

DaoAI AOI SYSTEM

ALL-IN-ONE VISUAL AI INSPECTION

Assembly, Foreign Objects, and Surface Defects

Train AI in **30s** with a **single defect-free** image, continuously **optimizing** through error learning.



1ms
per part
detection

99%+
high-precision
multi-part recognition

The built-in AI of DaoAI's AOI system learns from defect-free samples and can detect defects such as scratches and angle deviations. It leverages advanced AI capabilities to identify and classify defects on complex components and variations with remarkable speed and precision. AOI system integrates camera configuration image optimization, AI training, and data management into a web platform. Enabling seamless deployment for users and ensuring a smooth and exceptional user experience.

AI-BASED DEFECT INSPECTION

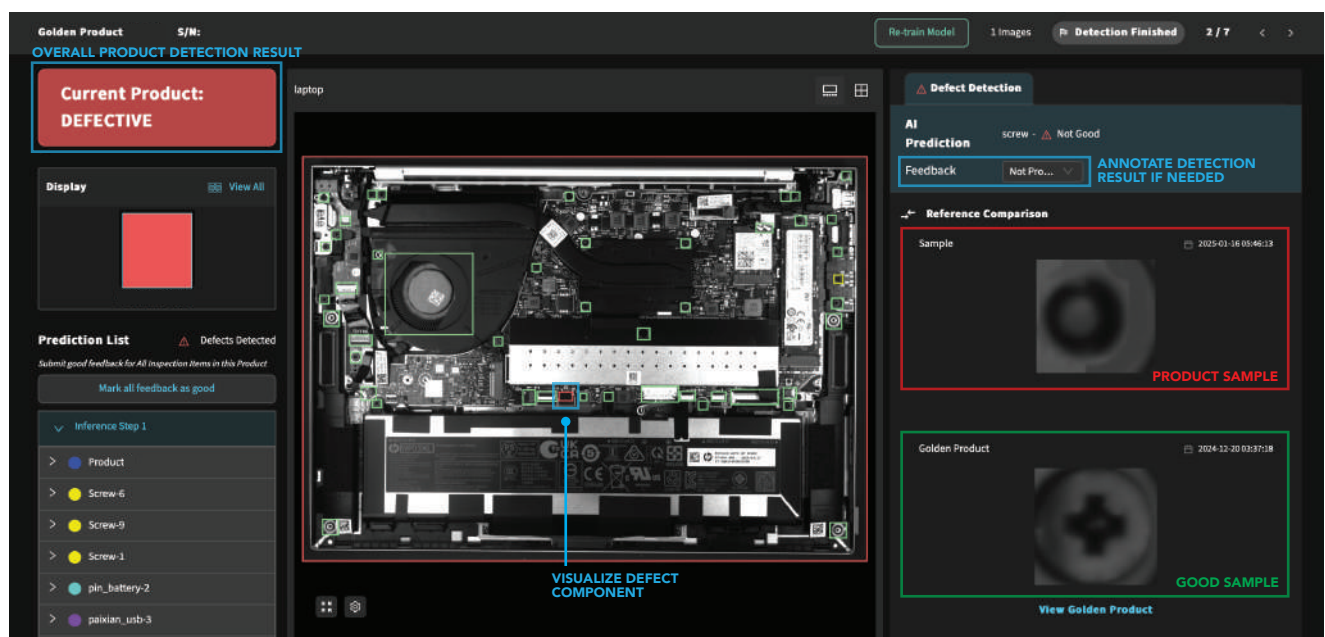
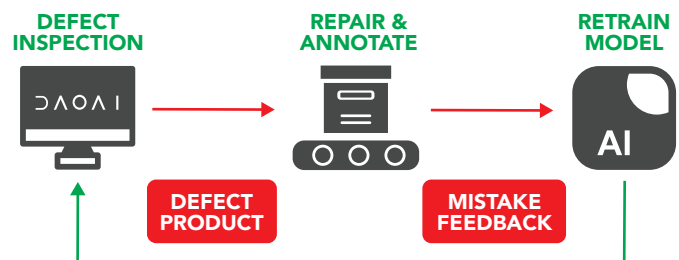
All Positive Data Training

Traditional vision systems rely on extensive data of both defect and non-defect images for training. In contrast, DaoAI AOI requires only a few good reference images to complete the learning process and build the AI model, enabling swift and efficient on-site deployment.

| | All Positive Data Training | Edge AI | Typical Deep Learning |
|------------------|-----------------------------------|----------------------------|-----------------------------|
| Data Requirement | 1-20 good sample reference images | 10-20 good and defect data | 100+ sample and defect data |
| Learning Time | 30 Seconds | Several minutes | Several hours to days |
| Accuracy | High | Medium | High |

