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博 视 源

Intelligent vision solution

Focusing on visual inspection and
providing high-quality solutions

Software introduction

General Visual Algorithm Platform | Detailed Explanation of Main Functions | Introduction to Features | AI Algorithm Deep Learning | 6 Advantages | Preprocessing | Case Application

Application of Algorithms

Pretreatment

Enterprise Introduction

Xiamen Boshiyuan Machine Vision Technology Co., Ltd

Software Honors

Software certificate | CNAS certification

Cooperative clients

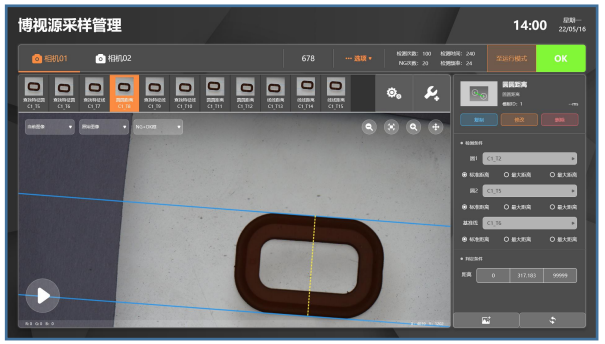
Collaboration with multiple clients

Universal visual algorithm platform

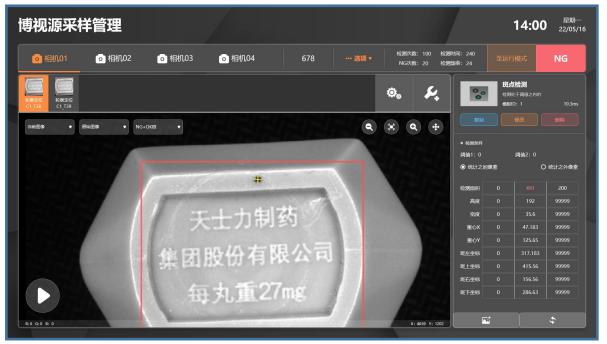
Universal Visual Algorithm Platform

The universal visual algorithm platform integrates machine vision functions that have been validated in the market for a long time, such as size measurement, dirt detection, stain/defect detection, and automatic offset positioning. Through programming by C++algorithm engineers, it can be highly matched and applicable to multiple non-standard automated devices of Boshiyuan, achieving four major detection functions: appearance detection, size measurement, visual positioning, and OCR recognition.

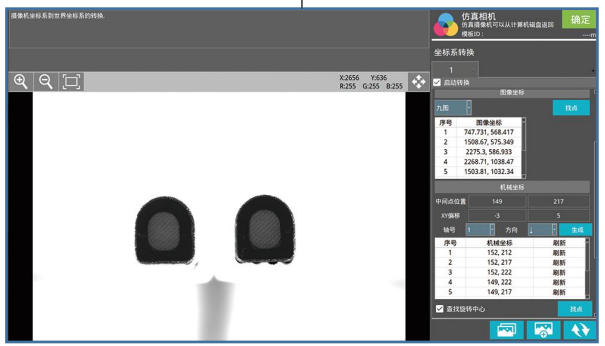
Addressing 99% of the testing needs on the market



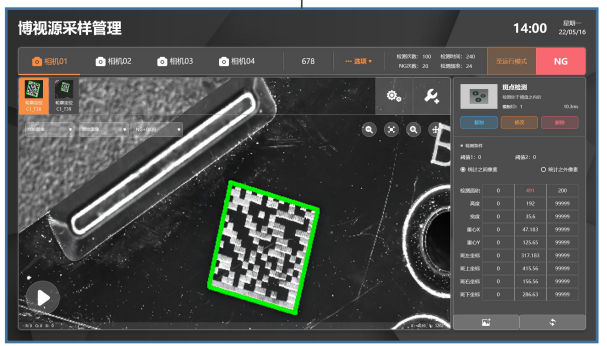
Dimension measurement



Defect detection



Visual positioning



OCR identification

Interaction between hardware and software

Rejection of defective products
Automatically reject non-conforming products when detected

Automatic swing disc
It can be linked with hardware to achieve automatic disc swinging effect

Automatic packaging
Applied to production lines for automatic packaging of products

Detailed explanation of main functions

1. Positioning function

- AI positioning
- Circle positioning
- Location filtering
- Rectangular positioning
- Contour positioning
- Circle positioning
- Insulin expansion localization
- Location grouping

Case Description — Contour positioning

Automatically recognize the product contour features within the detection area, convert them into a format that the robot can receive, and provide the robot with matching coordinate information for grasping.

2. Testing tools

- Hair detection
- Number of needle tubes
- Rubber plug detection
- Scale hair
- Number of scales
- Location grouping

Case Description — Hair detection, Spot detection

Detect hair and dirt within the blister packaging that are not clearly visible, and automatically identify and frame their positions.

3. Special identification

- 二维码
- 字符识别
- 直径判定
- OCR识别

Case Description — QR code recognition, character recognition

By visual decoding, ensure that the QR code is printed properly and verify that the content of the clear and secret codes is consistent.

4. Measurement function

- Dot distance
- Dot line distance
- Circle distance
- Point circle distance
- Line distance

Case Description — Line distance, point circle distance

Use measuring tools for the test object and determine whether it meets the specification requirements based on the measured values.

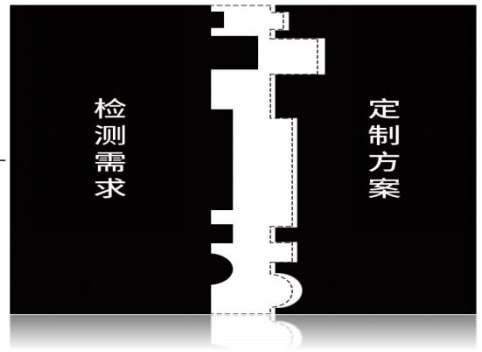
5. Counting function

- Shadow Count
- Spot count
- Edge Count

Case Description — Shadow Count, Spot Count

Determine whether the tested object has defects by identifying the number of needle cylinder engravings.

