

# 訂閱 OT大講堂 頻道， 即時掌握產業最夯OT新知



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需求諮詢

方案類別

數位科技  數位智  智能儲運  討論  智能品質

整線自動化  上下料  智能品質

智能加工  物件辨

**需求諮詢單**

諮詢內容

可輸入 500 字

留言

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# OT大講堂

業界專業講師分享應用案例  
訂閱頻道OT資訊不漏接

GLÜCK 捷恩科技

智能革命：高度客製化工業AI與AOI的完美融合

無限次數回放觀看，彈性掌握學習時間

# 智能革命：高度客製化 工業AI與AOI的完美融合

邱威堯

捷恩科技/總經理

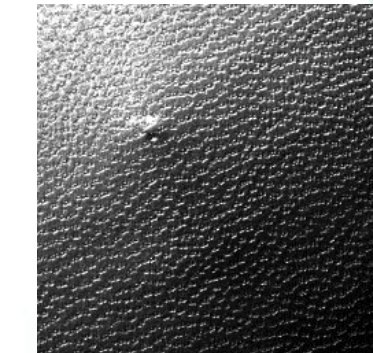
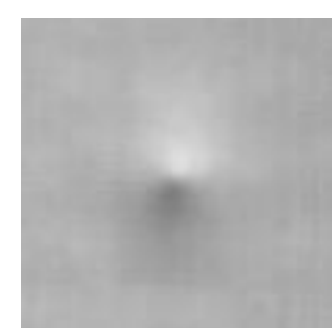
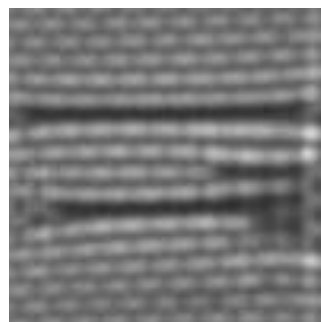
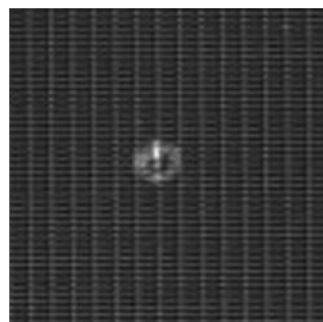
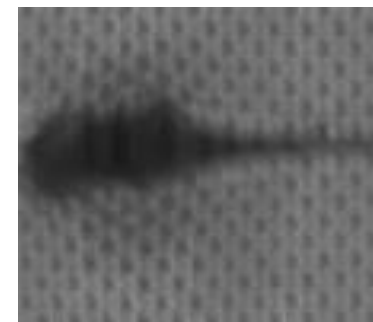
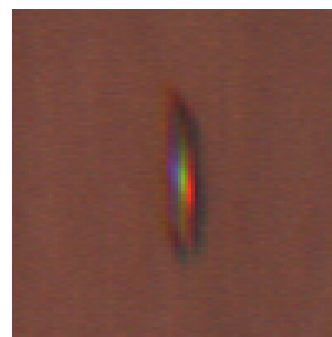
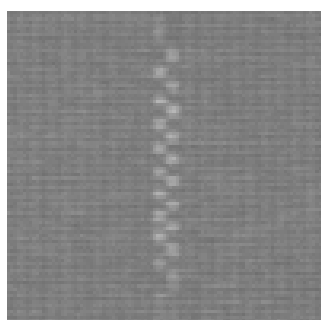
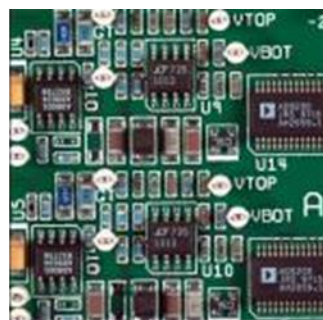
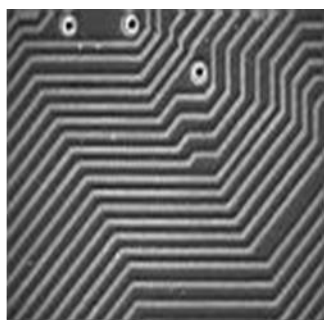


# AOI encompasses four main functions:

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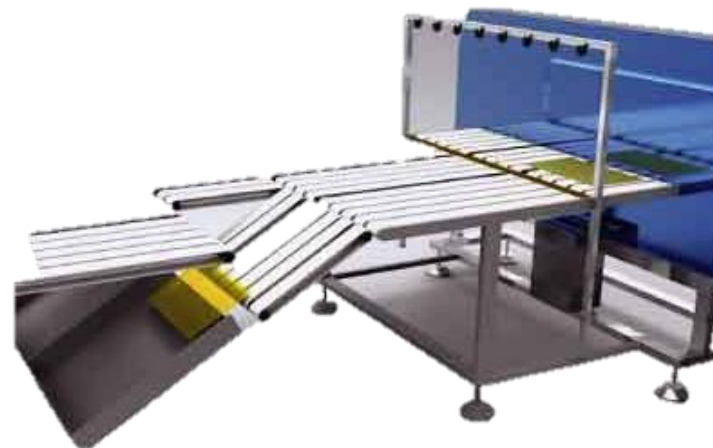
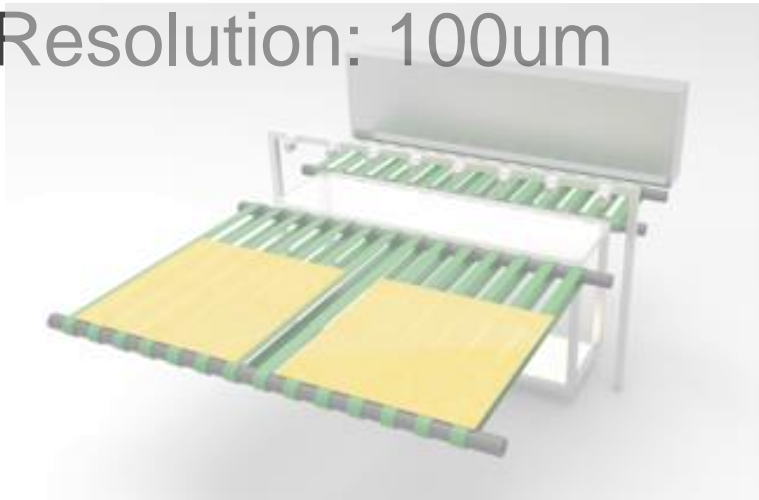
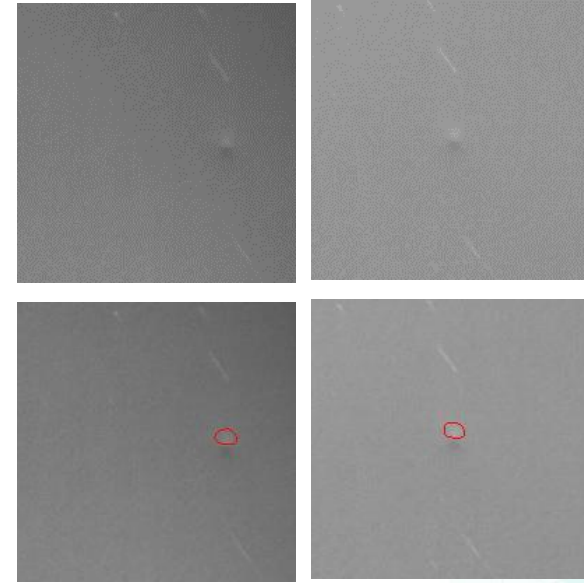
# Applications of Inspection

