



RESANA
Resana Engineering Art Collection





Design and Implementation of Artificial Intelligence
for Monitoring and Controlling Industrial Processes

TABLE OF CONTENTS

About Us	1
Applications	3
Projects	7
Our Customers	13
Contact Information	14



ABOUT US

Resana Engineering Art Collection

ABOUT US

Resana Engineering Art Collection was founded in 2013, with the purpose of providing technical-engineering services. The engineers of this collection have been actively working in the country's industry since 2007, then in 2013, the company was founded.

Resana Engineering Art Collection builds systems based on AI (Artificial Intelligence) and electronics for identification, measurement, tracking, counting, monitoring, and industry and design process control. Resana Engineering Art Collection is always striving to provide the future needs of the country by presenting new ideas and focusing on product quality and reliability.

The capabilities of our experts include:

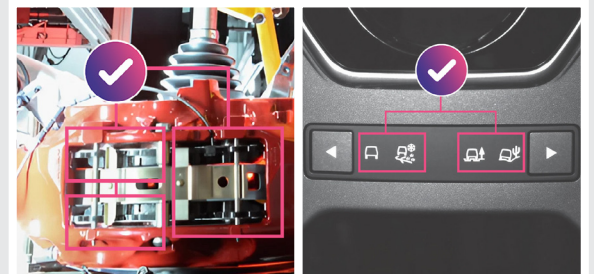
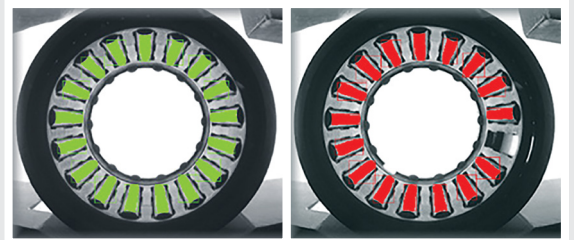
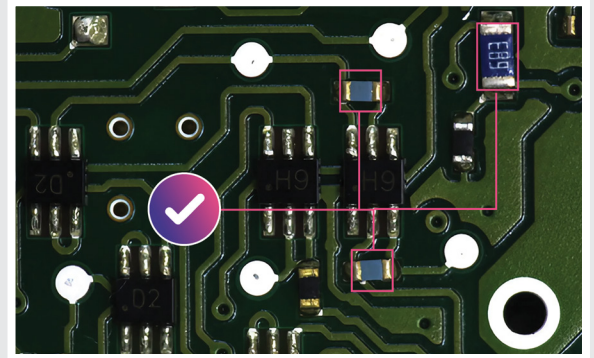
- Single and multi-camera machine vision systems for inspection, counting and automatic quality control
- Supplying industrial automation parts, electronics, machine vision systems, software, camera, lens and related accessories
- Training machine vision, electronics and programming
- Design, consultation and implementation of industrial automation projects (line automation production and machinery, SCADA and supervisory systems, etc.)
- Design and manufacture of electronic products

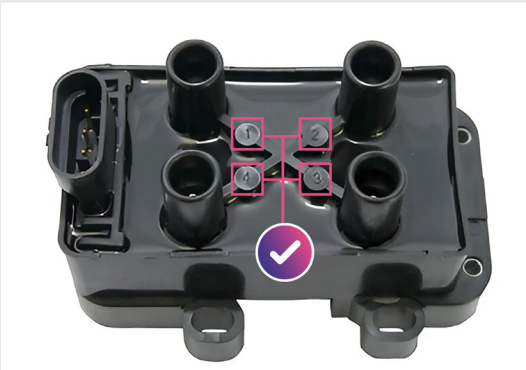
Our experts in the field of industrial rendering, design with 3D CAD controls with PLC, electrical and electronic design, factory automation and project management, allow us to complete a full scale of projects, from the supply of accessories to the complete execution of industrial automation projects.