Features



Human-computer interaction optimization

In the field of Boshiyuan machine vision, software and hardware interoperability is achieved by writing code in motion controllers and modifying camera parameters. After version iteration and update, the algorithm has been pluggable, and the UI interface has been deeply optimized. With the optimization of human-computer interaction, not only does it reduce the learning cost of new software interfaces for customers, but it also significantly shortens the on-site debugging cycle for engineers.

Open source system

Boshiyuan's machine vision field integrates universality and flexibility, and has fully independent intellectual property rights. It can be adapted to the system of customer on-site equipment, such as injection molding parts, robotic arms, etc. Implement cross device interactive operations, improve work efficiency, and reduce communication time and costs between engineers and customers.

Software ⟷ Automation organization

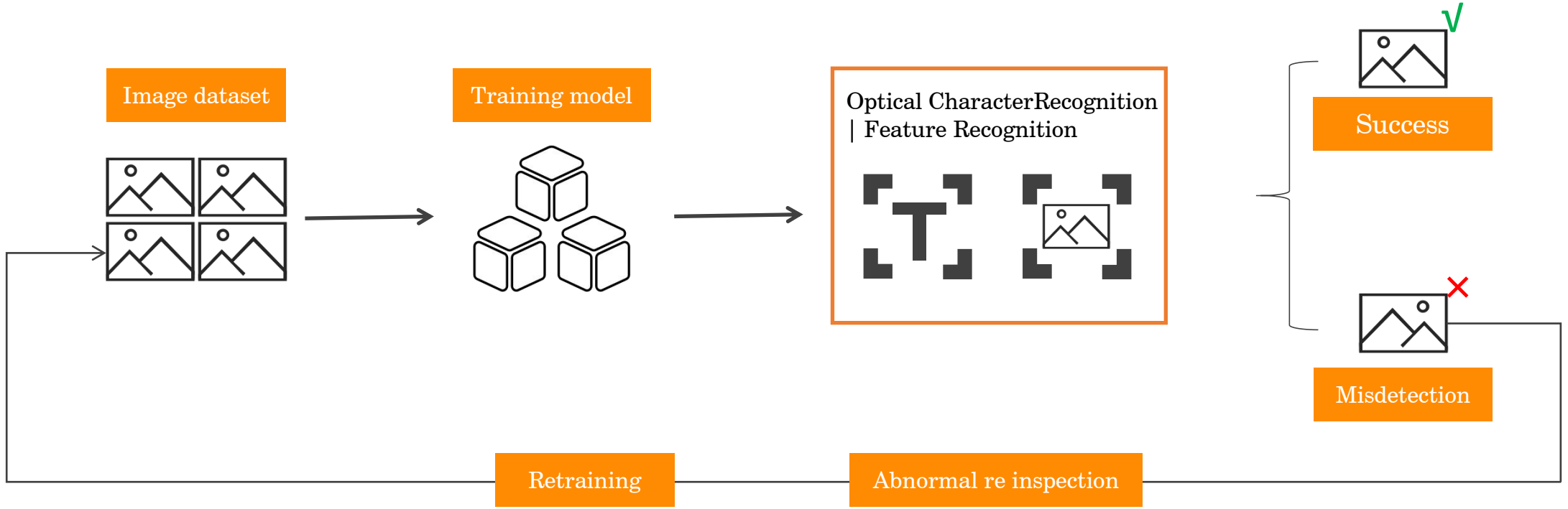
Our company has its own mechanical design department and automation workshop, and has now modularized and standardized the mechanism to achieve faster delivery time, more scientific structural design, and more stable quality.

AI algorithm deep learning

AI algorithm deep learning

Continuously reducing detection difficulty	Continuously improving detection accuracy	Continuously improving the recognition of weak features	Continuously reducing the false detection rate of abnormal features

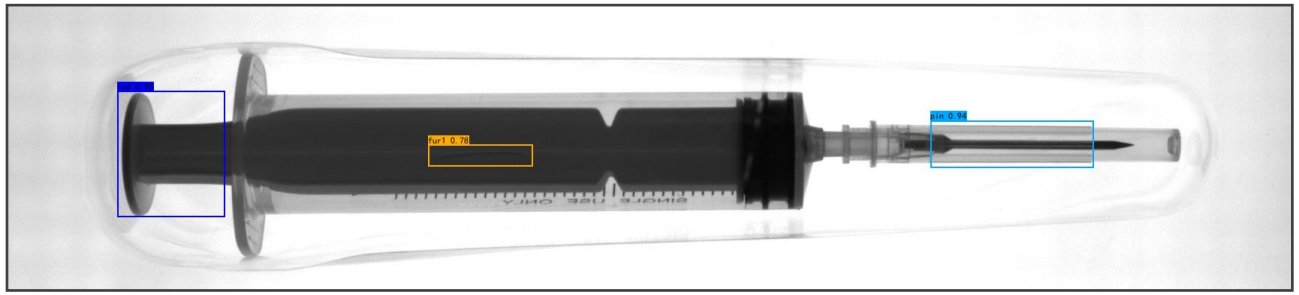
AI algorithm deep learning, with a market detection error rate of 0.0001%



