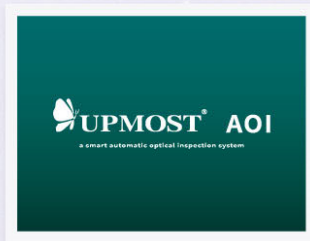




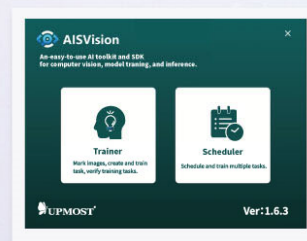
Advanced Computer Vision Solution

Computer Vision Suite AOI + AI Platform



UPMOST AOI

AOI Software with
High-Precision Image
Pre-Processing

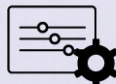


UPMOST AISVISION

Professional AI model training
software with 5 different
algorithms.



No Code
Quick Setup



Parameter-based
& Quick setup



Rapid
development



Scalable
Architecture



Multi-Functional
Module

Computer Vision Suite is a no-code, scalable vision platform designed for fast deployment through simple parameter adjustments.

Its user-friendly and efficient architecture helps reduce false positives, overkill, and missed defects—eliminating the need for programming expertise.

- **No-code & workflow-based operation:** No programming required — built on a process-driven architecture.
- **Parameter-based & Quick setup:** Configured by non-technical users through simple parameter adjustments.
- **Rapid development:** Significantly reduces both development and maintenance costs.
- **Scalability:** Built with a robust architecture for both hardware and technology expansion.
- **Multi-Functional modules:** Reusable modules significantly reduce the need for coding, testing, validation.

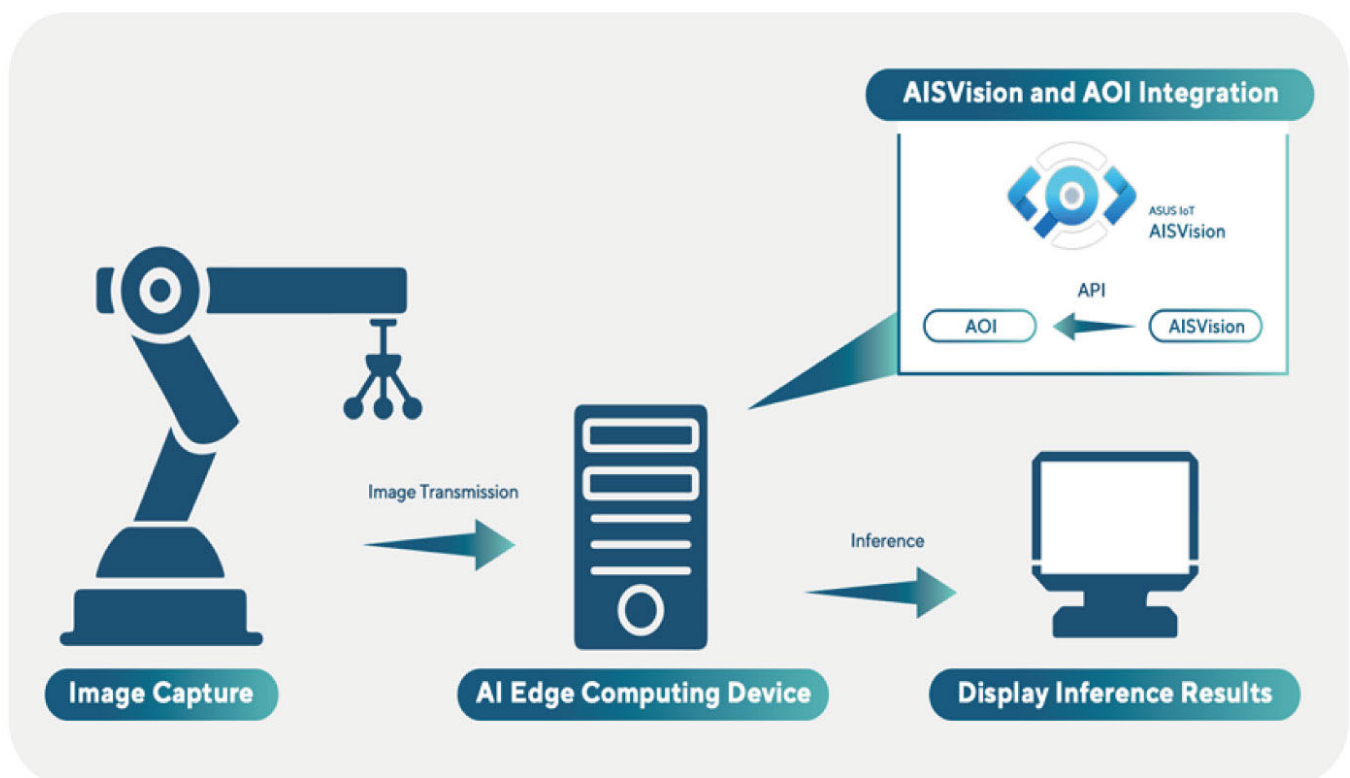
See it. Capture it. Inspect it.