Inspection is commonly used to detect issues such as defects, incorrect assembly, faulty soldering, missing components, and more.



# Film Inspection system - Polarizer

- Inspect larger than 300um defect and arrow recognition
  - Defect type: peeling-off, crease, dent, scratch, mark, and handwriting.
  - Arrow pattern recognition
- Inspection width: 1600mm, total 2 line scan cameras.
- Inspecting speed: 40M /min
- Resolution: 100um

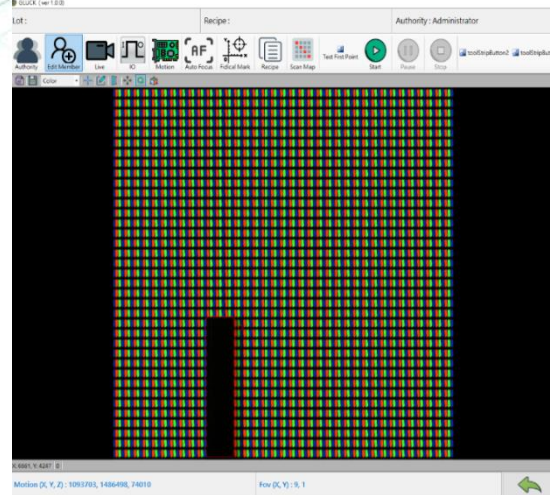




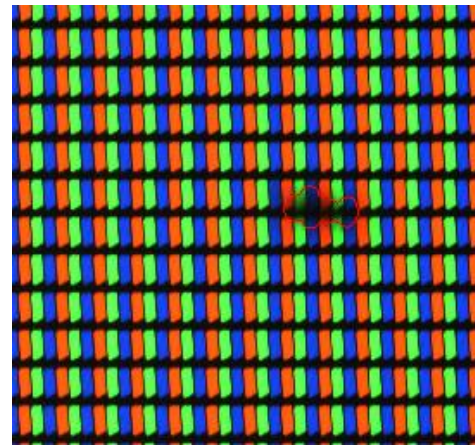
# FPD Inspection Machine

FPD contain up to millions of pixel.  
Identifying the positions of defects after massive transfers.

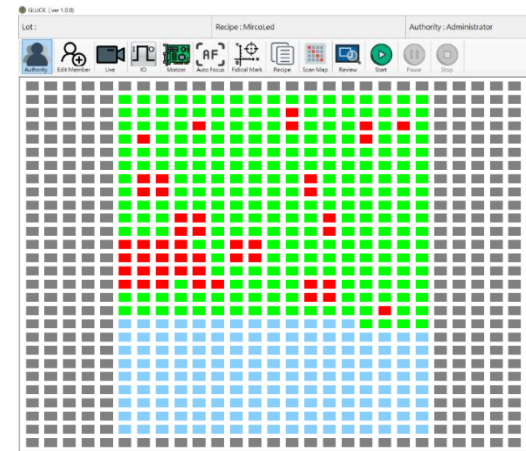
- Detection of Bright/Dark defective pixel
- Detection of Position Offset/Rotation
- Grain Brightness/Uniformity Inspection
- Defect Review/Coordinate Arrangement/Inspection Report



