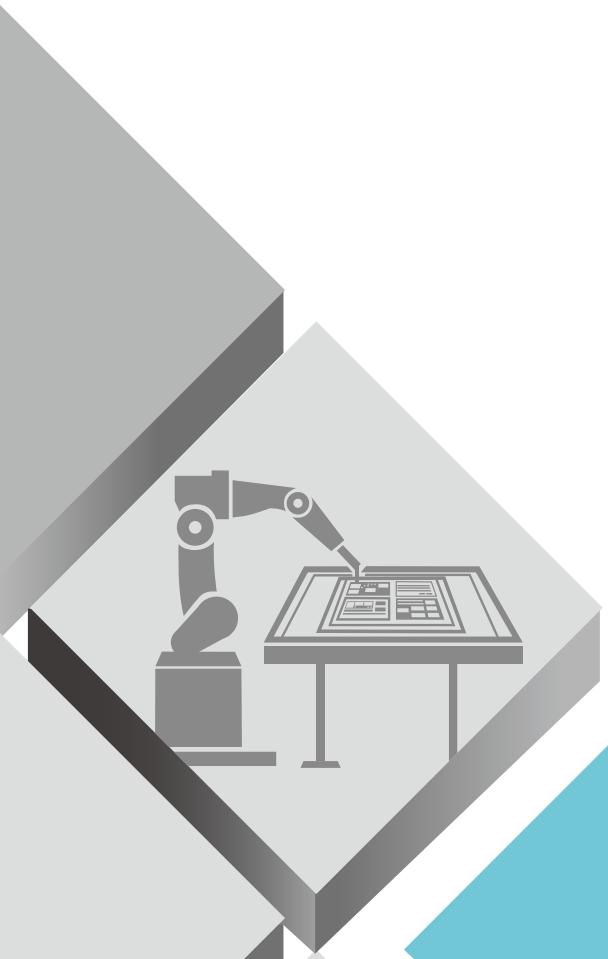
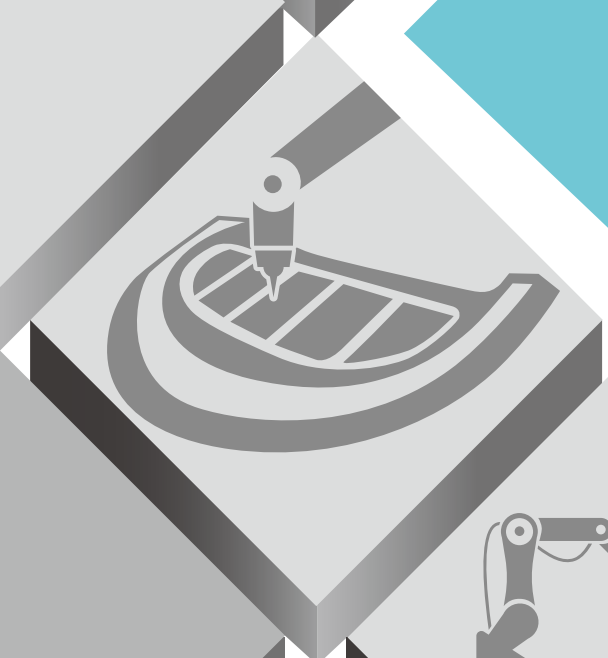
SOLOMON

Vision with Intelligence

Vision Systems DESIGN 2019 Innovators Awards GOLD





Solmotion

Vision Guided Robot Solution

- AI Deep Learning tool
- 3D vision positioning system
- Robotic path planning auto-generation
- 3D Matching Defect Inspection

SOLOMON

Solmotion

Combines 3D-Vision with machine learning
Increases manufacturing flexibility and efficiency

* The diagram is a demonstration of a car hood gluing procedure

Giving intelligent eyes to Robots

Solmotion is a system that automatically recognizes the product's location and makes corrections to the robot path accordingly. The system reduces the need for fixtures and precise positioning in the manufacturing process, and can quickly identify the product's features and changes. This helps the robot to react to any variations in the environment just as if it had eyes and a brain. The use of AI allows robots to break through the limitations of the past, providing users with high flexibility, even when dealing with previously unknown objects.

Solomon's AI technology combines 2D and 3D vision algorithms, alternating them in different contexts. Through the use of neural networks, the robot is trained not only to see (Vision) but also to think (AI), and move (Control). This innovative technology was honored in the Gold category at the Vision Systems Design Innovators Awards.

In addition to providing a diverse and flexible vision system, Solomon VGR supports more than twenty world-known robot brands. This greatly reduces the time and cost of integrating or switching different robots, giving customers the ability to rapidly automate their production lines or quickly move them to a different location. This makes Solomon VGR a one-stop solution that provides system integrators and end-users with a full range of smart vision tools.