See it. Capture it. Inspect it.

No matter how small or fast an object is—if the camera captures it, Computer Vision Suite can detect and recognize it.



Platform Architecture : UPMOST AOI + UPMOST AISVision



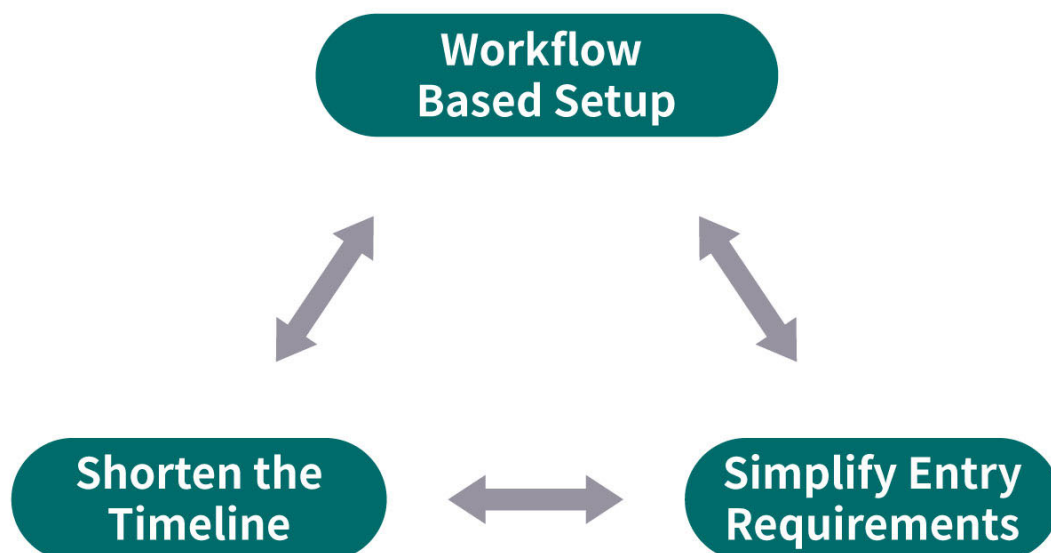
Comparison - Traditional AOI vs. AI-Powered Inspection

✓ Advantage

Function Category		AOI		AI	Application Examples
Dimension Measurement	✓	High-speed / High-precision		Handles general dimensions	Abnormal hole size, component misalignment
Alignment Inspection	✓	Line/edge/shape matching	✓	Pattern structure recognition	Die-cut misalignment, double-layer printing error
Color Difference Check		Color thresholding; low accuracy	✓	Color learning; high accuracy	Print color shift, uneven ink
Surface Defect Detection		Limited handling on glossy surfaces	✓	Can detect dents / embossing/cracks	Metal scratches, foreign object dents
Damage Inspection	✓	Edge comparison ✓	✓	Learns and reinforces damage patterns	Missing holes, broken pieces, fractures
Foreign Object Detection		Limited to shape anomalies	✓	Diverse foreign object recognition	Oil stains, dust, splatter
Barcode / OCR		Barcode scanning, text matching	✓	Can read blurred or stylized text	Wrong barcode, font error, missing characters
Texture Judgment		Not supported	✓	Detects fabric texture / ink embossing	Mura, fabric embossing, dot patterns
Image Classification		No learning capability	✓	Auto-learning and classification	Overall appearance anomaly detection
Complex Defect Detection		Easily misjudged, hard to rule-based	✓	Learns irregular anomaly patterns	Irregular oil stains, cracks, uneven coating