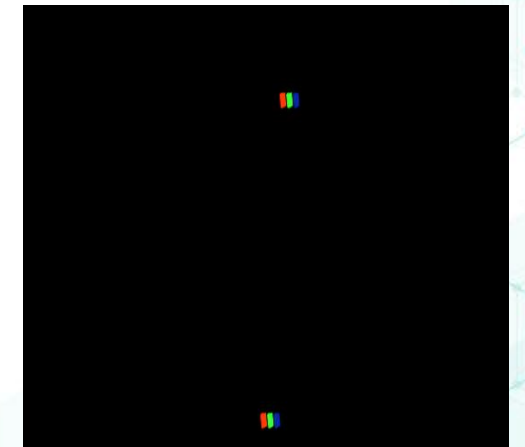
Macro inspection



Micro review



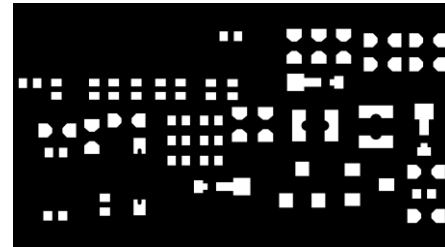
Defect map



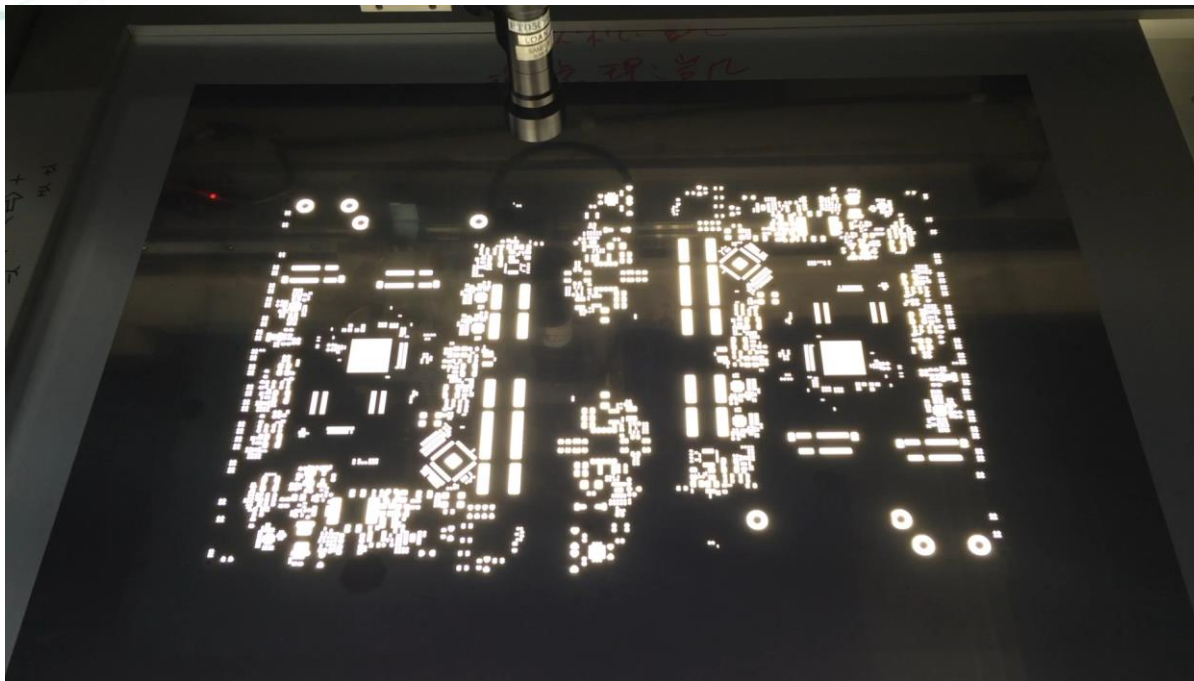
Coordinate Arrangement



# Stencil Inspection Machine



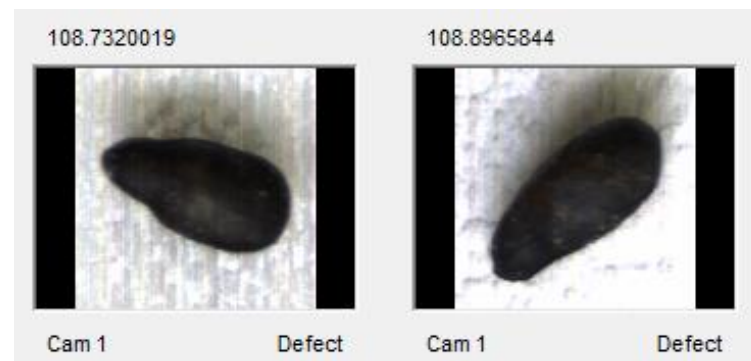
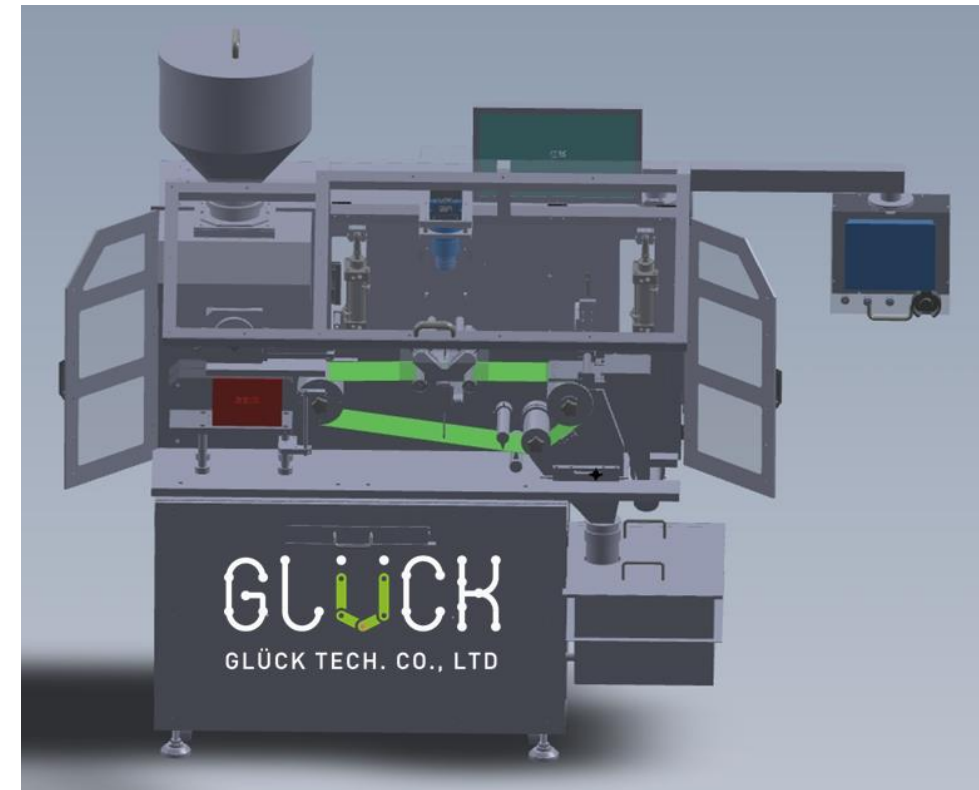
Hole detection of mask/SMT stencil plate



Steel plate size	Max. 740(W) x 810(L) mm
Check size (range)	Max 600 x 600 mm
Check the cut-out size	Defects with a minimum side length of 30 μm or more were detected
camera	2456 X 2054
resolution	3.45 μm +/- 0.3μm
Repeatability	0.01mm
Detect items	More than 30μm pinholes, holes, hole plugs, hole bias, pores, less pores, foreign bodies
lens	Low distortion telecentric coaxial lens (1x)
Safety devices	Workspace false touch detector
Check the abnormal handling system	Warning light and buzzer
Defective defect display	Hole position display diagram/defect location map
Light source	Coaxial LED backlight
XY axis optical ruler resolution	0.1μm
Movement safety settings	Motor overload current detection, limit detection
Moving mode with table servo motor	XYZ shaft drive
Device size	1922x1762x1452mm(LxWxH)
Device weight	1050kg
power supply	Single phase 220VAC, 20AMP50/60HZ
Compressed gas	5kg/cm <sup>2</sup> , 30L/min