Feedback Loop

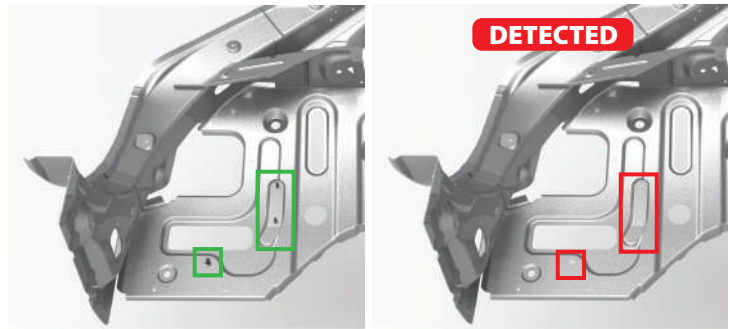
Similar to how humans learn from experience, DaoAI seamlessly integrates human feedback into its learning process. When defective products are detected on the production line, on-site personnel can review and verify them and confirm or give feedback within the system, enabling real-time model updates. This approach ensures continuous improvement in accuracy over time.



■ IDEAL FOR ANALYZING COMPLEX SURFACES WITH CHALLENGING FEATURES

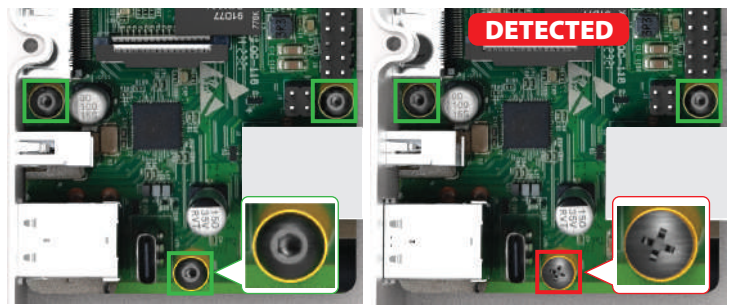
High Reflectivity Objects with Uneven Lightings

Unlike other machine vision learning systems, AOI's algorithm is capable to detect high-reflectivity objects and dark object, making it suitable for a wide range of applications.



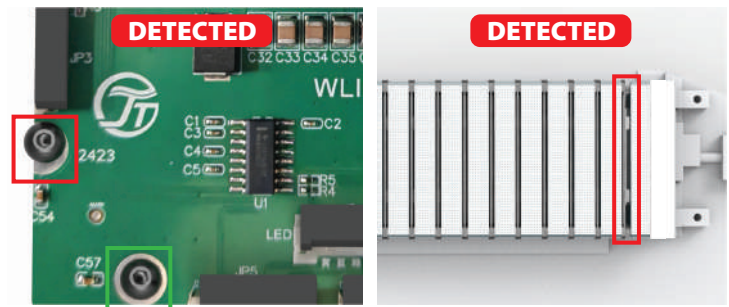
Texture Differences

Accurately distinguishes subtle variations, such as between different types of nails or screws.



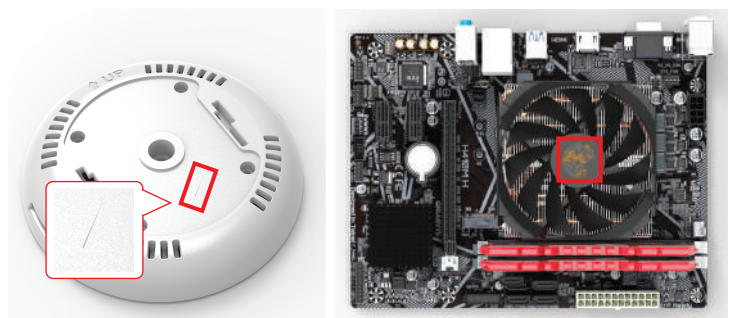
Positional Verification

Detects deviations in component sizes, misalignments, or incorrect angles.



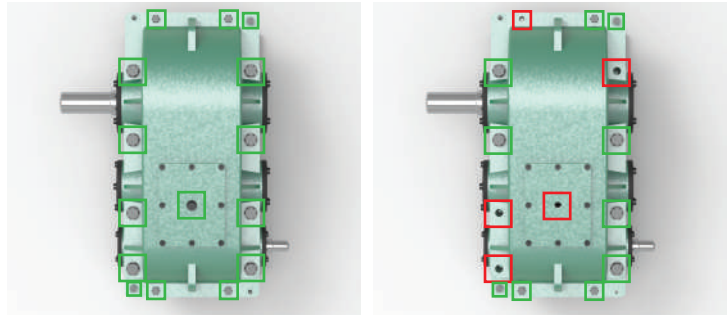
Surface Defects

Identifies dirt, dents, and other minor imperfections that may compromise quality.