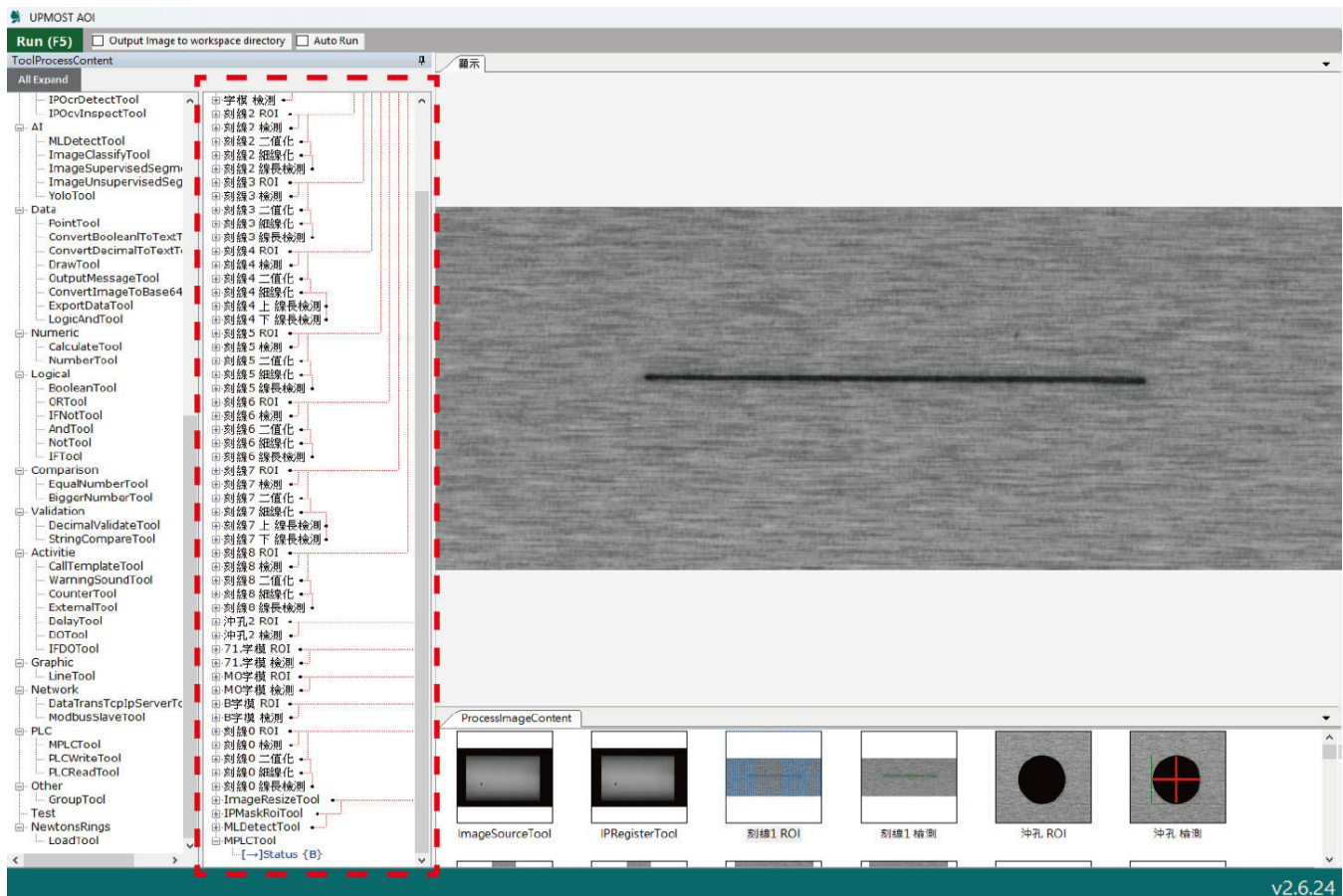
Technical Advantage

- **No-code & workflow-based operation:** No programming required — built on a process-driven architecture.
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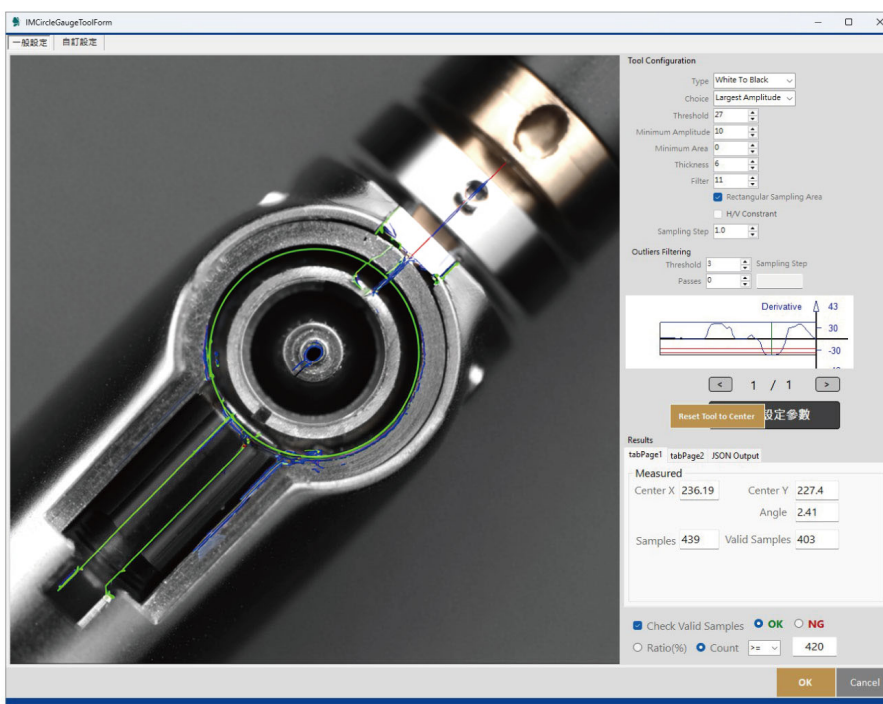
No-code & workflow-based operation

No programming skills required. The intuitive user interface is simple, easy to use, and quick to learn.



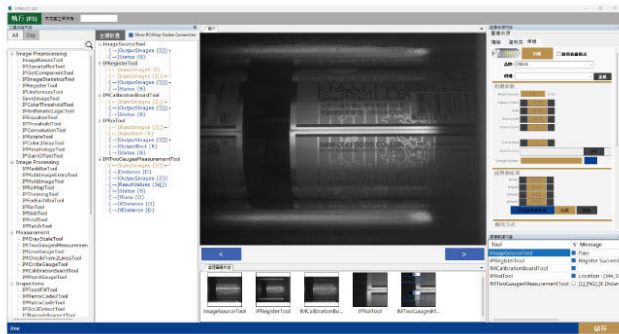
Parameter-based & Quick setup

Easily configure measurement zones, positions, angles, and scale through a user-friendly parameter interface.

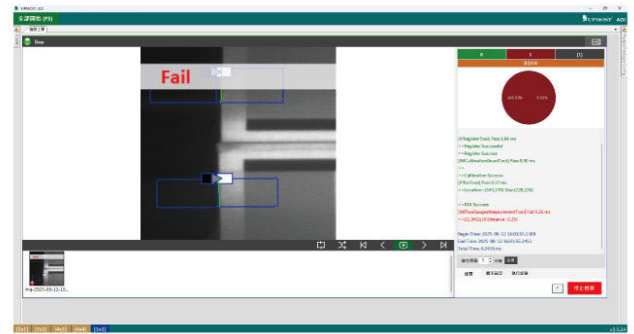


Rapid development

Completed UPMOST AOI deployment in only 2 weeks.



Workflow Setting



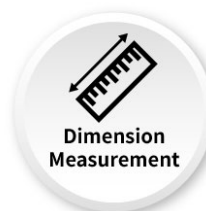
Online Testing

AOI Main Features — UPMOST AOI



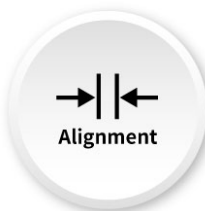
Image Adjustment

Image scaling, rotation, and flipping.



Dimension Measurement

Measurement of length, width, distance, etc.



Alignment

Image alignment and correction, corrects camera angle issues.



Blob Analysis

Morphological processing techniques, including dilation, erosion, opening, and closing.



Brightness

Adjusts brightness to achieve uniform and consistent illumination.