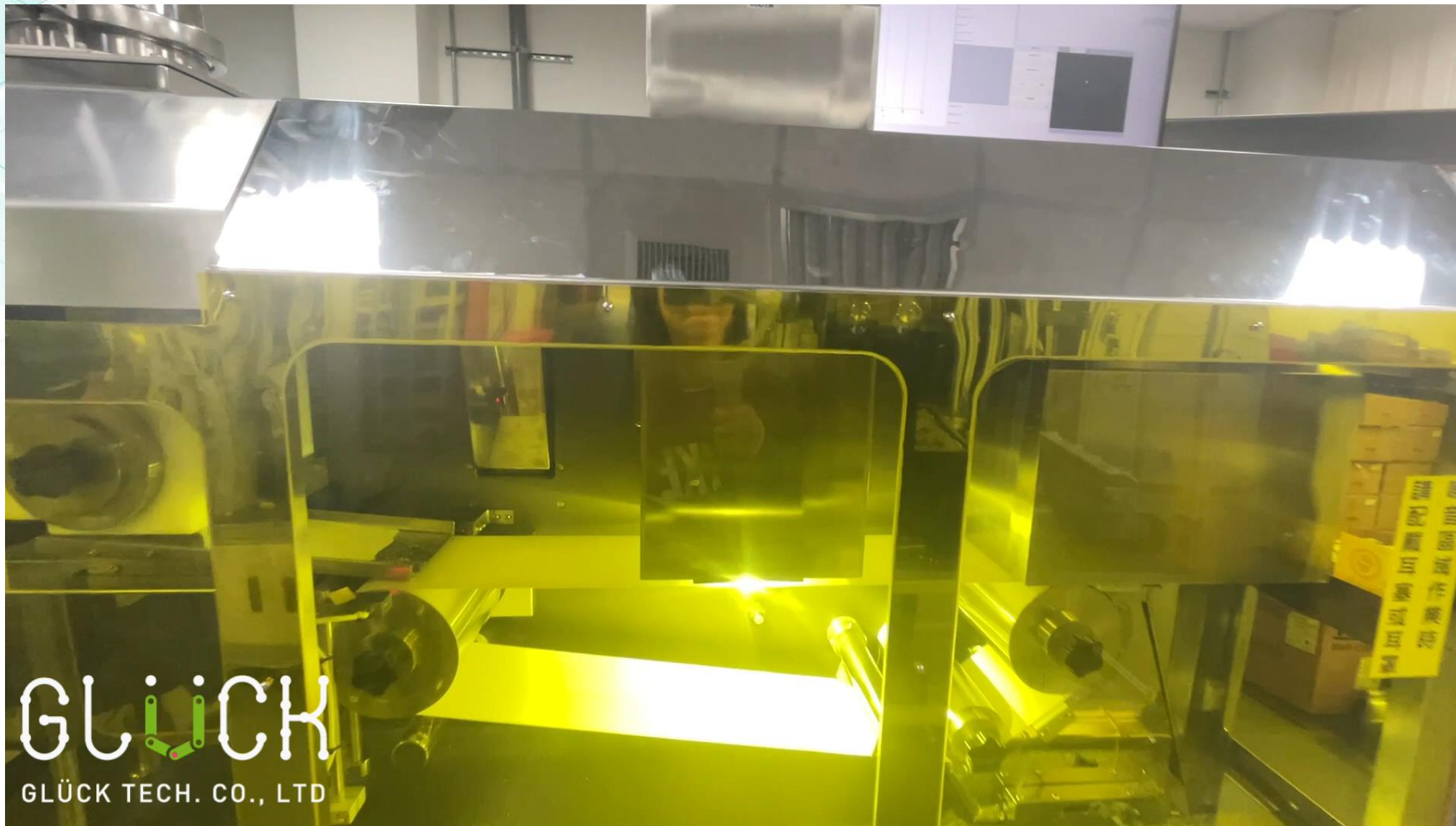
# Powder Inspection

- Powder size: 70um~700um
- Pixel Size: 10um/pixel
- CCD: Line Scan 16K
- FOV: 150mm
- Defect Size : >70um
- Throughput : 100kg/hrs
- Defect type: dirty, discolored, foreign matter, discoloration, impurities particles





# Powder Inspection



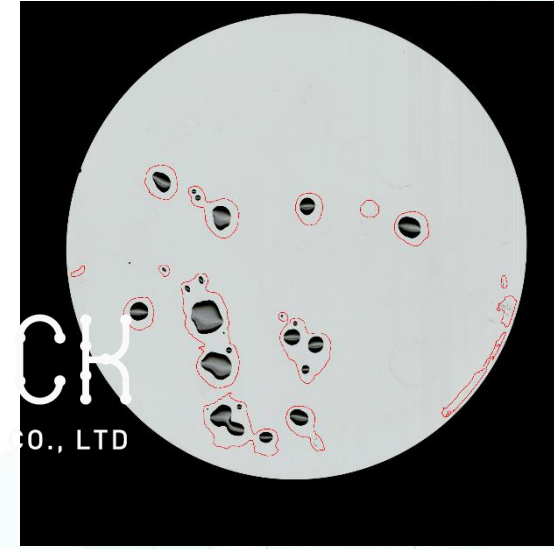
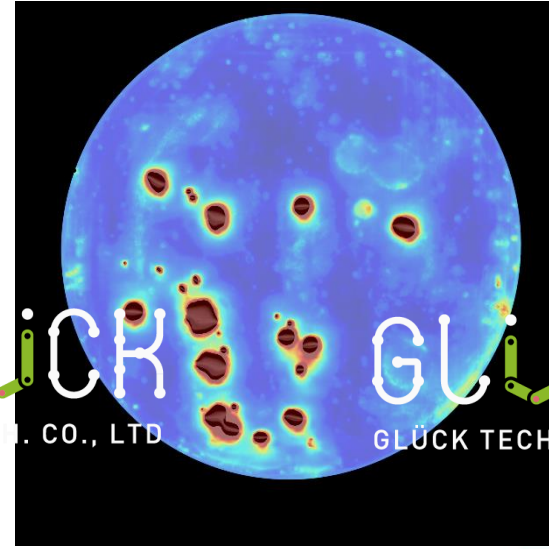
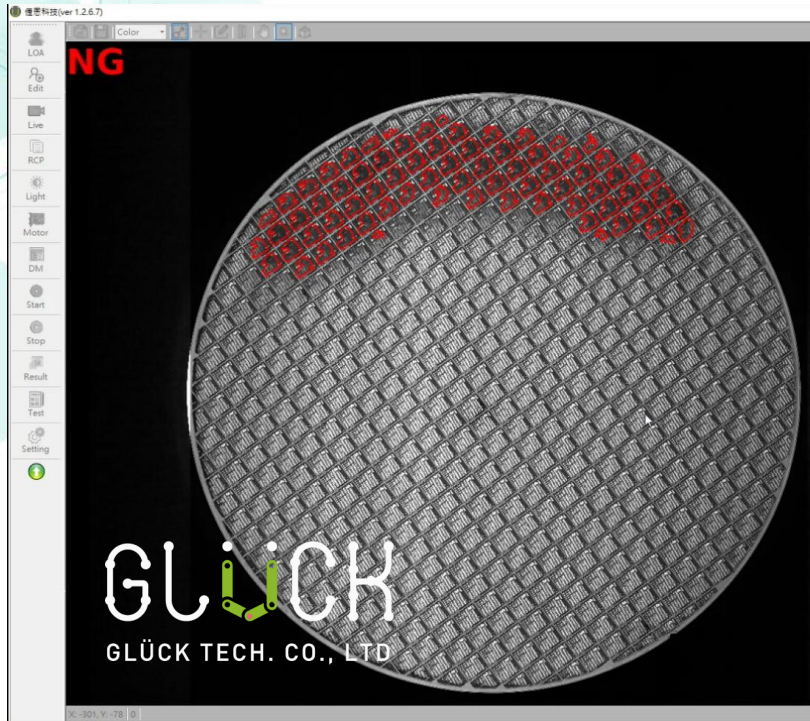
GLÜCK  
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# Wafer/IC defect detection