Assembly Verification

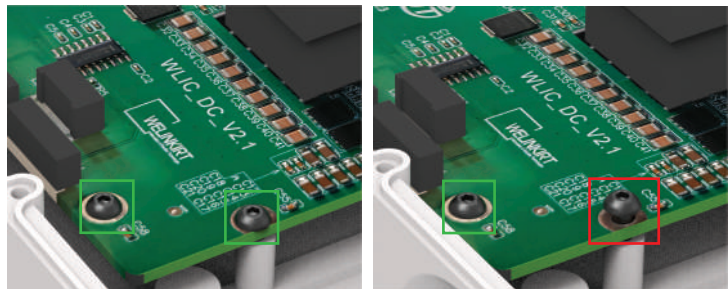
Detects deviations in component sizes, misalignments, or incorrect angles.



Height Detection

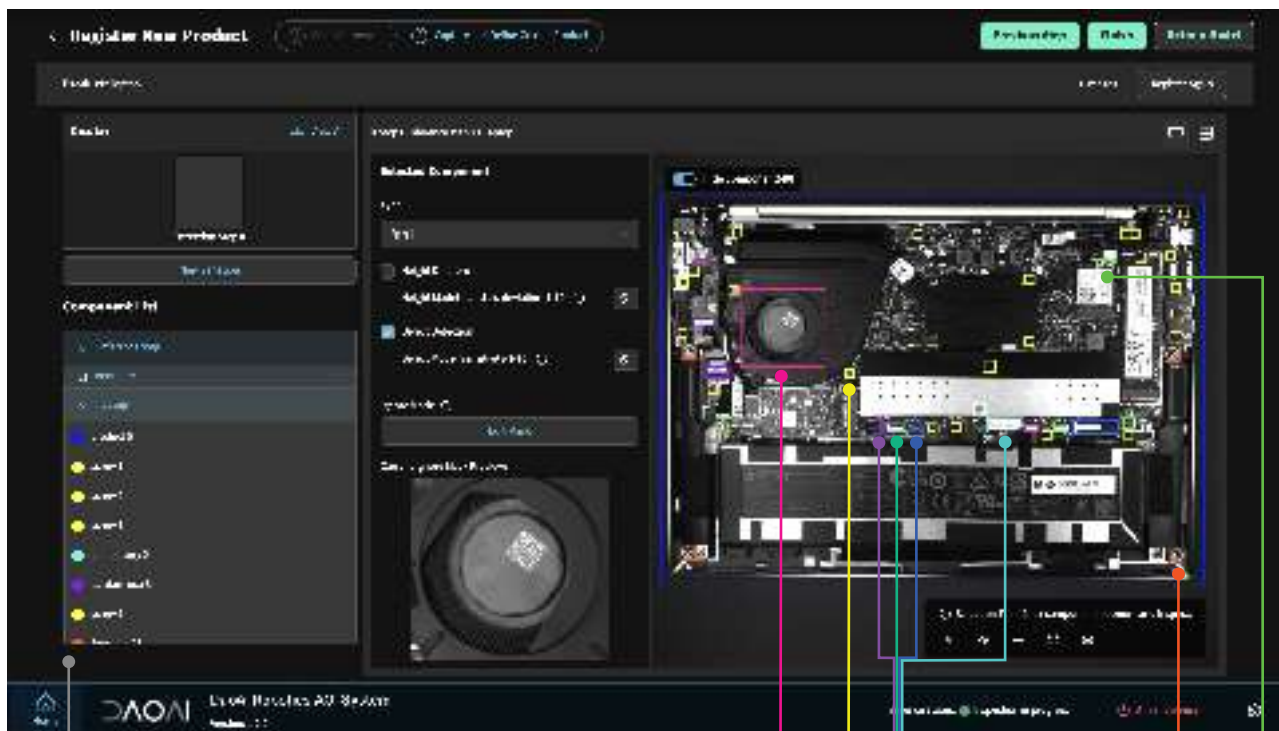
Ensures components like nails are properly screwed in and on correct height level.

Height Detection requires using DaoAI 3D Camera. Learn more about 3D Camera on Page 9.



ALL IN ONE DEFECT & UNLIMITED COMPONENTS INSPECTION

DaoAI AOI supports a wide range of component and surface identification, processing inspections on 50 different components in just 50 milliseconds. For example, defects on connector can be detected across hundreds of parts in mere seconds. This capability is ideal for industries like electronics manufacturing, where hundreds of components must be inspected simultaneously to identify defects such as misalignment, scratches, or plugs.