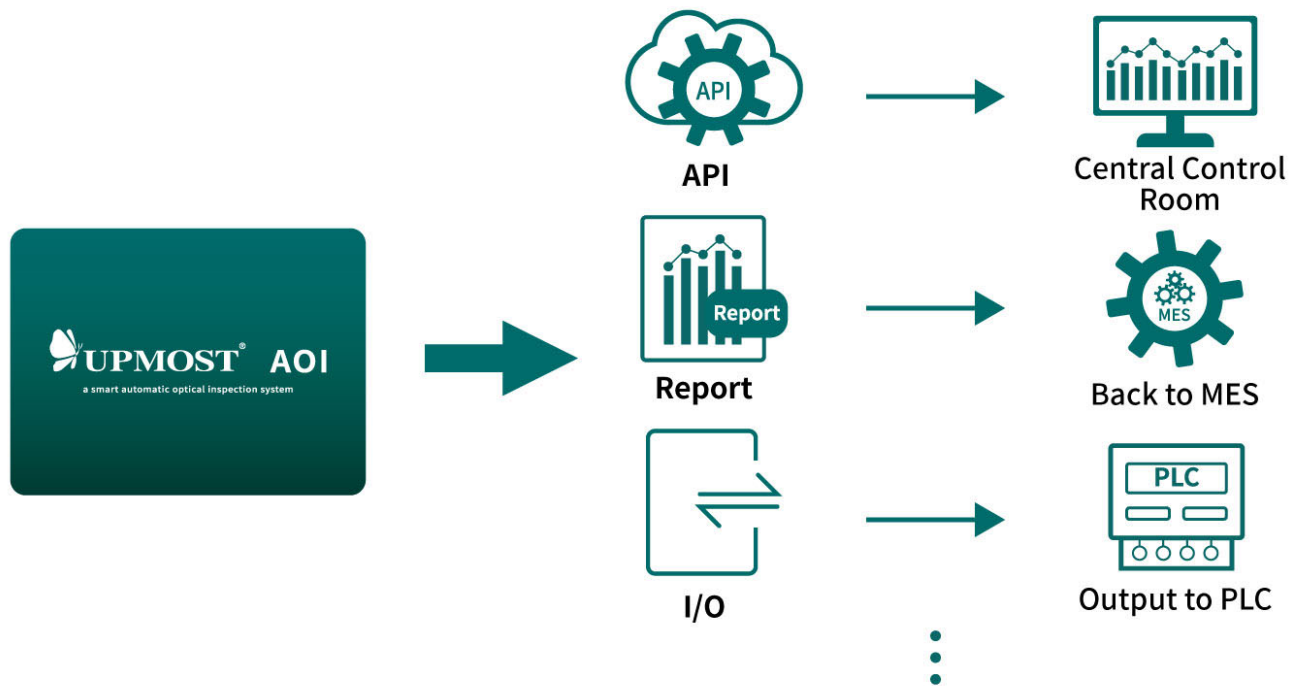


Morphological Processing

Object contour, area statistics, centroid, shape analysis, etc.

Multiple Output Formats — UPMOST AOI

UPMOST AOI supports multiple output formats, enabling inspection results to be exported in formats like logs, reports, PLC, and I/O signals, ensuring seamless system integration.



Scalability — UPMOST AOI

Built-in with a variety of functional modules — including AI, PLC, Data, and Image Preprocessing/Processing.

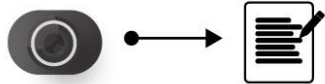
The system can be expanded based on future application needs, providing a smart and efficient vision inspection platform.



3 Operation Modes & Multi-Threaded Parallel Processing—

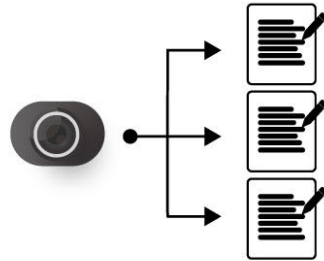
UPMOST AOI

Users can create multiple inspection tasks for different features of the same product, executed in parallel to improve efficiency. Such as alignment check, scratch detection, and color verification.



One-to-One

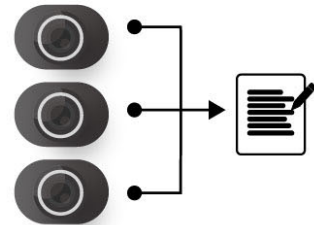
One inspection task per camera.



One-to-Many

Each camera handles multiple inspection tasks.

- **Sequential image capture:**
A single camera mounted on a robotic arm inspects multiple areas one by one.
- **Simultaneous inspection:**
Performing multiple inspection processes on the same image.