Combined with AI+AOI technology, it has the advantages of high hit rate and low overkill

- There is no need to train a golden sample in advance.
- Wafer defect detection to quickly locate defects



# Gluck AI random texture defect detection

Break through the limitations of traditional machine vision



Both white dirt and transparent residue can be detected

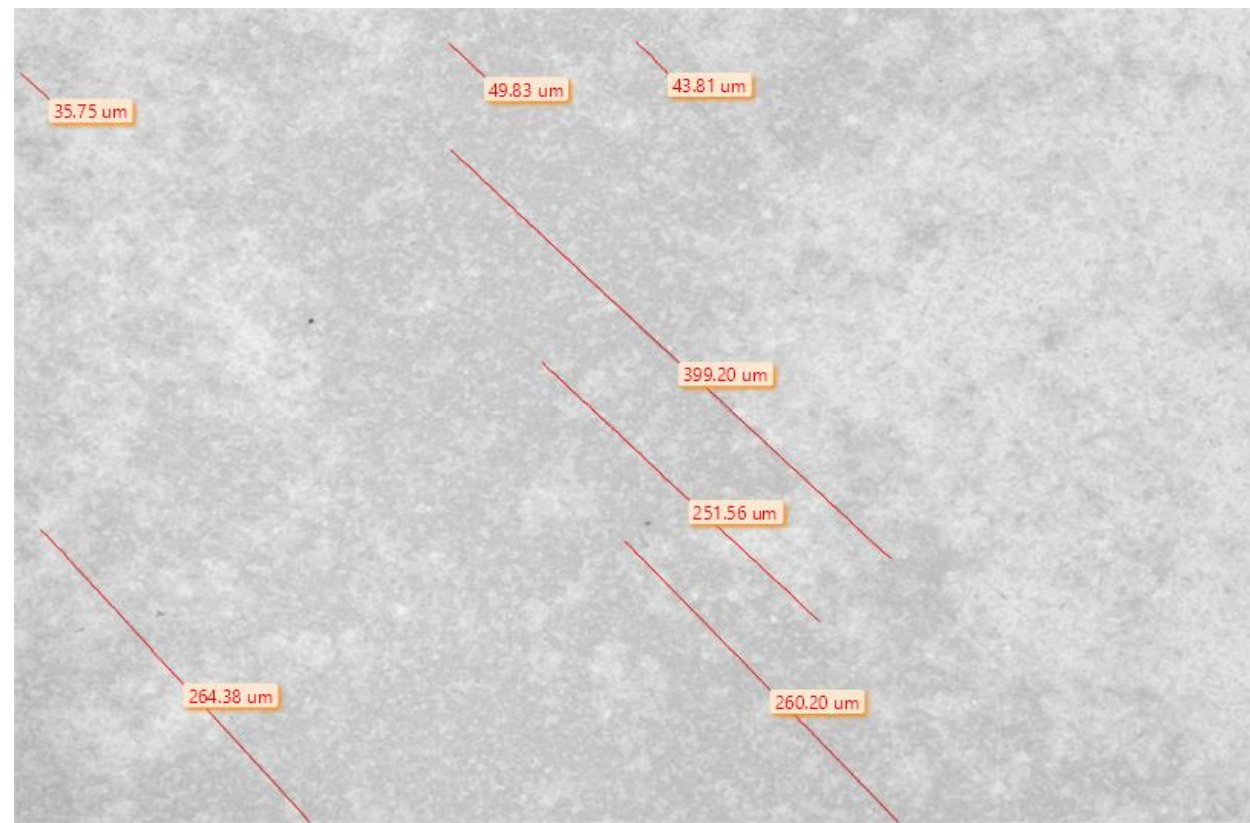


Rough surfaces with uneven light sources can also easily detect imperfections



# Gluck AI random texture defect detection

## Semiconductor Surface Scratch Detection



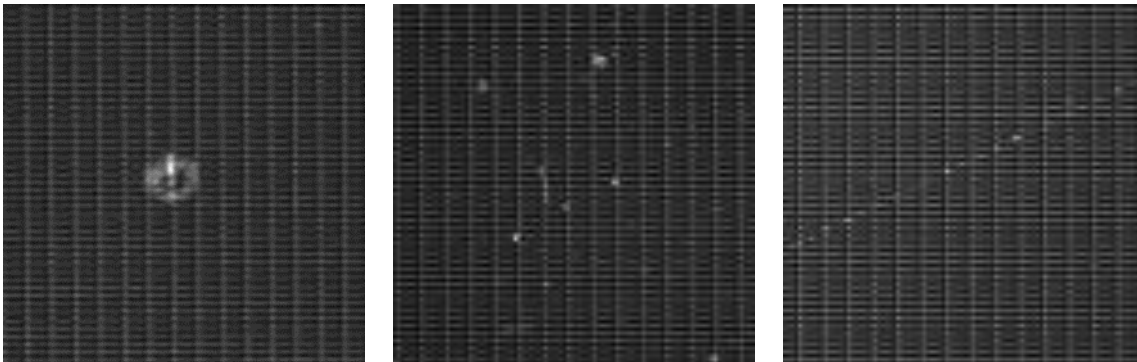
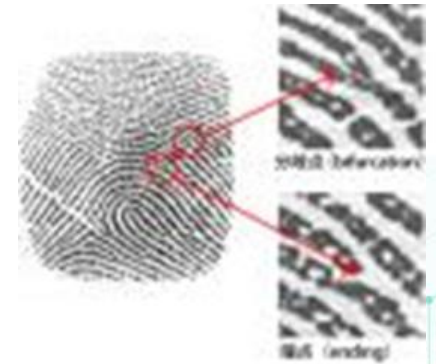