COMPONENT LIST

View all components that are under detection

Edit + Annotate Anytime

FANS

- Defects (dirt or dents)

SCREWS

- Defects
- Wrong screw types
- Angle precision
- Presense

RUBBERING

- Presense
- Positioning

CONNECTOR

- If plugged in place
- Defects
- Positioning

WIRING

- Postioning

KEY HIGHLIGHTS

- 1ms detection time per components
- Detecting all necessary components at once
- Instantly retrain model to optimize performance
- Eliminates the need for multiple separate systems

MANUAL ANNOTATION:

Simply self select all components that needs inspection.

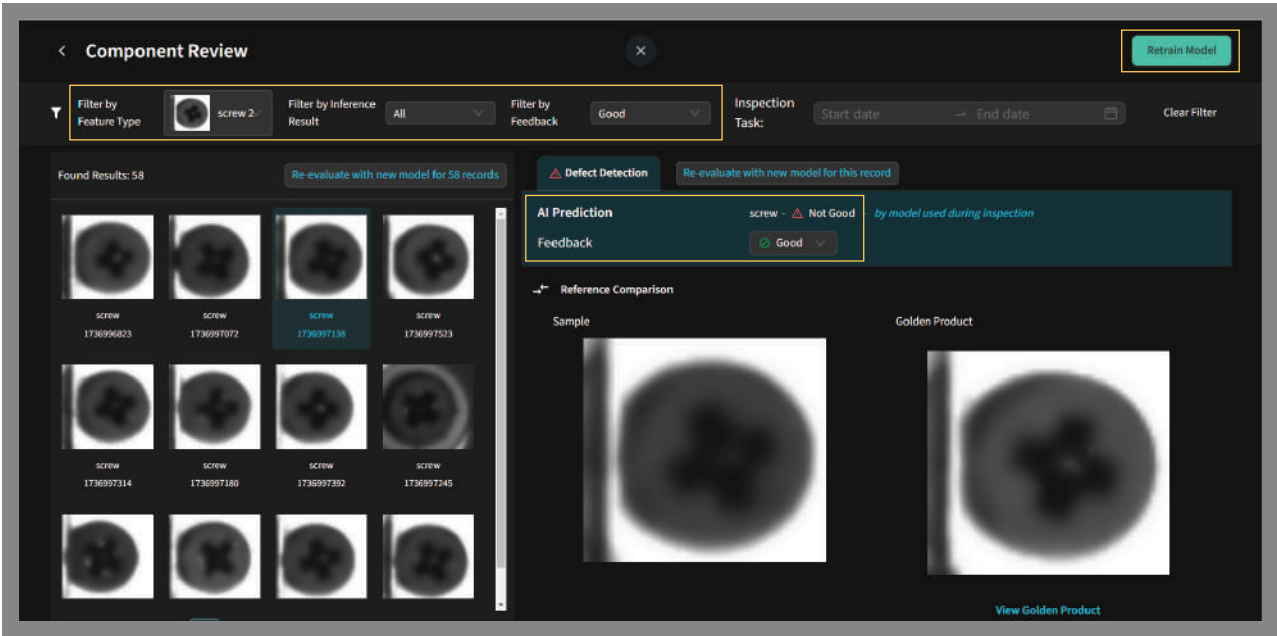
AUTO ANNOTATION:

AI detects components based on deep learning results from DaoAI World model.

* 1ms detection speed based on RTX 3080 hardware performance.

STREAMLINED INSPECTION AND MANAGEMENT ON CENTRALIZED PLATFORM

DaoAI AOI empowers users to instantly review inspection results and adjust learning models through a user-friendly platform. Also by integrating camera configuration and data management into a unified web-based interface, it eliminates the need to navigate multiple software tools.



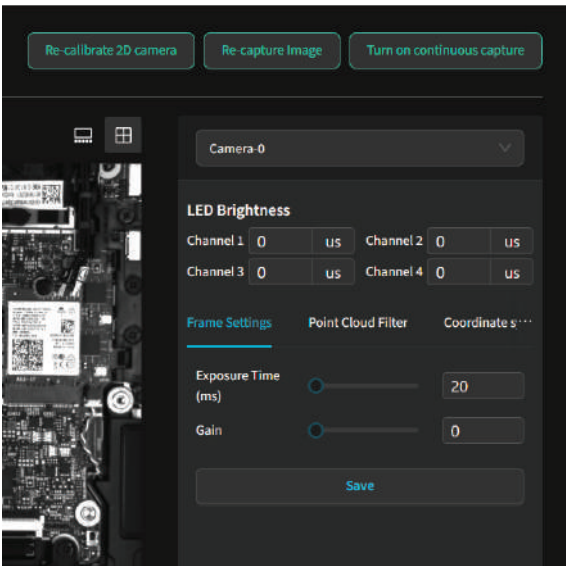
- Filter by Feature Type (Components)
- Filter by Inference Result
- Filter by Feedback
- AI Inspection Result
- Verify; Confirm Result or Feedback
- Retrain Model based on feedback
- Enable to check overall components quality level and modify production.