Many-to-One

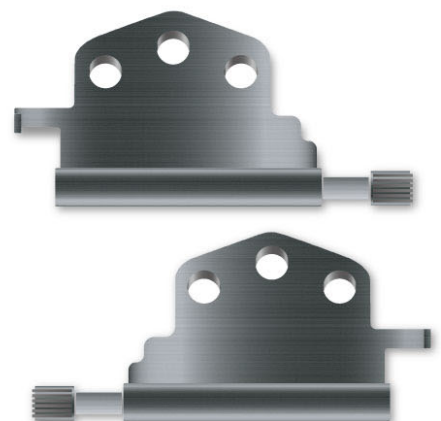
Multiple captures correspond to a single inspection task.

- Such as: rotational continuous shooting with uniform inspection workflow.

6 Surfaces Captured | 12 Defect Types | 25 Inspection Tasks

Completed robot arm integration and laptop hinge inspection system development in about 2 and 3 months, respectively.

Item	Inspection surface					
	A	C1	C2	B1	B2	B3
1.Bushing no mounting holes / threading			✓			
2.Check Rib(Drilled holes, Corner defects)			✓			
3.Shaft not aligned		✓				✓
4.Piece Count / Debris / Color Difference	✓	✓				
5.Laser marking missing/displacement		✓				
6.Mount overpressure deformation		✓				✓
7.DTM-pressure mark				✓		
8.Surface scratch / abrasion	✓	✓				✓
9.Missing solder / burn marks	✓	✓				
10.Bushing misalignment		✓				
11.Shaft indentation	✓	✓		✓	✓	✓
12.Shaft indentation / embossing	✓	✓		✓		✓



Extensive Tool List – UPMOST AOI

Category	Image Preprocessing	Image Processing	Measurement/Gauge	Inspection	AI	Data	Numeric	Logical
Functional Module	ImageResizeTool	IPMaskRoiTool	IMGrayScaleTool	IPFloodFillTool	AI SVisionTool	PointTool	CalculateTool	BooleanTool
	IPGetComponentTool	IPRoiMapTool	IMLineGaugeTool	IPMatrixCode2Tool	MLInspectionCriteriaTool	ConvertBooleanToTextTool	NumberTool	ORTool
	IPMultiMaskTool	IPThinningTool	IMCheckFrom2LinesTool	IPMatrixCodeTool	MLDetectTool	ConvertDecimalToTextTool		IFNotTool
	IPRegisterTool	IPMultiImageEntryTool	IMEdgeSegmentDifferenceTool	ICBarcodeInspectTool	ImageClassifyTool	DrawTool		AndTool
	IPUniformizeTool	IPMultiImageTool	IMCircleGaugeTool	ICSilverPaintInspectTool	ImageSupervisedSegmentTool	OutputMessageTool		NotTool
	SaveImageTool	IPForEachRoiTool	IMEasyCalibrationTool	IPBarCodeTool	ImageUnsupervisedSegmentTool	ConvertImageToBase64Tool		IFTool
	IPOTSuThresholdTool	IPRoiTool	IMCalibrationBoardTool	IPOCrDetectTool	YoloTool	ExportDataTool		
	IPArithmeticLogicTool	IPBlobTool	IMPointGaugeTool	IPOCvInspectTool		LogicAndTool		
	IPEqualizeTool	IPFindTool	IMDistanceFromPointPointTool					
	IPInvertTool	IPFixImageTool						
	IPThresholdTool	IPMatchTool						
	IPAdaptiveThresholdTool							
	IPCalibrateTool							
	IPConvolutionTool							
	IPRotateTool							
	IPColor2GrayTool							
	IPMorphologyTool							
	IPGainOffsetTool							

Category	Comparison	Validation	Activities	Graphic	Network	PLC	Other
Functional Module	EqualNumberTool	DecimalValidateTool	CallTemplateTool	LineTool	DataTransTcpIpServerTool	KeyencePLCTool	ResultReporterTool
	BiggerNumberTool	StringCompareTool	WarningSoundTool		ModbusSlaveTool	ModBusTCPConnectTool	GroupTool
			CounterTool			MPLCTool	
			ExternalTool			MPLC_IPConnectTool	
			DelayTool			PLCWriteTool	
			DOTool			PLCReadTool	
			IFDOTool				

AI Main Features — AISVision



Actively detects positional deviation, unaffected by shifting locations.



Capable of accurately detecting fine scratches and minor contamination.



