERS



TECHNICAL SHEET

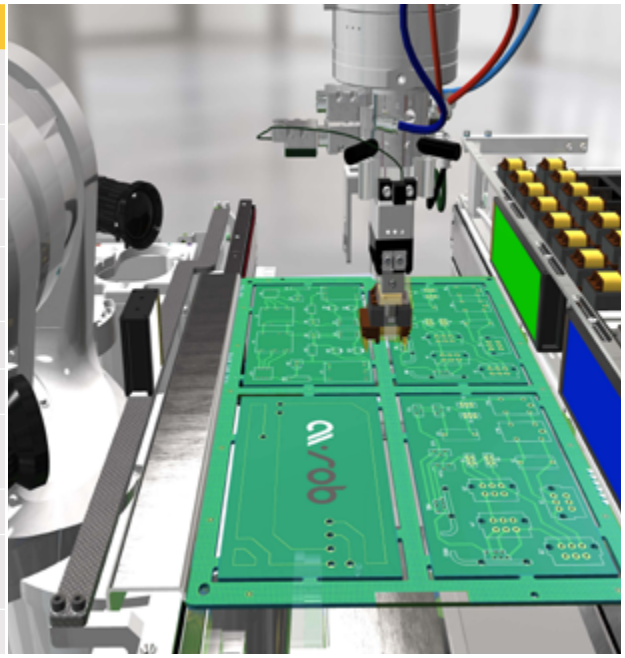
COMPONENTS AND TRAY DETECTION

Parameter	Value
Optics	1x scene camera Basler acA5472-17uc, 12 mm
Field of view	360 x 255 mm
Image resolution	20 MP
Lighting types	4x LED Barlight
Lighting colors	White
Data collection	Yes
Connectivity	Network communication RJ-45, TCP/IP
AI module	Yes
Calibration module	Yes
Efficiency in the correct component recognition	99.78%



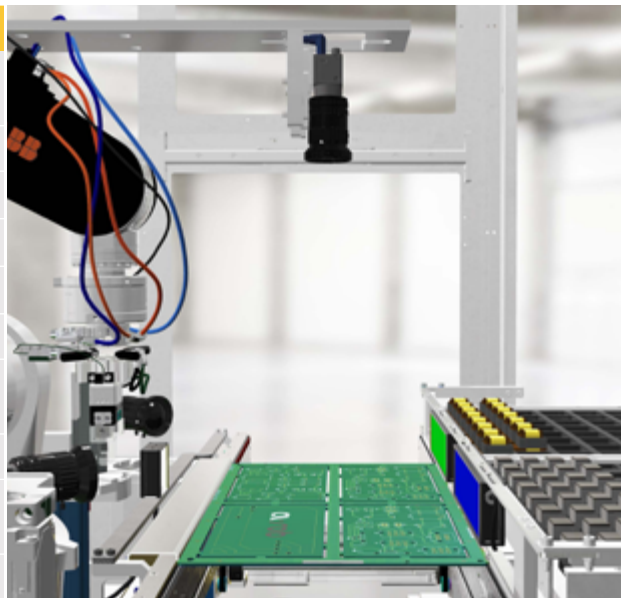
VIVEKA 3D COMPONENT INSPECTION

Parameter	Value
Optics	2x camera basler acA3088-16gc, 25 mm
Field of view	Width 60 mm x length 60 mm height 40 mm
Image resolution	2x 6,4 MP
Lighting types	3x power LED SPOT, 2x color LED backlight,
Lighting colors	White, multiple wavelengths,
Data collection	Yes
Connectivity	Network communication RJ-45, TCP/IP
Calibration module	Yes
Efficiency in the correct component recognition	99.99 %
3D measurements accurate	0,02 mm



PCB AND QR CODES DETECTION

Parameter	Value
Optics	1x scene camera basler acA5472-5gc, 35 mm
Field of view	250x400 mm
Image resolution	20 MP
Lighting types	4x LED Barlight
Lighting colors	White
Data collection	Yes
Connectivity	Network communication RJ-45, TCP/IP
Calibration module	Yes
Efficiency in correct position of PCB and QR code recognition	99.80%
Measurements accurate	0,1 mm



PROCESS FLOW

The Viveka 3D system is particularly useful if your robot application needs to determine the precise position of the product in the robot gripper after the bin-picking process. Because this is necessary for the subsequent process (machining, handling into a tester, CNC machine tool or bending machine, etc.).

PICKING BY THE ROBOT

Bin picking
Tray picking
Transport picking etc.

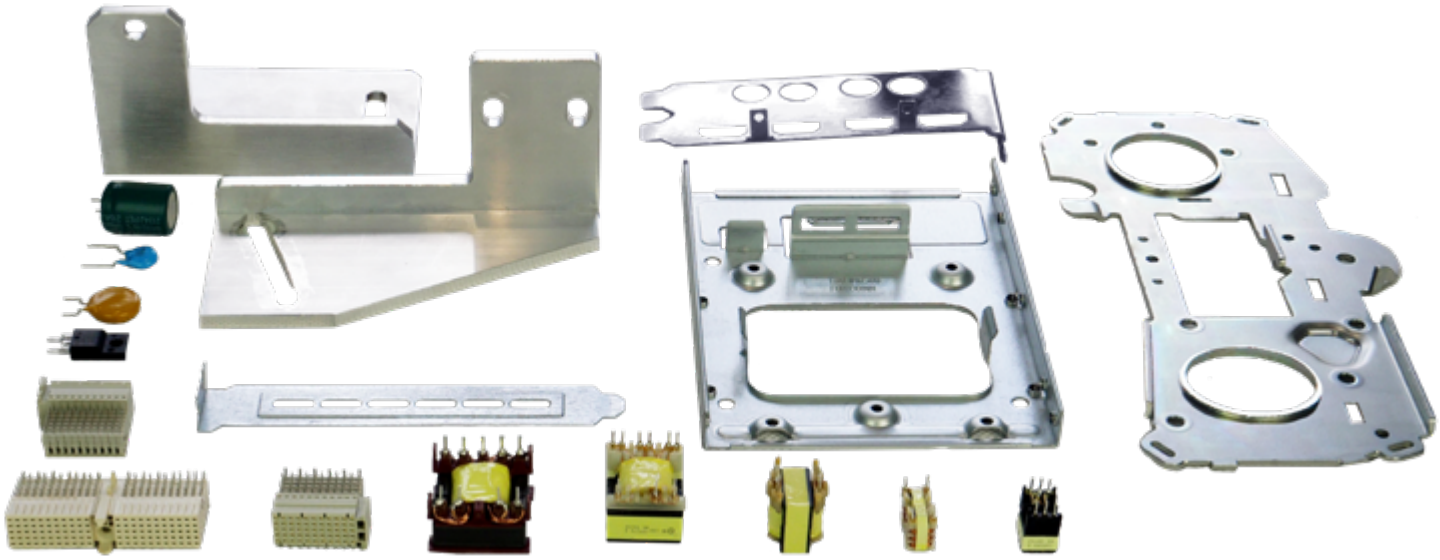
2. VIVEKA 3D SYSTEM

Determine the precise position in the robot gripper

3. SUBSEQUENT PRODUCTION PROCESS

Maschining
Tester handling
CNC handling
Bending machine handling

EXAMPLES OF PRODUCTS TO BE INSPECTED BY VIVEKA 3D VISION SYSTEM



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