AI algorithm deep learning

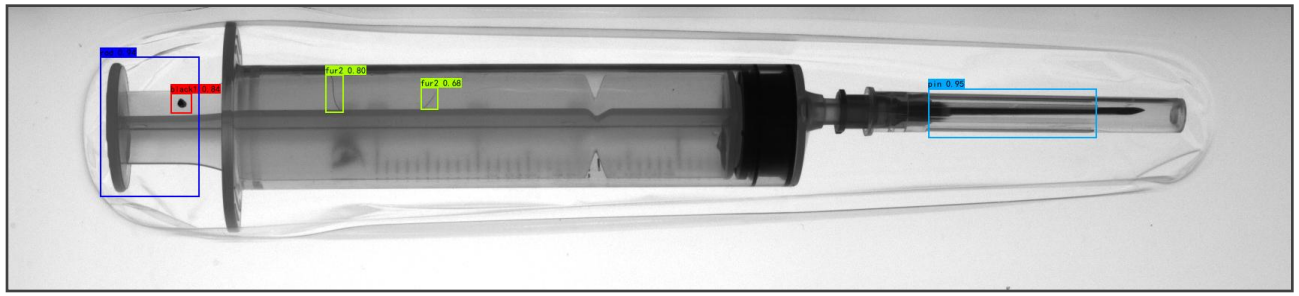
Recognition features display weak dirt and foreign objects

The AI algorithm can recognize weak dirt and foreign objects. Our company has optimized the AI algorithm and repeated the recognition training of weak features in anomaly detection, enhancing the ability to still recognize weak features of dirt and foreign objects in dark areas.



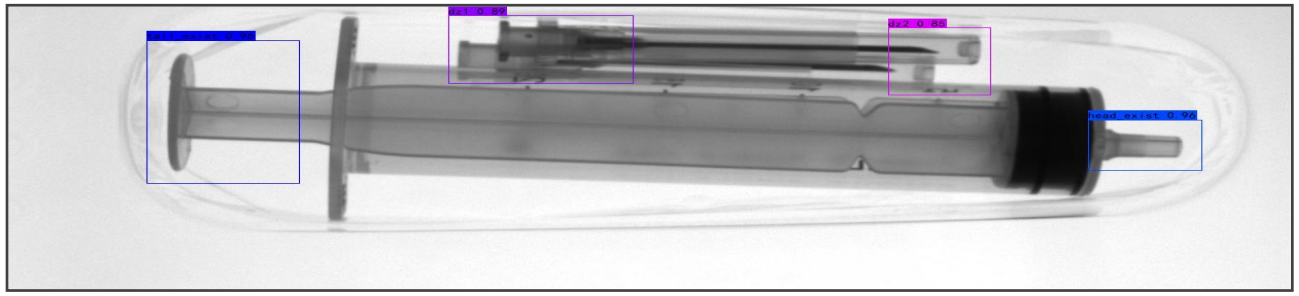
More accurate detection results

The AI algorithm can detect hair and foreign object spots in general situations. Our company strengthens the structure of the AI algorithm to enhance the detection of fine feature hair, foreign objects, and spots, significantly reducing the false detection rate and improving enterprise productivity.



Accurate recognition and easy detection of objects placed arbitrarily

Our company enhances the positioning assistance correction function in the AI algorithm, allowing for automatic and accurate identification of detected objects by placing them arbitrarily, reducing the rate of missed detections.



Core Advantages

Solve high development time costs

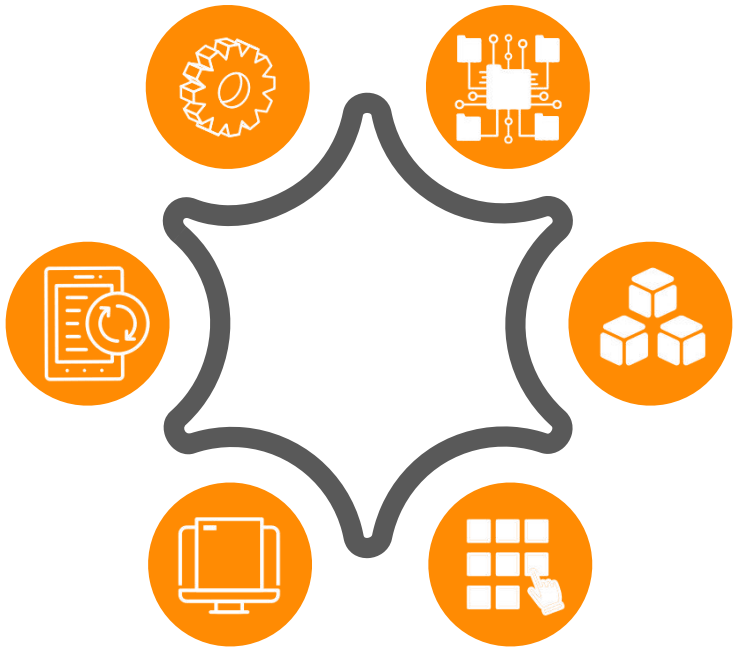
Integrated visual algorithm library with diverse software functions and low development time and cost

Resolve version fragmentation

Unified software version, universal for 90% of visual inspection needs on the market

Solution to inconsistent operation methods

Summarize user operation habits and make the operation more user-friendly



Solve multiple system vulnerabilities

Can be combined with AI algorithms to learn various false positives and continuously reduce low false alarm rate

Solve the problem of low detection accuracy and easy misdetection

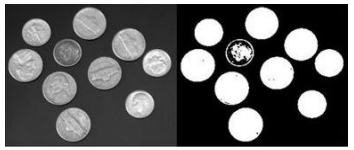
Can be combined with AI algorithms to learn various false positives and continuously reduce false positives rate

Professional settings are required to solve testing engineering problems

The operation interface is decentralized and simplified, and users can set and modify visual detection schemes themselves

Pretreatment

Fuzzy processing, Canny, closed operations, contrast, erosion, interference control, median filtering, grayscale stretching, Gaussian filtering, open operations, binarization, bright correction, linear defect extraction, spot filtering, local threshold, ROBERTS, PREWITT, etc. belong to median filtering, while Gaussian filtering belongs to low-pass filtering. The edges, jumping parts, and particle noise of an image represent the high-frequency component of the image signal, while the large background area represents the low-frequency signal of the image signal. By filtering out the high-frequency part, the noise can be removed.