Flexible detection for complex and variable shapes.



Detects abnormal textures on reflective materials.



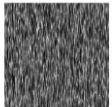
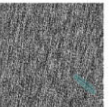
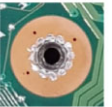
AI ignores noise and focuses on defect areas.



Automatic product type recognition.

5 - AI Algorithms — UPMOST AISVision

Offers five different algorithms. allowing users to select the most suitable one based on industry and application needs.

Algorithm	Application Scenarios	Illustration or Diagram	
Oriented Object Detection 	• Suitable for scenarios with multi-angle object arrangement • Addresses the issue of difficulty in aligning defect markings with objects of various angles	OK	NG
			
Segmentation 	• Applicable for precise defect detection where defect areas constitute a small proportion of the overall image	OK	NG
			
Object detection 	• Suitable for images with well-defined object boundaries • Delivers high-accuracy defect recognition	OK	NG
			
Classification 	• Applicable for scenarios with clear image feature regions that are not too small relative to the entire image	OK	NG
			
Anomaly Detection 	• Suitable for situations with limited defective product and defect sample data • Simple detection for distinguishing between good and defective products • Capable of handling detection requirements for unknown defects	OK	NG
			

4 - Step Process to Complete Model Training and Validation

An Intuitive, Rapid, and Streamlined Workflow for Project Model Development



Choose model

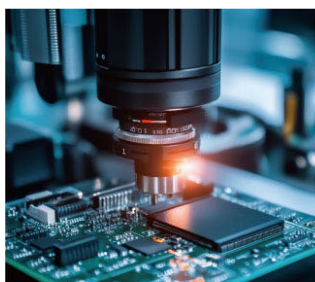
Label image

Train model

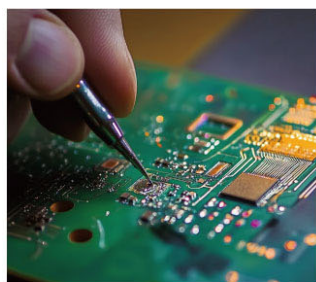
Verify model

Diverse Application Use Cases

Computer Vision Suite supports a wide range of industries —from semiconductor packaging and solder joint inspection to missing part detection and print defect analysis —all in one unified platform.



Semiconductor Industry
Wafer Packaging Inspection



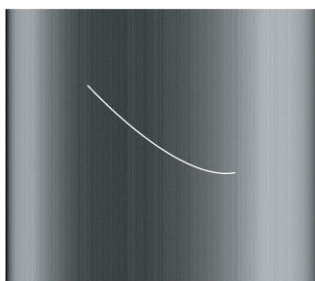
Manufacturing Industry
Soldering Point Inspection



Traditional Industry
Missing parts



Production Line
Quality Control



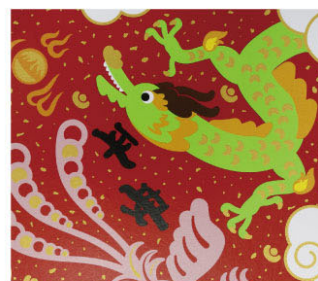
Steel Industry
Scratch Detection



Medical Industry
Drug Quality Control



Optical Industry
Lens Scratch Detection



Cultural Creative Industry
Print Flaw Recognition

Industry Category	Defect Type	Core Technology	Key Functional Combination
PCB/SMT	Insufficient solder / Solder bridging / Cold solder joint	AOI	Contour tracking + Steel texture modeling + AI defect matching
Consumer Products	Surface scratches / Damage / Assembly misalignment / Missing parts	AOI	Surface defect detection + Alignment matching + Texture analysis
Automotive Components	Insufficient solder paste / Wrong soldering / Missing parts / Cracks	AOI	Alignment measurement + Defect matching + Edge recognition
Printing	Ink color deviation / Uneven ink layer	AI	Color learning + Image classification
Display Industry	Transparent material foreign objects (bubbles, stains)	AI	Background variation learning + Detail magnification recognition
Food Packaging	Barcode misprint / Scan failure	AI	Blur recognition + Character recognition
Steel Inspection	Surface oxidation / Indentation / Cold cracks	AOI + AI	Contour tracking + Steel texture modeling + AI defect matching
PCB/SMT	Broken lines / Pin offset	AOI + AI	Line detection + Object classification
Textile	Frayed edges / Tears	AOI + AI	Edge analysis + Defect learning