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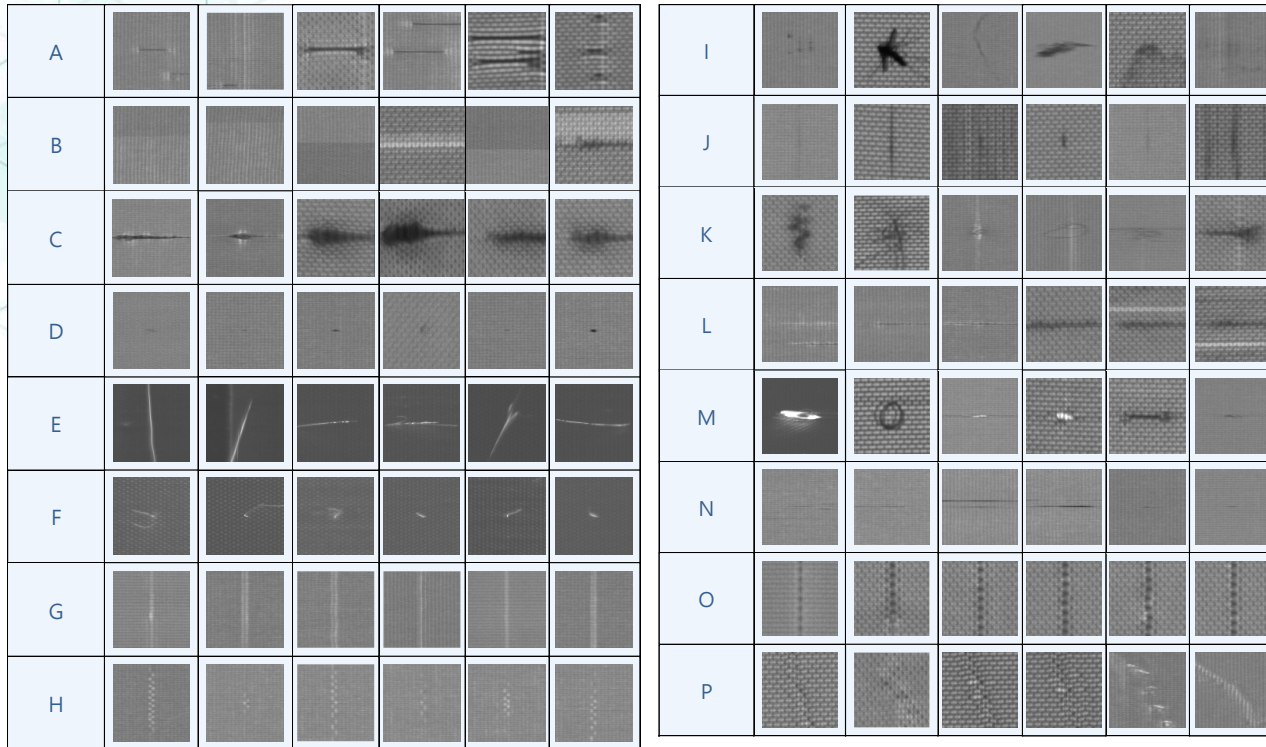
# Applications of Recognition/Classification

- Used to confirm the identity or kind of object.
- License plate recognition, barcode recognition, optical character recognition (OCR)
- Face recognition, fingerprint recognition
- Defect classification.
- Classification of Crop Pests and Diseases

