Machine Vision Based Inline QC

Machine Vision-Based Inline Quality Control for Manufacturing

Machine Vision-Based Inline Quality Control (QC) is an AI-based visual inspection technique that provides image analytics and processing capabilities for automated vision inspection systems, used for inline QC inspection in the manufacturing industry.

Precision Redefined:
AI Vision for Flawless Inspection

Enabling Technologies

AI Technology

visionAOI

Vision Technology

JAGER

Inspection Capabilities

Bond offset
The wire bond is not centered or aligned correctly on the bonding pad. Check the positioning of the of the wire bond relative to the bonding pad and ensure it's centered.

Die Crack/Chipping
A crack or damage to the die. Carefully inspect the die's surface for any visible cracks or defects.

Technical Specification

2D Vision System	Camera	5mp usb3 Colour Camera
	Field of View	8.5mm x 7mm
	Depth of Field	1mm
	Pixel Size	3.5um
	Min. Detectable size	18um
Computer System	System Operation	Windows 10 Professional
	Processor	Intel ® Core ™ i9
Mechanical Handling	Max. Substrate Size	300 (l) x 100 (W) mm
	Substrate Loading	Manual
	Substrate Clamping	Mechanical clamping
	XY Gantry System	XY Magnetic Linear Table
	Ionizer System (Based on 300mm Measuring Distance)	Ion Balance: ± 10V Destaticizing Timing: 3-5 sec

Technology Overview

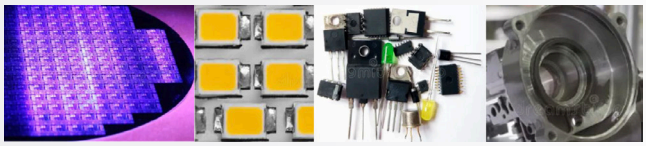
Mi-VisionAOI is a Machine Vision-Based Inline Quality Control (QC) platform developed by MIMOS, engineered to meet the rigorous demands of industrial automation and precision quality control. Designed as a modular and flexible system, Mi-VisionAOI empowers manufacturers to perform high-accuracy defect detection in complex patterns, surfaces, and components, far beyond the capabilities of traditional rule-based systems. It is especially adept at handling challenging inspection scenarios involving variation in lighting, surface texture, and orientation.

Technology Benefits

- **Multi-Modal AI Inspection Engine**
  Integrates detection, classification, segmentation, anomaly detection, and OBB localisation into a unified framework for comprehensive visual QC.
- **Enhanced Defect Understanding**
  Pixel-level segmentation and shape-aware detection algorithms help identify root causes and inform upstream process improvement.
- **Adaptive Anomaly Detection**
  Learns from normal production patterns and detects unseen or rare defects, reducing reliance on large labeled datasets.
- **Rapid Model Training & Visual Feedback**
  GUI-based model training with performance visualisation helps QC teams iterate faster and fine-tune model behaviour in production.
- **DLL-Based Integration for Minimal Downtime**
  Plug-and-play integration allows Mi-VisionAOI to be embedded into existing AOI stations without rearchitecting the line.
- **Industry-Tailored Architecture**
  Engineered for use in semiconductor, electronics, automotive, and packaging.

Key Features

- **Defect Classification**
  AI-based classification model categorises detected defects into predefined types for root cause analysis.
- **Defect Detection and Analysis**
  Real-time quality inspection with an AI-based defect detection to defect properties such as location, size and type on visible and non-visible light images.
- **Defect Segmentation**
  Advanced segmentation models isolate defect regions with pixel-level accuracy, enabling precise mapping of defect boundaries.
- **Oriented Bounding Box (OBB) Detection**
  Accurately localises rotated or skewed components, crucial for densely packed assemblies.
- **Anomaly Detection**
  AI-driven anomaly detection models identify deviations from normal patterns in real time, even for rare or undefined defects not seen during training.
- **Intuitive GUI-Based AI Model Training App**
  Mi-VisionAOI Training, a Windows-based GUI application for AI Model training and evaluation designed for rapid deployment, no coding and deep learning expertise required.
- **Real Time Third Party Automated Optical Inspection (AOI) Integration**
  Mi-VisionAOI Inference SDK, a robust Dynamic Link Library (DLL) that allows seamless integration with existing AOI platforms or custom machine vision pipelines. The DLL supports inferencing on real time image feeds, making it a plug-and-play solution for manufacturers looking to retrofit their systems with AI.



Maximize Your Technology Capabilities with ITIC's Shared Equipment!

Unlock your full technological potential with ITIC's shared equipment.

Access advanced tools and technology to elevate your projects, save costs, and boost productivity.

Ready to get started? Contact us today to learn more.

MIMOS ITIC Industrial Technology Innovation Centre

MIMOS Berhad 199501006785 (336183-H)
Jalan Hi-Tech 2/3, Zon Industri Fasa 1,
Kulim Hi-Tech Park, Kedah, 09000 Kulim.
Phone: +603 8995 5058
E-mail: itic@mimos.my

Parameswaran Ayahoo
parameswaran@mimos.my
016 6264 633

Adam Syahmi Rashadan
syahmi.rashadan@mimos.my
016 447 3207

Yoong Siew Wai (PhD)
ysiew.wai@mimos.my
012 2870 583