Binarization

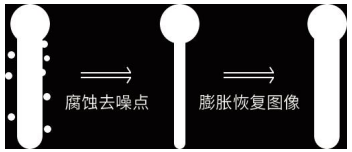
Set the grayscale value of the pixels on the image to 0 or 255, which means presenting the entire image with a clear visual effect of only black and white.

Canny edge algorithm

The edge detection algorithm significantly reduces the data size of the image while retaining the original image attributes.

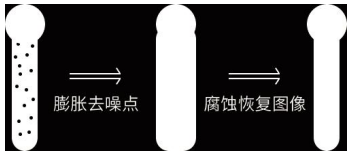
Grayscale Stretching

Also known as contrast stretching, it is the most basic grayscale transformation that uses the simplest piecewise linear transformation function. Its main idea is to improve the dynamic range of grayscale levels during image processing.



Open Operation

Corrosion before expansion can eliminate small white spots (noise) outside the image area.



Close Operation

Expanding first and then corroding can eliminate small black spots (noise) in the image area.

Roberts Operator

The image processing effect is better for images with steep and low noise. From the actual effect of image processing, the calculation is simple and the edge positioning is accurate.

Case application

Metal key detection machine

Headphone compartment QR code detection machine

Mobile phone rear case detection machine

Injection molded part cutting inspection machine

Mist head inner diameter diameter testing machine

Thread column inspection machine

Car buckle detection machine

Aluminum foil sealing infrared detector

3D laser altimeter

Die Casting Thread Testing Machine

Steel sheet appearance inspection machine

Tailored non-standard automation equipment for customers from all walks of life!

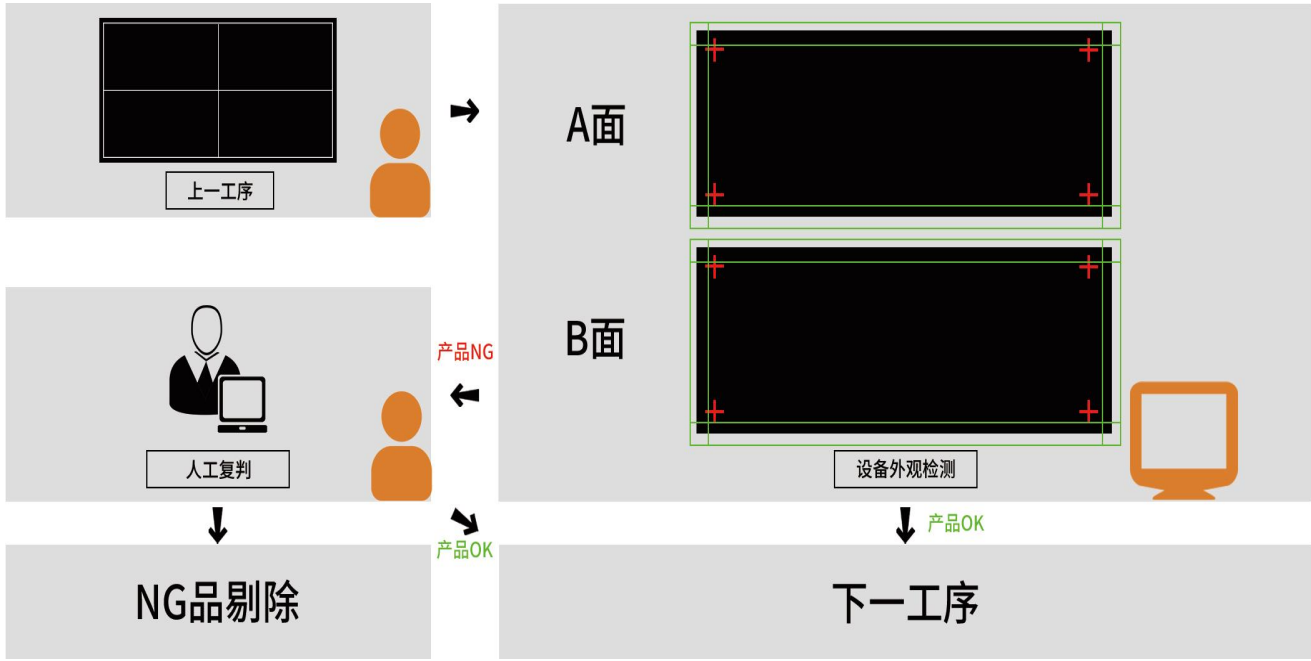
Reasonable application of AI algorithm

Edge inspection system

The edge detection system is a customized program for screen detection, which serves non planar imaging line scanning cameras. On the data side, mature detection algorithms from the universal visual algorithm platform are used to achieve precise detection of high-precision linear images.

Border patrol management software

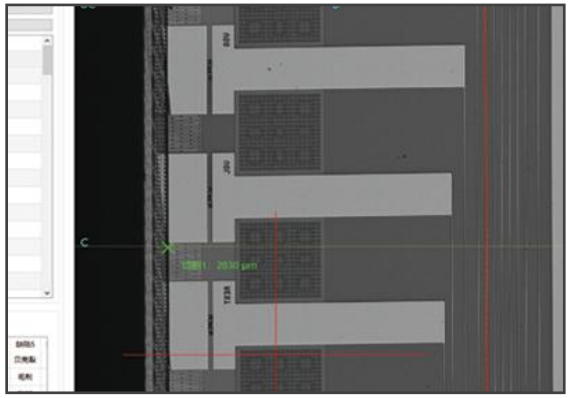
Edge inspection software



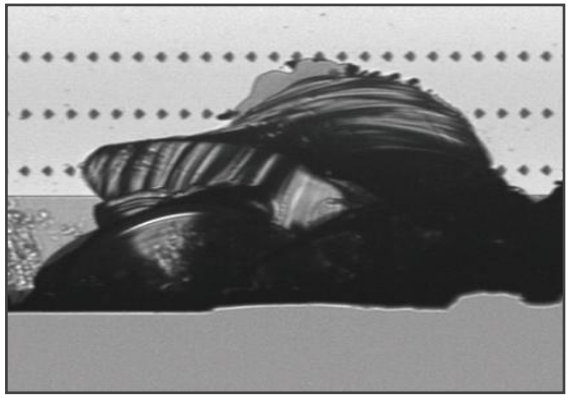
Edge patrol detection software

- The detection software is responsible for measuring the appearance and defect detection of each edge of the display panel.