APPLICATIONS

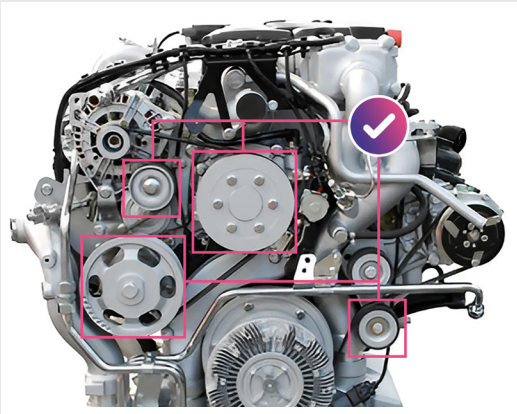
Confirmation of Attendance

- Thoroughly examining soldering quality to identify and rectify any improper or redundant soldering, as well as verifying the presence and alignment of components.
- Scrutinizing the size, position, shape, and overall characteristics of each part to ensure their proper installation.
- Conducting comprehensive inspections across all production line segments to prevent any omissions in part installation.
- Verifying the correct placement of clamps, screws, springs, and other components.

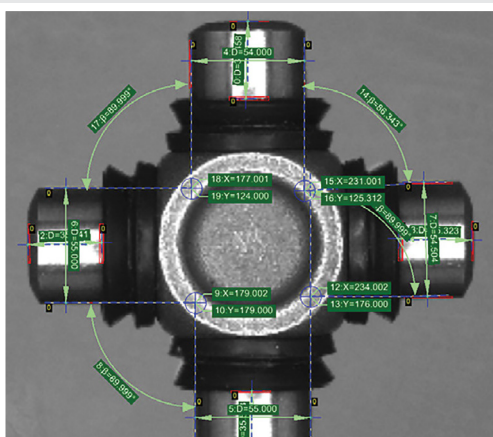




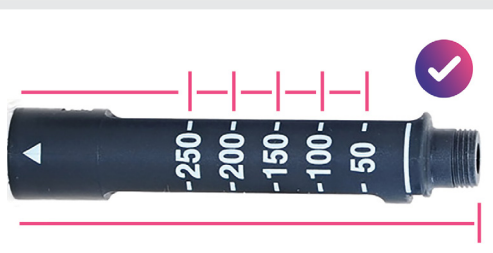
- Assessing injection molding parts and components for waste, excess streaks, and dimensional accuracy.



- Employing precise edge detection and contour analysis to ensure adaptability and accurate measurements.

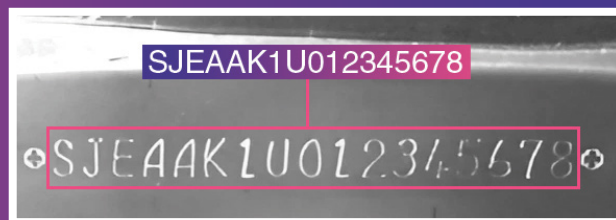
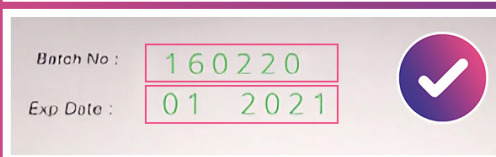
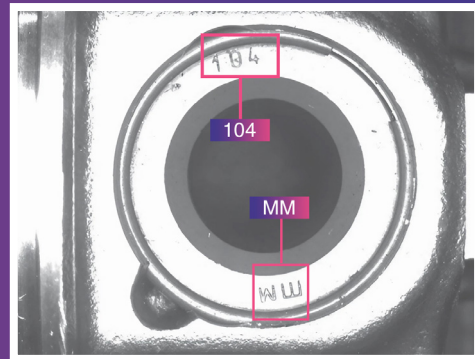


- Harnessing the capabilities of machine vision technology, we achieve rapid and highly accurate measurements of complex parameters. This is enhanced by our seamless integration of real-time calibration, which not only ensures precision but also simplifies the setup process, resulting in efficient and expedited measurements.



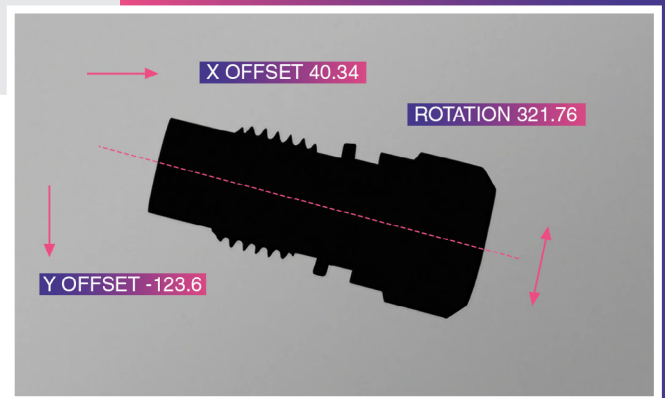
Text Recognition / Optical Character Recognition (OCR) / Analyze