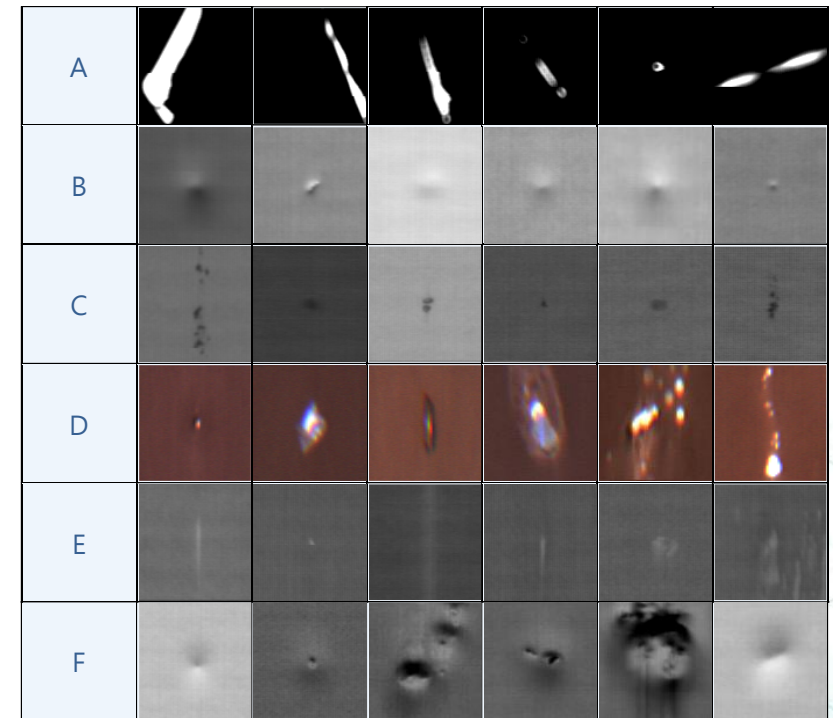


# Gluck AI defect classification statistics

- Find out the true defect and quantity of process defects



Textile surface imperfections



Metal processing surface defects



# Occupational Safety Equipment Recognition



# Monitoring for dairy cattle mating recognition

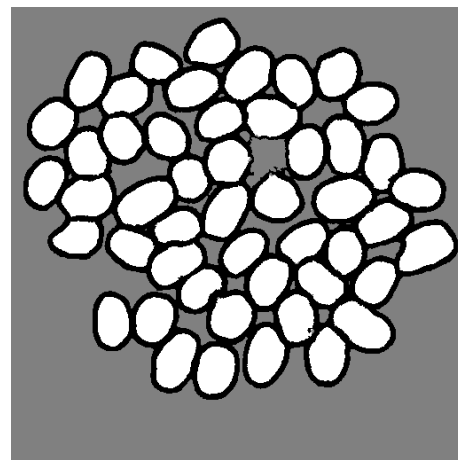
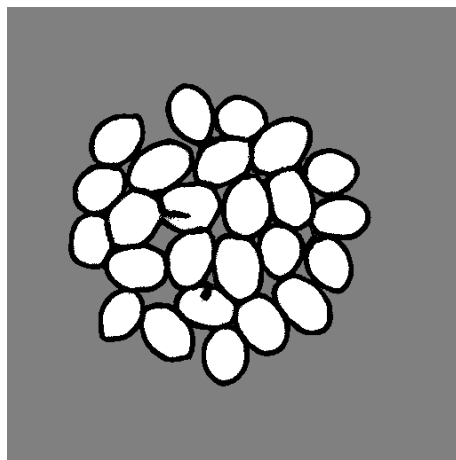
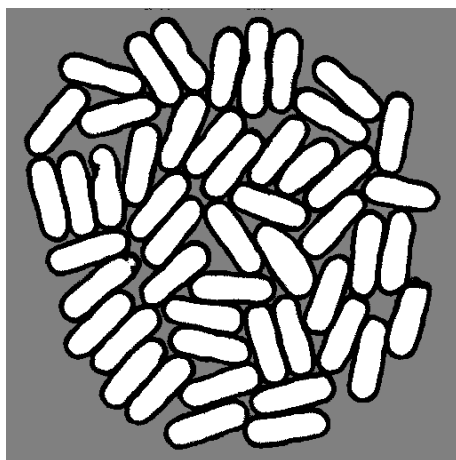
Accurately identifying the estrus period of cattle.

- Optimal mating at the right time.
- Increases the success rate of artificial insemination.
- Enhances milk production.

# Gluck AI - Count of products with non-fixed shapes



Original imagery

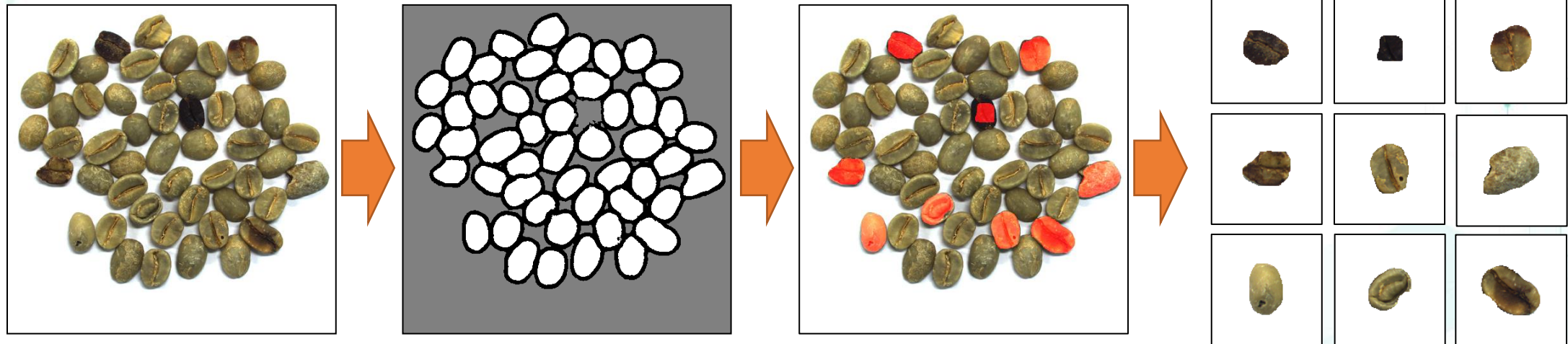


Count the results



# Classification of non-fixed shape products

- To solve the shortcomings of traditional reliance on golden samples
- Gluck AI is used to detect AI defects in samples that cannot be fixed in size, such as coffee beans.

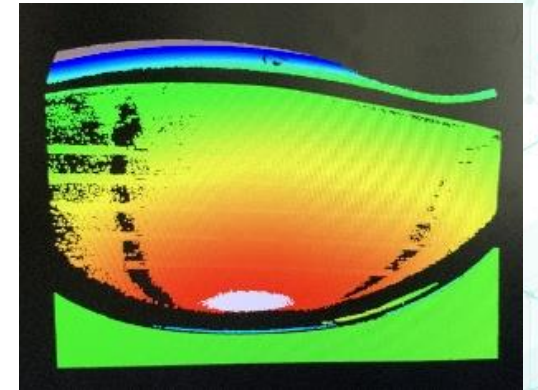
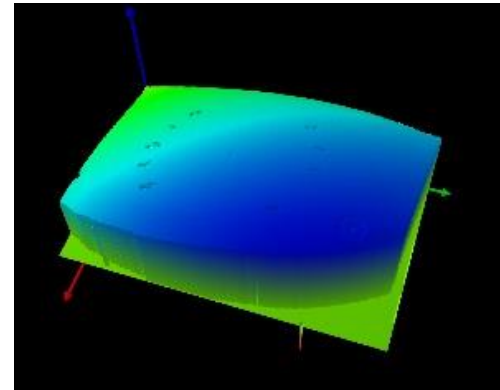
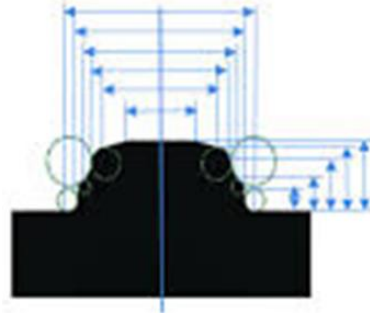
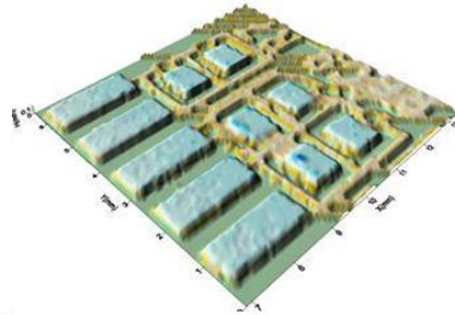
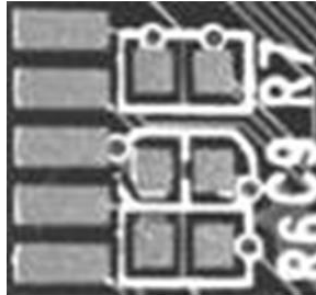


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# Applications of Measurement

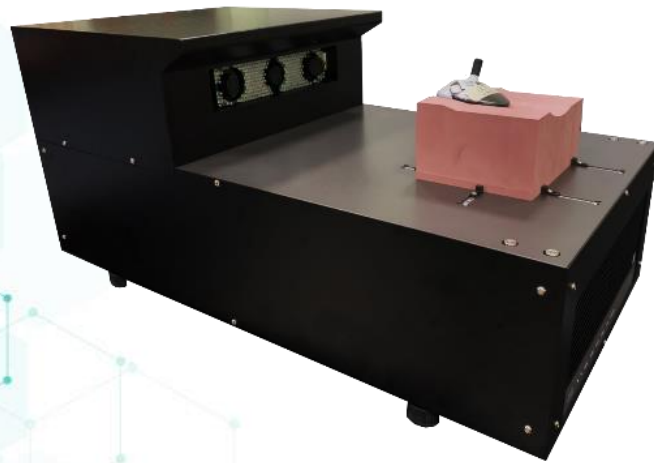
- Non-contact measurement with machine vision technology.
- For example, the size, angle, roundness of the workpiece and the line width of the printed circuit board.