Partial testing requirements

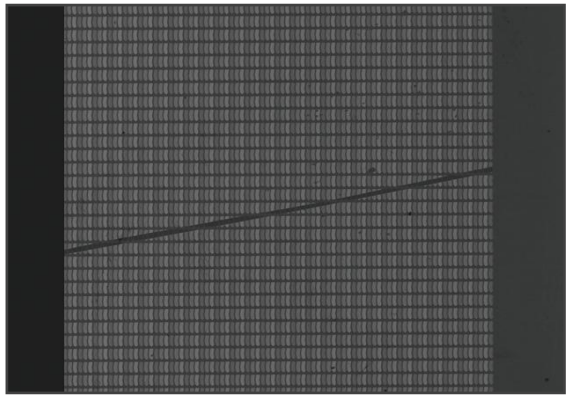


Appearance edge measurement



Shell crack

Peripheral fault



Fine scratches

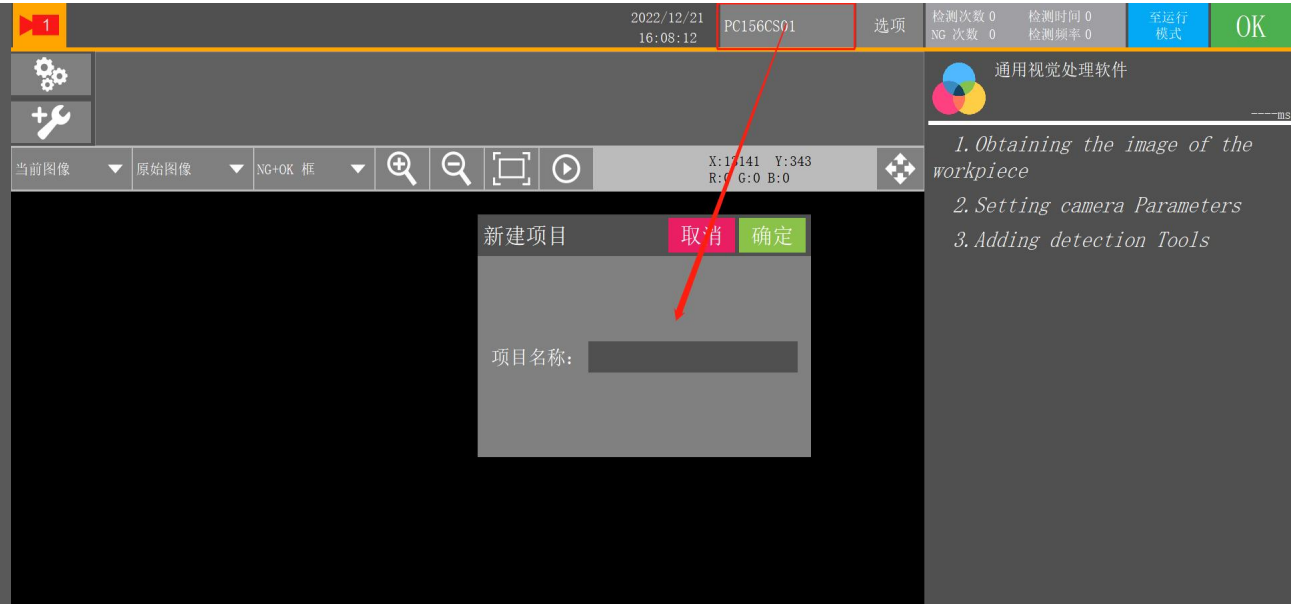
Edge patrol detection software

Core advantages

Using universal visual algorithms to detect embedded AI deep learning

The system will cut and classify linear high pixel images, which can perfectly match various mature detection algorithms of our company.

The algorithm embeds AI deep learning, and through cumulative learning of continuously generated cases, the detection accuracy will continue to improve.



1

Mark positioning

Supports precise positioning of cross mark marks of specified sizes.

2

Appearance Measurement

Support measurement of cutting accuracy and chamfering accuracy.

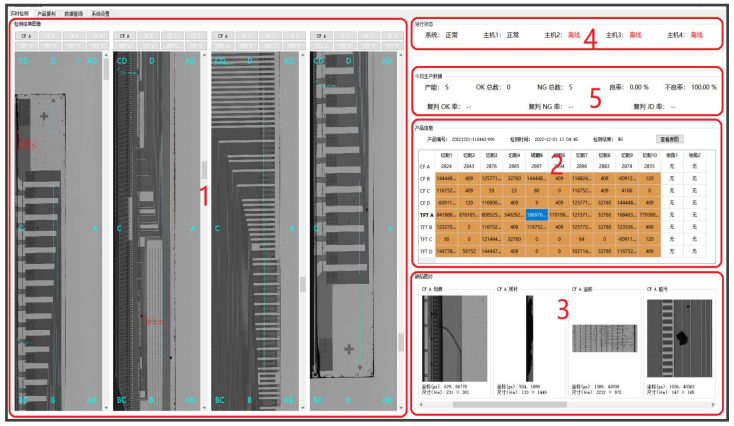
3

Viewing Historical Product Data

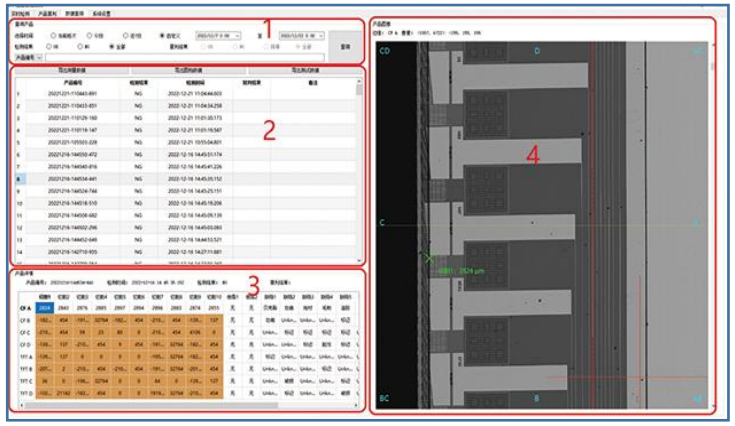
Filter and query the testing data of specified products based on production date, time period, product number, and testing results, and support the export of product drawing data.