Sometimes in the industry, it is necessary to carefully check and confirm the shape, size, numbers, letters, logos and signs. With vision systems, typewritten, stamped, printed or pre-printed text in all languages, typefaces, fonts, sizes and styles can be analyzed and checked. Products with marks and printing on pads, forms, labels on paper, metal or plastic, all can be reviewed and analyzed using the latest capability of machine vision systems based on Artificial Intelligence.



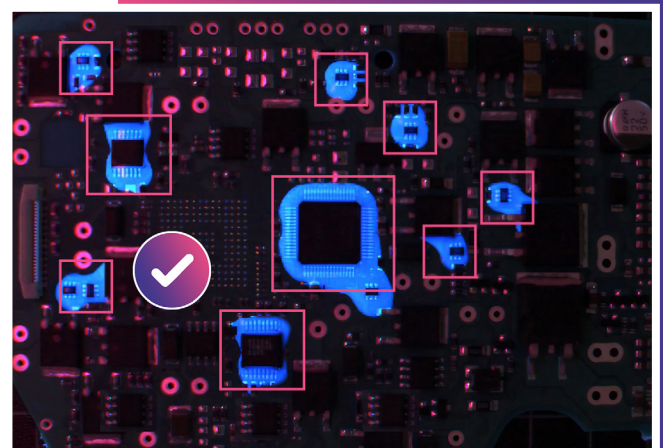
Robot Position Adjustment and Control

Positioning of parts for guiding robots, aligning products and measuring position are accurately determined. Accurate alignment and 360° rotation and axial offset provide a reliable control process.



Color Matching and Confirmation

By adjusting the color, it can be used to divide and analyze the results that work in RGB and HSI. Labels, features, covers, beads, food products, organic products and parts are checked for accurate color analysis.





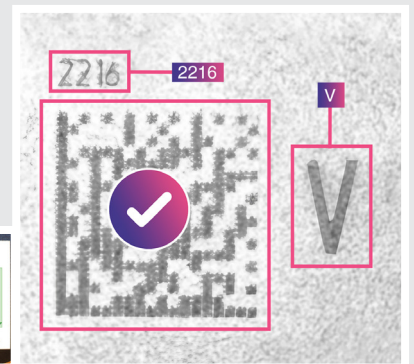
PROJECTS

Resana Engineering Art Collection

PROJECTS

Barcode and Data Matrix Reading

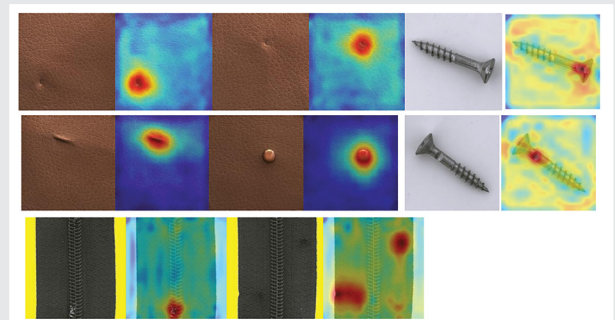
All the most common barcodes and data matrix codes can be read in any direction at high speed.



Fault Diagnosis

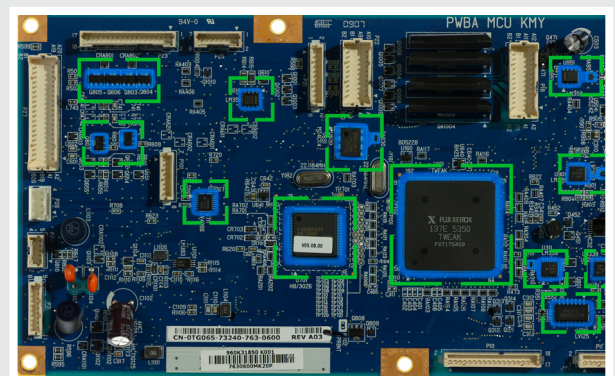
In relation to detecting faults in materials such as metal and leather, using image processing, we can identify defects present on the surface of leather, such as cuts, scratches, protrusions, or adhesive issues, and on the surface of screws, faults like cuts and wear, as well as on zippers, issues such as damaged gears and fabric corrosion, and anything else considered as a defect.