Through a modular and intelligent architecture, Solomon VGR can quickly identify product changes and make path adjustments in real-time, regardless of any modifications made to the production line. This results in a more flexible manufacturing process, while improving the production environment to become a zero mold, zero inventory smart production factory.

Why Solmotion?

- Cuts mechanical tooling costs
- Saves the costs of fixture and storage space
- Reduces changeover time
- Decreases the accumulated tolerance caused by placing position or fixture

Solmotion

Solomon VGR blends 3D vision and machine learning to enhance manufacturing flexibility and productivity

Product Core Structure

Vision

- 3D Structured Light
- Time of Flight (ToF)
- Active Stereo Vision
- Laser Scanning

Applications

- Cutting
- Milling
- Riveting
- Welding
- Gluing
- Drilling
- Grinding
- Painting
- Inspecting
- Polishing
- Cladding
- Edge Trimming

Robot

20+ Robot and PLC brands

UNIVERSAL ROBOTS · Kawasaki · STÄUBLI · YASKAWA
mecademic · DENSO · ABB · KUKA · FANUC
MITSUBISHI · NACHI · DOOSAN · OMRON
TOSHIBA MACHINE · OTC · YAMAHA
AUBO · TM · EPSON · rethink robotics

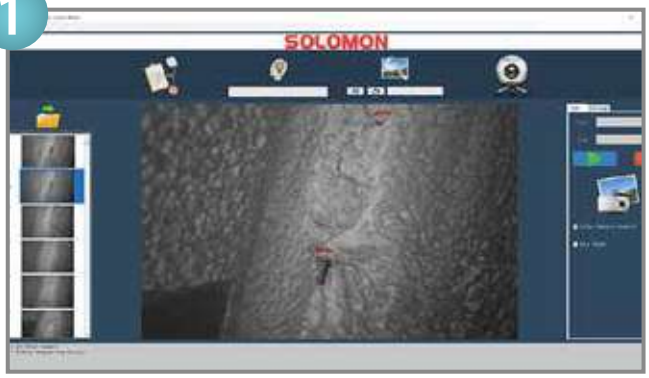
Rockwell Automation
MITSUBISHI
SIEMENS
OMRON

The Solomon AI Smart Engine acts as the brain of the robot giving it human-like sensibility and object recognition capabilities. Using a single solution, the user can guide the robot to perform complex movements and complete tasks that used to require multiple systems and devices to perform.

Solomon AI Smart Engine provides customers with a complete platform, which can perform neural network trainings according to the different product and application requirements. It only takes a few minutes to complete an AI training module and no complex programming is required.
With Solomon Motion, you can give AI vision to your robot NOW!

Key Functions

1



AI Deep Learning tool

Neural networks can be used to train the AI to learn to identify object features/defects on the surface. Comparing it to traditional "rule-base" AOI, AI inspection application scenarios are wider, smarter, and do not require experienced technician knowledge. Together with the Solmotion vision guided robot technology, a camera mount at robot can perform like human eyes and inspect each detail on the surface of objects.

Applications:
Painting defects and welding inspection, mold repairing, metal defect inspection, and food sortation.

2

3D vision positioning system

The objects can be placed randomly without the need for precision fixtures or a positioning mechanism. Through the use of visual recognition of partial features, AI can locate the position of the parts in space, generating their displacement and rotation coordinates in real-time, which are then fed back to the robot for direct processing. Also, to achieve flexible production, the system uses a path-loading function based on an object feature recognition function. The software can also generate the robot path through off-line programming, making it a suitable solution for Hi-Mix or Low-Volume, mixed production scenarios.

Applications: Various Robot Machine Tending Applications

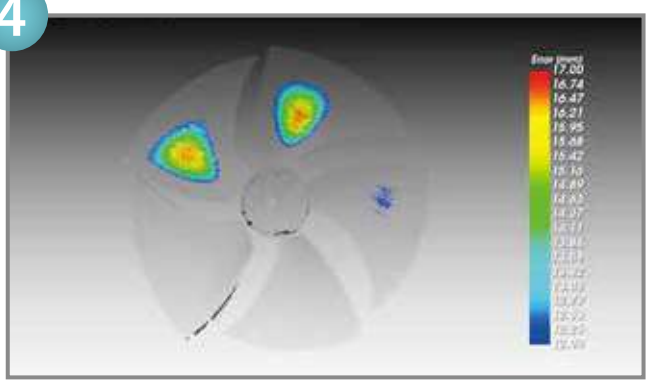
3

Robotic path planning auto-generation

There is no need to manually set the robot path, Solomon's AI will learn the edge and automatically generate the path planning. The processing angle can be adjusted to "vertical" or "specified" according to the situation. The surface-filling path generating and corner path optimization functions are also available. Supporting more than 20 robot and PLC brands; our solution is suitable for products that are time-consuming, Hi-Mix or Low-Volume, and highly variable in path teaching.