Edge patrol management software

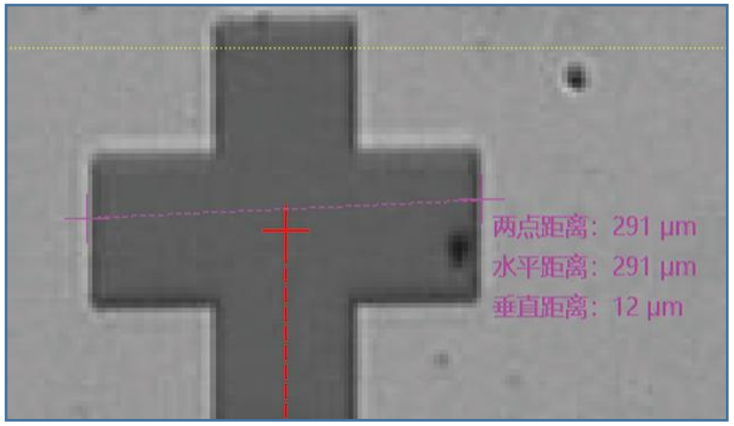
- The management software is responsible for real-time synthesis of the results of various detection software, re judgment of NG products, and data management.



Real time monitoring management



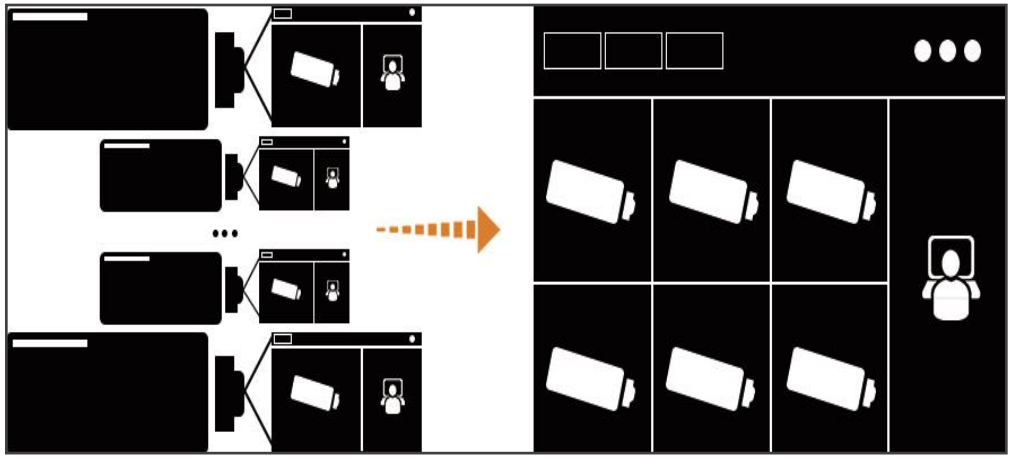
Data Query Management



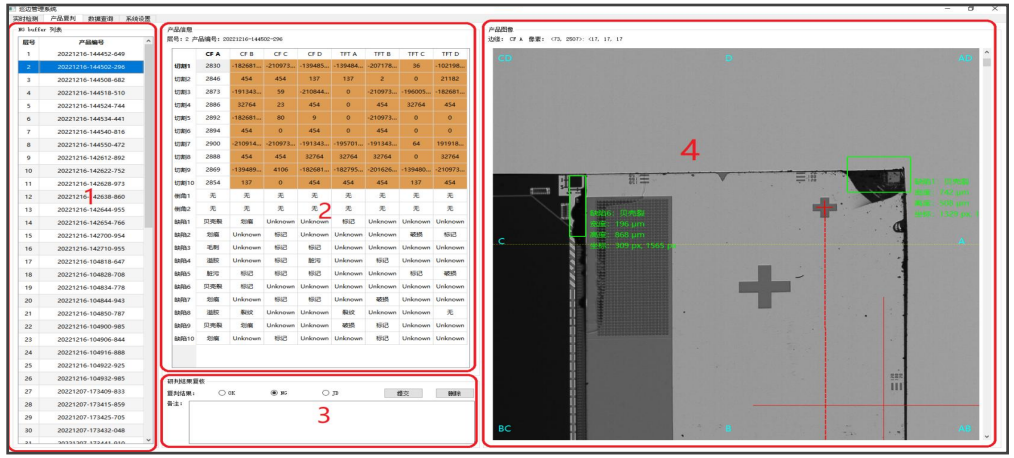
Manual measurement of distance

Edge patrol management software

Core advantages



Multi host bridging, integrating multi-party data, unified computing, and integrated port management

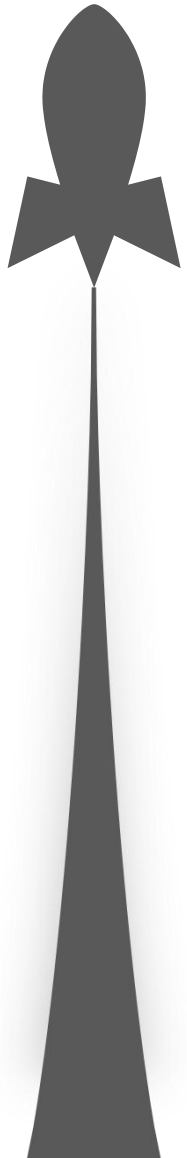


For products that have been determined as NG by the system, manual viewing and measurement of the original product drawings, manual review, and submission of re judgment results are supported.