INSPECTION RESULT OVERVIEW

| Search by Golden Product | | | Start date → End date | |
|--------------------------|--------------|-----------|-----------------------|--|
| Serial Number | OK/NG Counts | Pass/Fail | | |
| SN8756391 | 37 0 | PASS | | |
| SN8756392 | 37 0 | PASS | | |
| SN8756393 | 22 15 | FAIL | | |
| SN8756394 | 37 0 | PASS | | |

To find out defect on a specific product, AOI offer to search by product name or serial number.

CAMERA CONFIGURATION



All settings are customizable, edit camera parameters based on different environment for better result.

■ TACKLE AND LEARN AT EVERY STAGE OF THE PROJECT

Learning



All Positive Learning

Learn from a few quality reference images to train the AI model, ensuring fast and efficient on-site deployment.



Feedback Loop

Incorporates human feedback into its learning process, automatically adjusting parameters to refine its model.

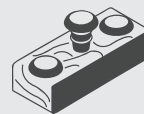


Inspection



AI-image Processing

AOI's detects high-reflectivity objects and adapts to uneven lighting, ensuring versatility across various applications.



Complex Surfaces Analyzing

AOI can identify tasks beyond the capabilities of traditional machine vision, such as screw angle deviations and connector tightness.



Live Dashboard

Check instant inspection results via the "Live Dashboard" and effortless model adjustments on a user-friendly platform.



Defect Review & Rework

Operators can access NG images and data, with defective materials sent to the rework station in real time or retrieved via QR code.



Management and Refine



Centralized Platform

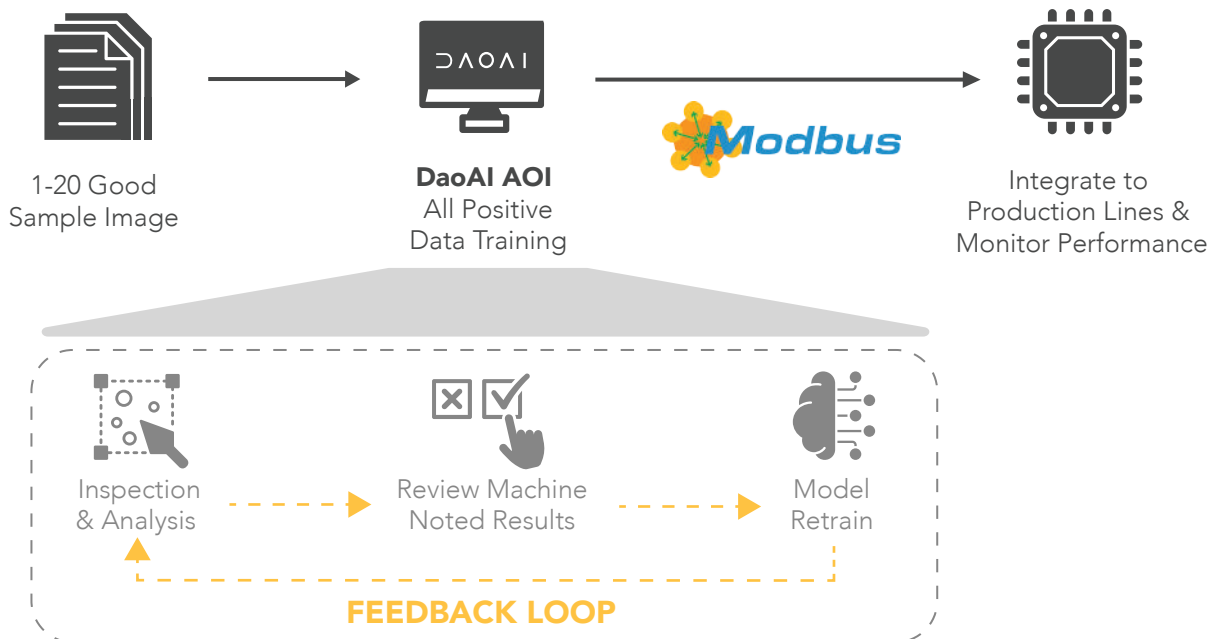
Unifies camera setup and data management in a web-based interface, enabling highly efficient collaboration.