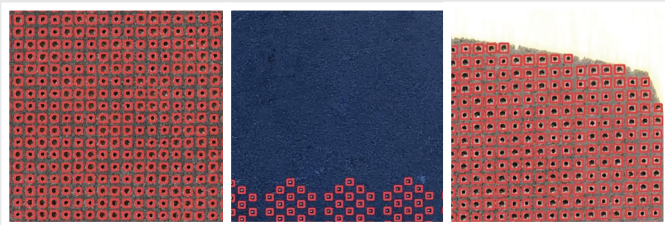
After finding the defect, the type of defect and the degree of defectiveness of the part are determined based on the defined index, for example, the surface of the section is a defect of the cut type.



Finding Parts on the PCB

In this project, the number of parts on the electronic board is counted and the number of elements such as capacitor, resistor, etc. are separated and checked. Finally, the quality of the electronic board is measured in terms of soldering and used elements. And if there is a defect on the board, the location and extent of the defect will be announced.





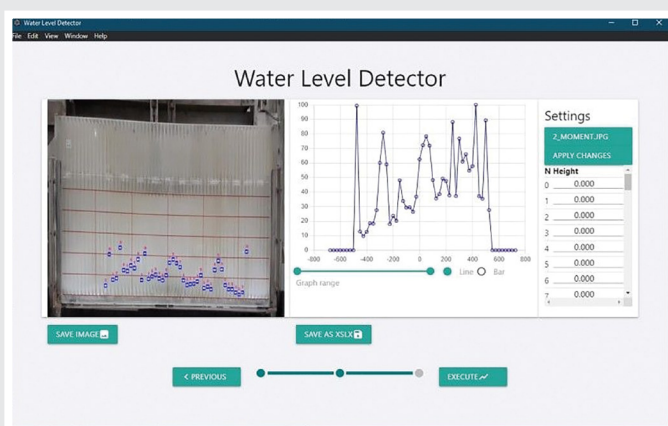
Determining the Quality of Fabric Drilling

In this project, in order to determine the quality of a fabric, all the holes on the fabric are found and checked to see what percentage of these holes have been drilled correctly, and if there is a defect on the fabric, the amount of it is specified.



License Plate Reader

In this project, all the cars in the picture are found and their license plates are read. This project is used for traffic control, to know which cars have entered the parking lot and which cars have left, and to control the passage of cars. It also has the ability to be used for speed control.

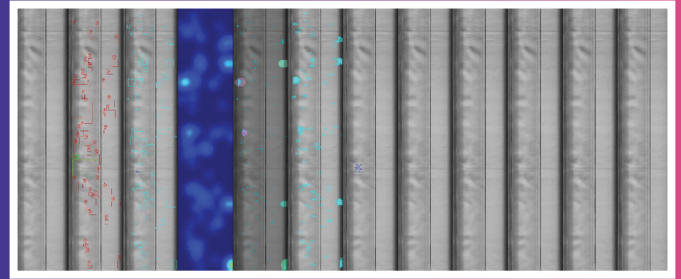


Liquid Level Measurement

In this project, a computer program has been created that receives images related to pipes and then measures the water level with an accuracy of 3mm using Artificial Intelligence algorithms. It is also able to provide an output in Excel file format, which is the final report of the density and height of water. The final program can be installed on Windows and Linux operating systems.

Glass Quality Measurement

In this project, by using image processing and artificial intelligence algorithms, all the defects on the surface of glasses in the production line are found and measured. This ability is used for quality control of the products.



Implementation of CANopen

This project is related to the CANopen protocol. This protocol is used in various industries such as automotive and has many capabilities. There are many standard details related to the CAN protocol and we were able to turn these details into a library that can be run on all microcontrollers.