Applications: Cutting, Gluing, Edge trimming, Painting

4



3D Matching Defect Inspection

The software will perform a comparison between the generated 3D point cloud data of the object and the standard CAD in real-time, generating a report according to the pre-set difference threshold. The report will contain the differences in height, width, and volume data. This data can also be used to automatically generate the robot path. This solution is suitable for object matching and deformation compensation applications.

Applications:
Inspection, Trimming, Repairing, Milling, and 3D Printing

Solmotion

Fixture-Free or Mold-Free Processing, Smarter, Faster, More Convenient.

Applicable Industries

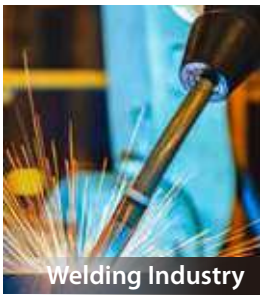
Aerospace Industry

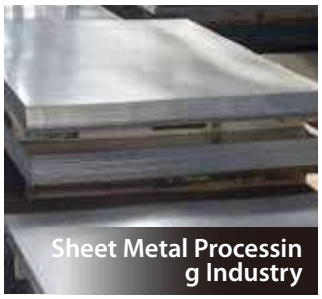
Shoe Industry

Foundry Industry

Shipbuilding Industr

Automotive Industry


Welding Industry


Sheet Metal Processin g Industry

Solomon has been deeply involved in the AI 3D Vision field for many years, showing a strong sales performance in several countries, and being deployed in many industries and applications all around the world. Solomon VGR can handle a wide array of parts as small as 0.5cm to large-scale machinery, providing complete smart manufacturing and logistics solutions and helping customers around the world to reduce manufacturing costs while improving their production process. No matter which industry it is, Solomon can satisfy your industrial manufacturing needs.

Features

- CAD/CAM software support (off-line programing)
- User-friendly path edition/ creation/modification
- Graphical User Interface, easy for editing program logic
- Project Management/ Robot Program Backup
- Automatic object recognition, and corresponding path loading
- Support for more than 20 world-known robot and PLC brands
- Automatic/manual point cloud data editing
- ROS automatic obstacle avoidance function

Product Specifications

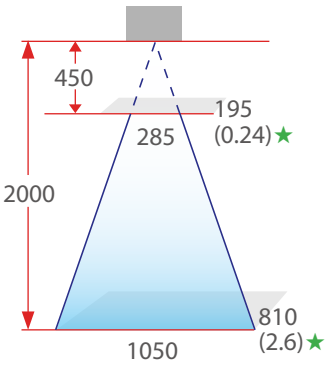
Specifications

Module Name	SLM 3DSCP-0231C	SLM 3DSCP-0501C
Pixels	2.3 M	5 M
Camera Resolution	1920x1200	2590x2048
Field of View ★★	285x195~1050x810 mm	295x220~1230x950 mm
Working Distance ★★	450~2000 mm	
Spatial Resolution ★	0.24~2.6 mm	0.15~1.8 mm
Scanning Time (Minimum)	Minimum : 0.3 Sec	Minimum : 0.8 Sec
Scanning Technology	Structured Light Projection	
Projector Light Source	LED	
Interface	USB 3.0	
Dimensions (L-W-H)	363x202x120 mm (L-W-H)	
External Power Adapter	AC 100~240 V / 50~60 Hz	
Weight	3 kg	
Operating Temperature	0 - 40 °C	

★★ can be adjusted according to the demand
★ theoretical data

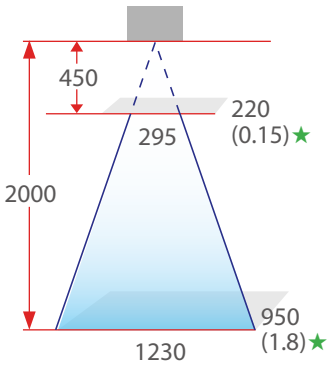
3D Scanner Field of View (FOV)

SLM 3DSCP-0231C



★ Resolution
0.24 ~ 2.6 mm

SLM 3DSCP-0501C



★ Resolution
0.15 ~ 1.8 mm

AccuPick

reddot winner 2020
best of the best interface design

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Software Requirements: Windows 10 x64
(RAM: minimum 16GB, 32GB recommended)

Hardware Requirements: GPU: NVIDIA GTX 1070 or higher
(≥8GB VRAM recommended)

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