Edge patrol management software

Other functions

- Real time inspection data viewing: Real time display of current product inspection results images, cutting and chamfering measurement data, and defect small images.
- Historical product data viewing: Filter and query the testing data of specified products based on production date, time period, product number, and testing results, and support the export of product drawing data.
- Data statistics: statistics on the production capacity and re judgment results of the day.
- Data reporting: Production data is reported to the DFS and CIM systems.
- System configuration: Configure measurement specifications and upper and lower limit parameters.
- System status management: Manage the operation status of the system, detection software, camera, and PLC, and provide fault and abnormal alarms.



AOI full inspection system

Software Introduction

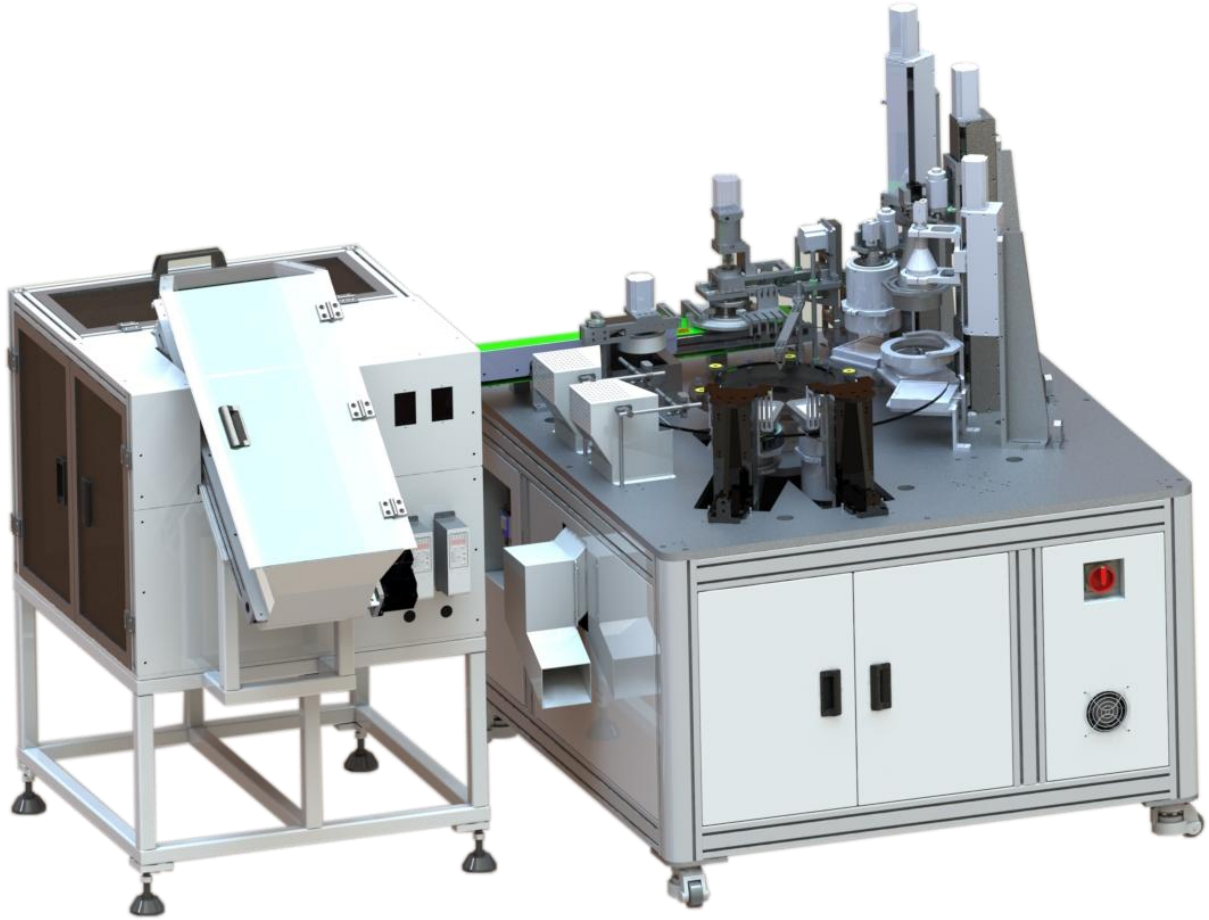
- The operation interface is decentralized and simplified, with open user permissions, allowing customers to set and modify the project themselves.
- The visual module mechanism is connected to the software to achieve visual debugging on the system.
- System networking allows engineers to remotely debug equipment.
- AI model training is online.
- The software has high compatibility with multiple types of products, and users can quickly switch between testing materials through sample management.

AOI full inspection system

Structural features of the turntable machine

Due to the permeability principle of its material, it can achieve comprehensive coverage of the appearance of six surfaces of the product when shooting with an array camera without dead angles.