Review & Retraining

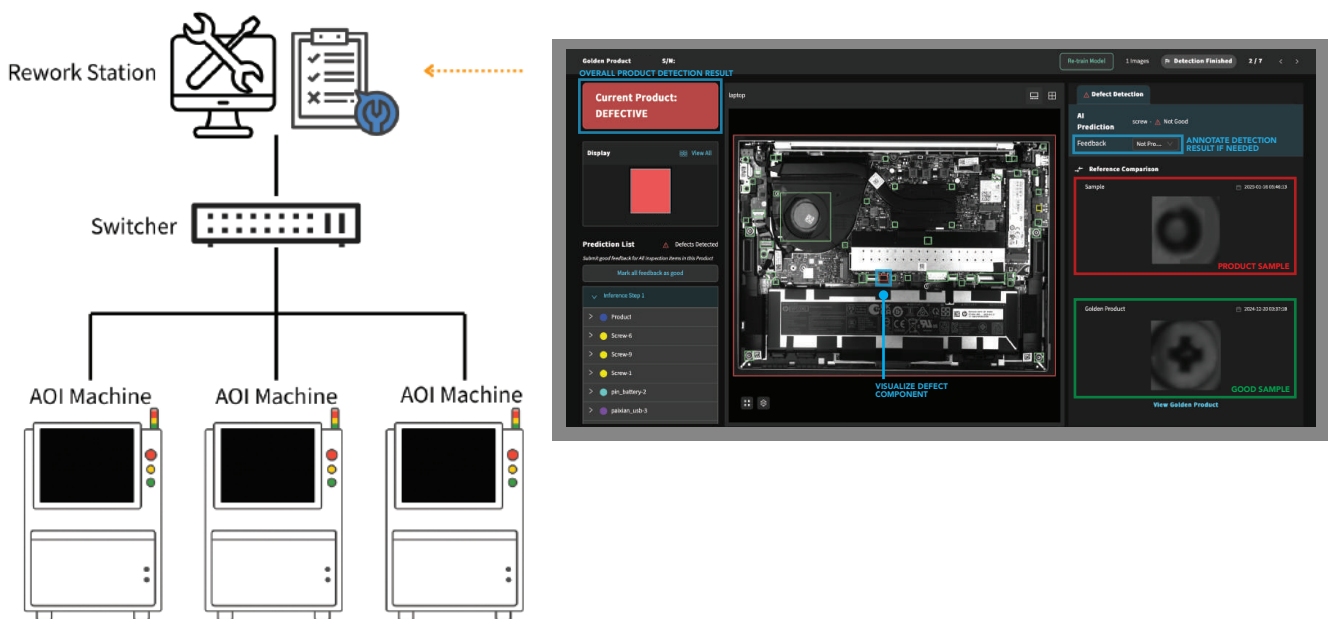
AOI enables real-time training, allowing instant application of corrections and minimizing production line disruptions.

GOOD SAMPLE IMAGE TO PRODUCT LINE



*AOI supports the Modbus communication protocol for transmitting information.

DEFECT REVIEW AND REWORK



- Easily review AOI images and defect details for smarter, data-driven quality control.
- NG items upload instantly to the rework station and can be retrieved via QR code.
- One rework station connects to multiple AOI units supporting multi-line, one-person operation.

COMING: 3D MACHINE VISION CAMERA

AD-080 Expose Even The Tiniest Defects



- Central camera with dual projectors ensures precise focus and measurement.
- Dual illumination provides uniform lighting and eliminates distortion.
- 18MP camera with 3D HDR captures black and reflective surfaces clearly.
- Independent controlled 2D/3D measurement modes with 10GigE transmission.
- Quick recalibration after vibrations or environmental shifts.
- 77×70mm FOV with 4μm repeatability for small component inspection.

AD-470 Big Vision, High Precision



- Central camera with dual projectors ensures precise focus and measurement.
- Dual illumination provides uniform lighting and eliminates distortion.
- 18MP camera with 3D HDR captures black and reflective surfaces clearly.
- Independent controlled 2D/3D measurement modes with 10GigE transmission.
- Quick recalibration after vibrations or environmental shifts.
- 477×435mm FOV with 40μm precision for laptop-sized objects.