TRACE	ID	DLC	DATA 0	DATA 1	DATA 2	DATA 3	DATA 4	DATA 5	DATA 6	DATA 7	TIME STAMP (msec)	TIME DELTA (msec)	COUNTER
Sx	0x83	8	0x00	0x10	0xFF	0x11	0x22	0x33	0x44	0x55	683.4303	0	1
Rx	0x183	6	0x00	0x00	0x00	0x00	0x0C	0x1A			1430.1553	0.020	24891
Rx	0x703	1	0x05								1429.7562	0.051	877

FORMAT	ID	DLC	DATA 0	DATA 1	DATA 2	DATA 3	DATA 4	DATA 5	DATA 6	DATA 7	PERIOD (msec)	REPEAT	TRANSMIT
HEX	601	6	2B	17	10	0	53	3			0	0	Send
HEX	601	6	2B	10	1B	5	1E	0			0	0	Send
HEX	601	4	40	00	1a	1					0	0	Send
HEX	601	4	40	14	10	0					0	0	Send
HEX	601	5	2F	03	10	0	0				0	0	Send
HEX	0	2	1	1							0	0	Send
HEX											0	0	Send
HEX											0	0	Send
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HEX											0	0	Send

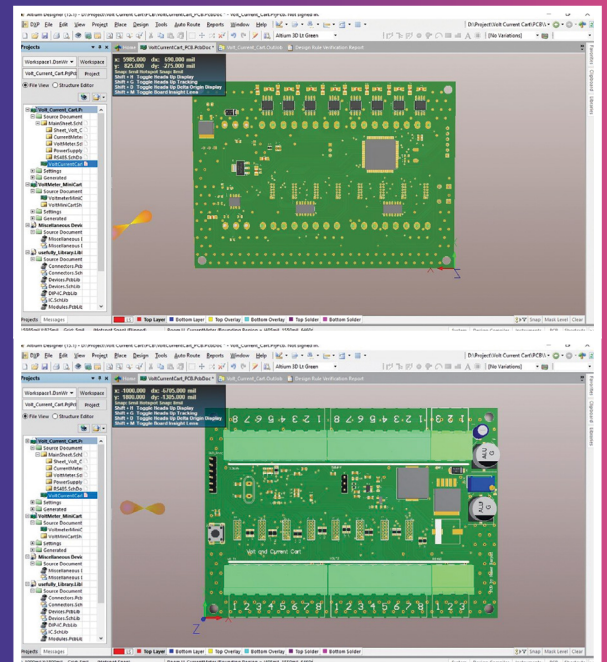
Internal Pressure Control of Tank

In high-temperature furnaces (or hardening furnaces, heat treatment furnaces), it is essential for gas to be injected into the furnace to purge the air. Therefore, there must be a slight pressure differential between the gas inside the furnace and the external environment. In this project, a gas pressure controller has been designed to regulate this pressure differential between the furnace interior and the exterior.



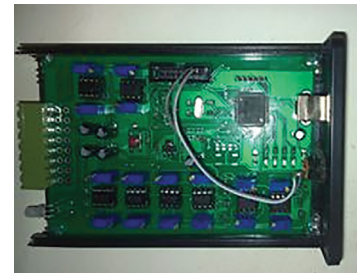
Data Card

This card has the ability to read different types of DC and AC voltages as well as alternating and constant currents and this information is available through the Modbus protocol.



Control Card

This process card is designed and made using ARM microcontroller. Also, a dedicated library in SIMULINK has been designed for it. It has four ADC channels and two DAC channels, designed and built to perform digital control tests in the SIMULINK environment.



Equipping the Laboratory with Precision Instruments

In this project, the precision instrument laboratory of Rafsanjan University has been equipped, among the collections of this laboratory are surface control set and encoder set.



Temperature Control of Ghadir Mihan Aluminum Company

In this project, using PLC and HMI of DELTA company, the electroplating department of Ghadir Aluminum Company, which is one of the proposed companies in the field of production and color of various types of profiles, was made intelligent. For electroplating of profiles, it is necessary that the solution of each electroplating pool has a certain temperature. The system is for controlling, storing and displaying the temperatures of electroplating pools. Also, in case of failure, an alarm will sound and a text message will be sent to the technical manager.

This card has the ability to read different types of DC and AC voltages as well as alternating and constant currents and this information is available through the Modbus protocol.





OUR CUSTOMERS

During the period of its activity Resana Engineering Art Collection has had the honor of cooperating with various governmental and private organizations and organizations. Some of these collections include:



CONTACT INFORMATION

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