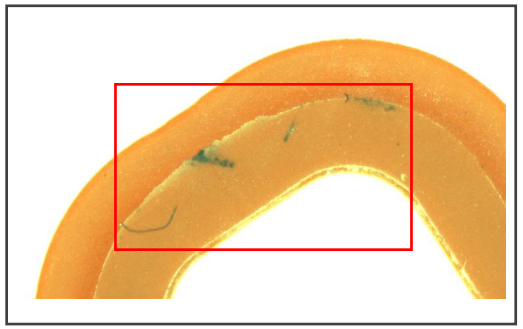
Camera installation module



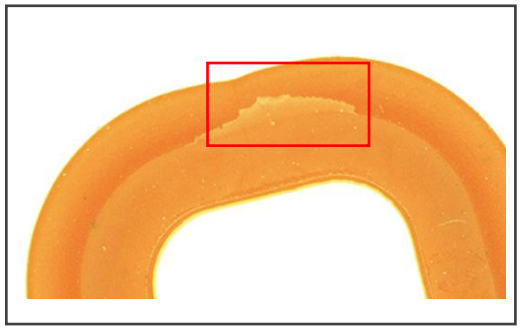
AOI full inspection system

Case Application

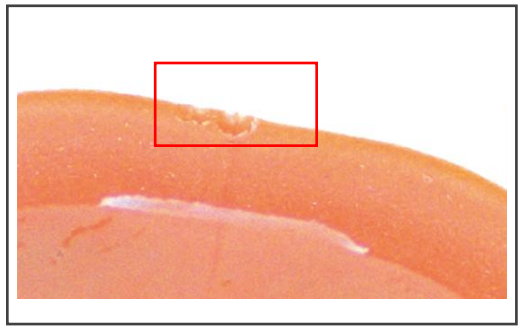
Liquid silicone testing machine



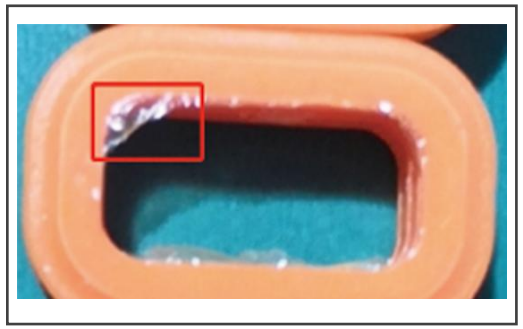
Defect type: dirty



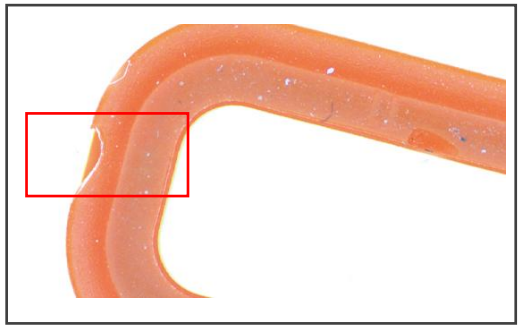
Defect type: exhaust port burrs



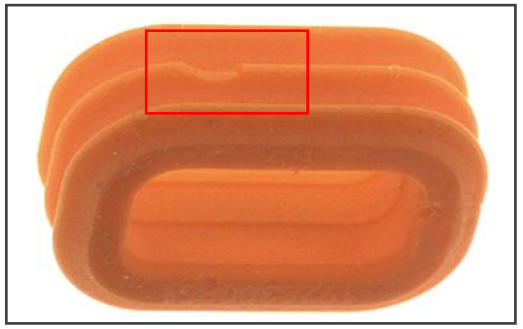
Defect type: Rib depression



Defect type: inner ring burrs

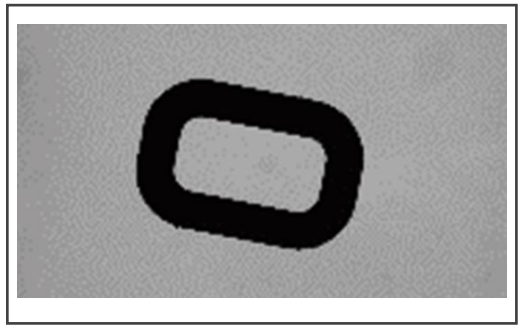


Defect type: Front notch



Defect type: Side notch

Defect type: edge pitting



Defect type: size inspection

Enterprise introduction

Xiamen Boshiyuan Machine Vision Technology Co., Ltd. is an industrial AI high-tech enterprise established in 2010. It focuses on the research and development of machine vision and AI deep learning technology products, and is committed to empowering high-end industrial manufacturing with machine vision and AI. Based on years of experience in solutions in medical, 3C electronics, hard alloys and other application fields, Boshiyuan is currently focusing on and focusing on new fields such as optoelectronic displays and semiconductors.

Boshiyuan currently has a team of over 170 people, including over 100 R&D technical teams. The core members of the R&D team mainly hold master's degrees or above from key universities both domestically and internationally. They come from well-known enterprises such as Huawei, Meiya Baike, Starnet Ruijie, and Harbin Institute of Technology. They have accumulated some experience in 2D/3D machine vision, AI deep learning, precision mechanical control, high-precision optics, and have more than 8 years of experience in the field of machine vision. The overall team configuration is at an upper level in the same field.

Boshiyuan takes standardized products+industry solution services as its business strategy, relying on the company's existing user base and the self-developed AI industrial intelligence platform's big data technology, utilizing existing marketing channels and business layout to expand new business and achieve new breakthroughs. We have now achieved 100% national coverage and 30% overseas national and regional coverage.

Software honors

Software Certificate

① Boshiyuan single-phase integrated mold monitor system v3.0.4
② Boshiyuan Single Phase Split Mold Monitor System v8.0.6
③ Boshiyuan Multiphase Split Mold Monitor System v10.0.7
④ Boshiyuan Multiphase Integrated Mold Monitor System v10.5.1
⑤ Boshiyuan Cross Flow Wind Blade Positioning and Detection System v20.4.9
⑥ Boshiyuan Mobile Phone Frame Appearance Inspection System v20.3.3
⑦ Boshiyuan Character Detection System v20.6.4 ⑧ Boshiyuan Visual Detection System v20.0.1
⑨ Boshi Yuanshi Printing Inspection System v20.45.7

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CNAS certification

Cooperative customers

Gian 精研科技 | BERPU 贝普 | CHINT 正泰集团 | LUXSHARE ICT | 三安光电 Sanan Optoelectronics | GoerTek have sound, will travel

洪达 | 通達集團 TONGDA GROUP | ERA 公元 | flex LIVE SMARTER | WEGO 威高 | 三鑫医疗 SANXIN MEDTEC

Yeso-med 宇寿医疗 | GOLDRAIN | LCE | FOXCONN 富士康科技集团 | SAMSUNG | JET BIOFIL®

Thanks You !