AQ-060 Ultra-fast Imaging & 3D IReconstruction, Zero Blind Spots



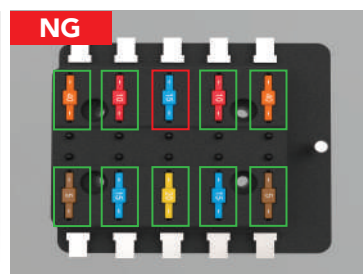
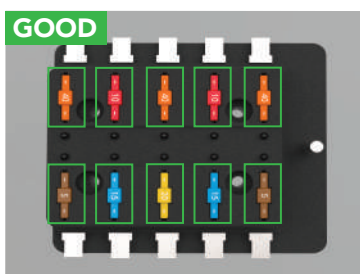
- Central camera with quad-directional projection for precise, focused imaging.
- 18MP camera with telecentric lens reduces distortion and eliminates blind spots.
- Four-way lighting prevents shadows and reflections for complete coverage.
- 1-second 3D reconstruction with 60×60mm FOV, ideal for PCB inspection.
- Supports 3D & 2D measurements, as well as RGB 2D imaging.
- Quick recalibration after vibrations or environmental shifts.
- CXP interface provides 10× faster data transfer than USB 3.0.

| Model | Working Distance | FOV | DOF | Image Pixel | Resolution | Repeat-ability | Connector | Power | Light | Cooling System |
|--------|------------------|-------------|-------|-------------|------------|----------------|-----------|------------|-----------|----------------|
| AD-080 | 186mm | 77×70@186 | ±8mm | 18MP | 4496×4096 | 4um | 10GigE | 24V DC 10A | White LED | Passive |
| AD-470 | 510mm | 477×435@510 | ±40mm | 18MP | 4496×4096 | 40um | 10GigE | 24V DC 10A | White LED | Passive |
| AQ-060 | 32mm | 60×60@32 | ±5mm | 18MP | 4288×4288 | 2um | CXP-12×4 | 24V DC 12A | White LED | Passive |

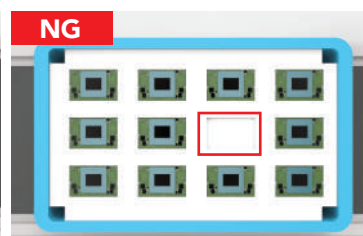
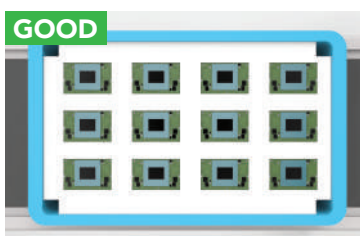
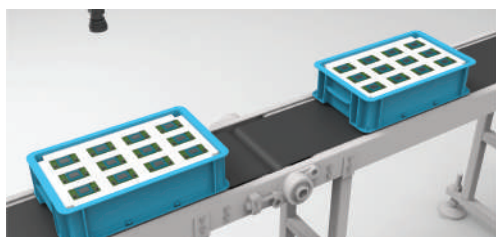
The 3D camera and Daoai AOI system software are sold separately.

USE CASE

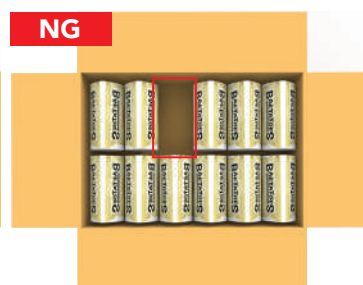
AUTOMOTIVE: Detection of Car Fuse Boxes



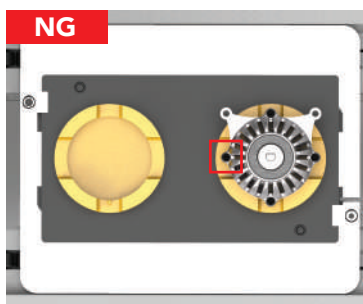
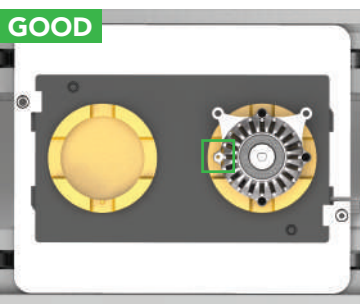
ELECTRONICS: Detection of the Quantity and Type of Circuit Boards



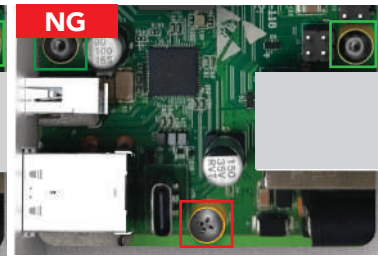
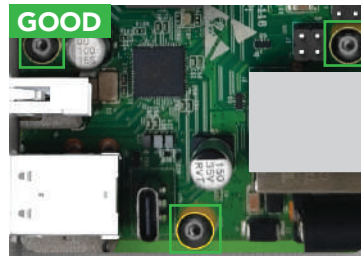
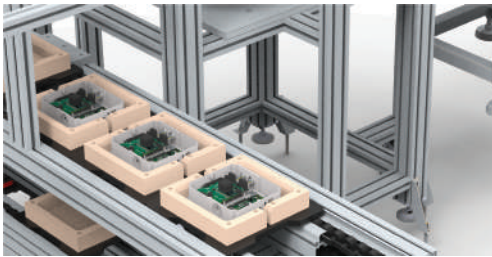
PACKAGING: Packaged Food Items Quantity Detection



MACHINERY MANUFACTURING: Component Assembly Inspection



ELECTRONICS: Components Texture Variation Detection



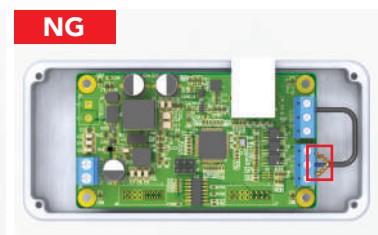
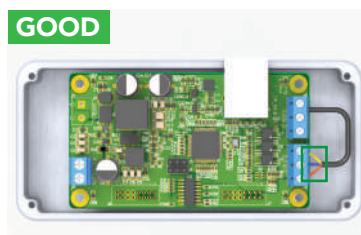
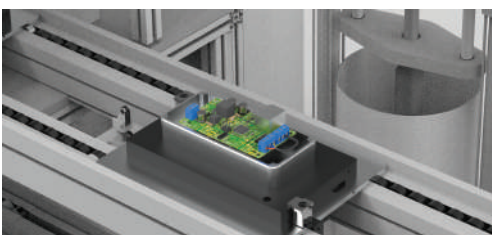
PACKAGING: Medicine Package Detection



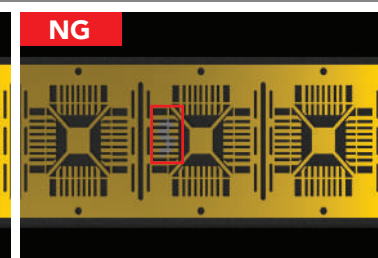
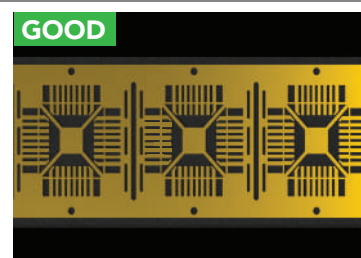
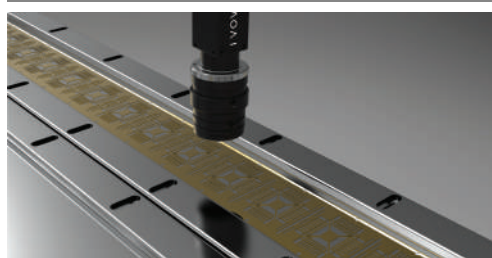
FOOD: Food Assembly Verification



ELECTRONICS: Lining Verification



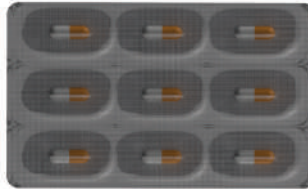
ELECTRONICS: Lead Frame Detection



PHARMACEUTICAL: Medication Assembly Verification



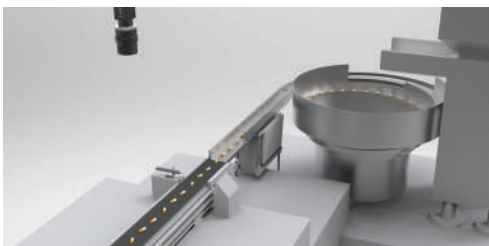
GOOD



NG



PHARMACEUTICAL: Capsules Quality Verification



GOOD



NG



HARDWARE REQUIREMENTS

Recommended PC SPEC:

| Capability | GPU | CPU | Storage | RAM |
|------------|--------------------|--------------|---------|------|
| 2D | NVIDIA 3060 | Intel 10500K | 1TB | 32GB |
| 3D | NVIDIA 4080 | Intel 10500K | 1TB | 32GB |

Minimum PC SPEC:

| Capability | GPU | CPU | Storage | RAM |
|------------|----------------------|--------------|---------|------|
| 2D | NVIDIA 1050ti | Intel 10500K | 256GB | 16GB |
| 3D | NVIDIA 3060 | Intel 10500K | 256GB | 16GB |

DaoAI AOI supports most 2D machine vision cameras available on the market. We support USB 3.0 and GigE interfaces to ensure optimal stability in industrial applications.



We supercharge industrial automation and manufacturing inspection with AI and 3D vision. With our powerful AI-driven machine vision, automation isn't just the future—smarter inspection is available now.

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