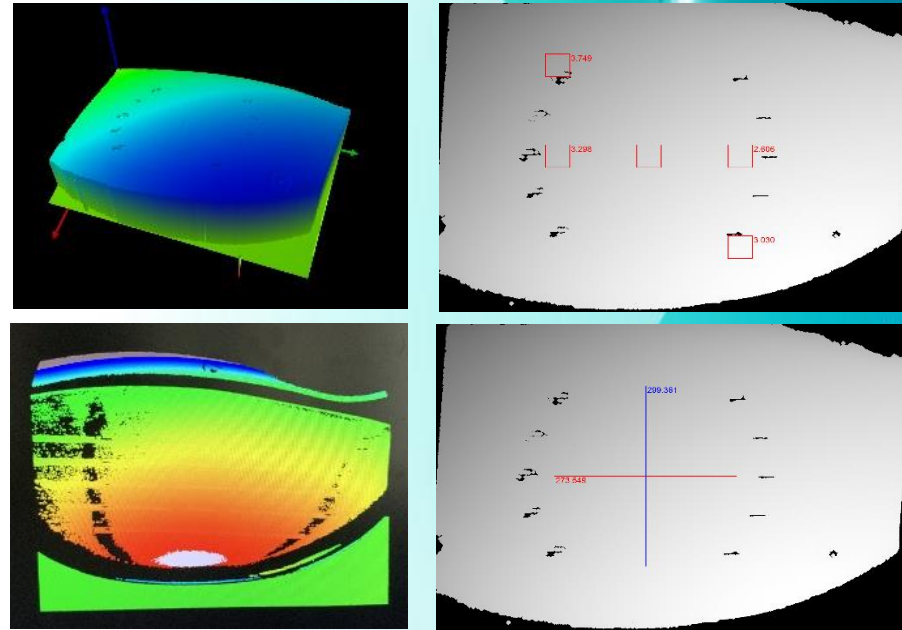


# Surface Measurement of Golf clubhead

- Measurement of normal vector clamping angles of surfaces
- Measurement of the radius of curvature of a surface



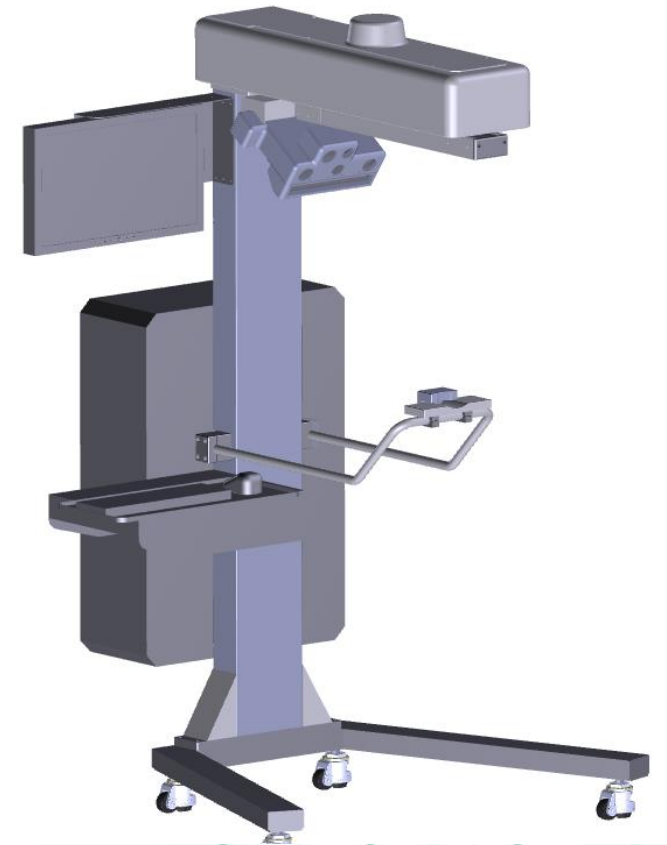
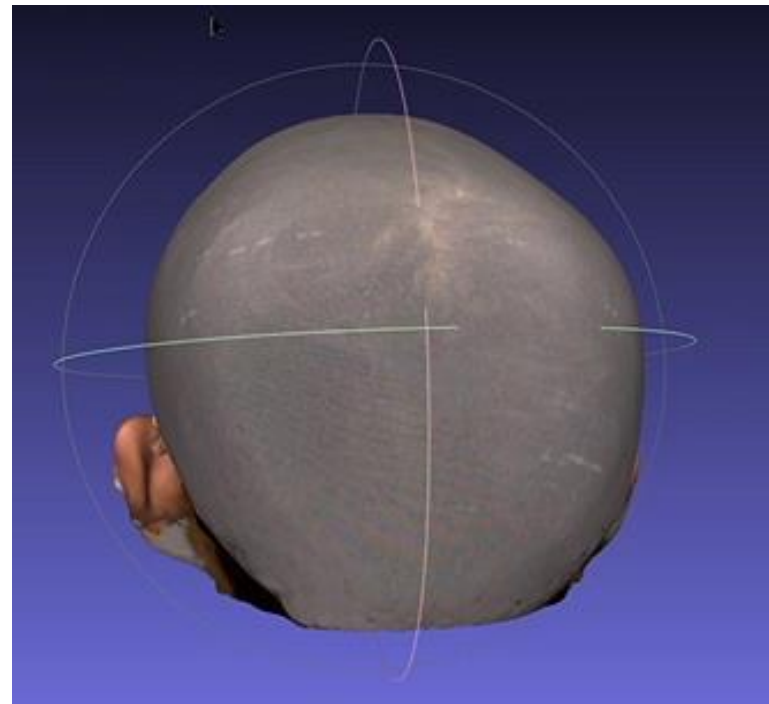
3D metrology equipment



The coordinates can be easily selected to calculate the normal vector angle

# Medical head-shaped 3D scanner

- Highly customized 3D modeling technology, fast mobile scanning, and real-time stitching.
- Integration of 3D+2D image information.
- Order data compilation and customized workflow.



# AOI module of PCR packaging line

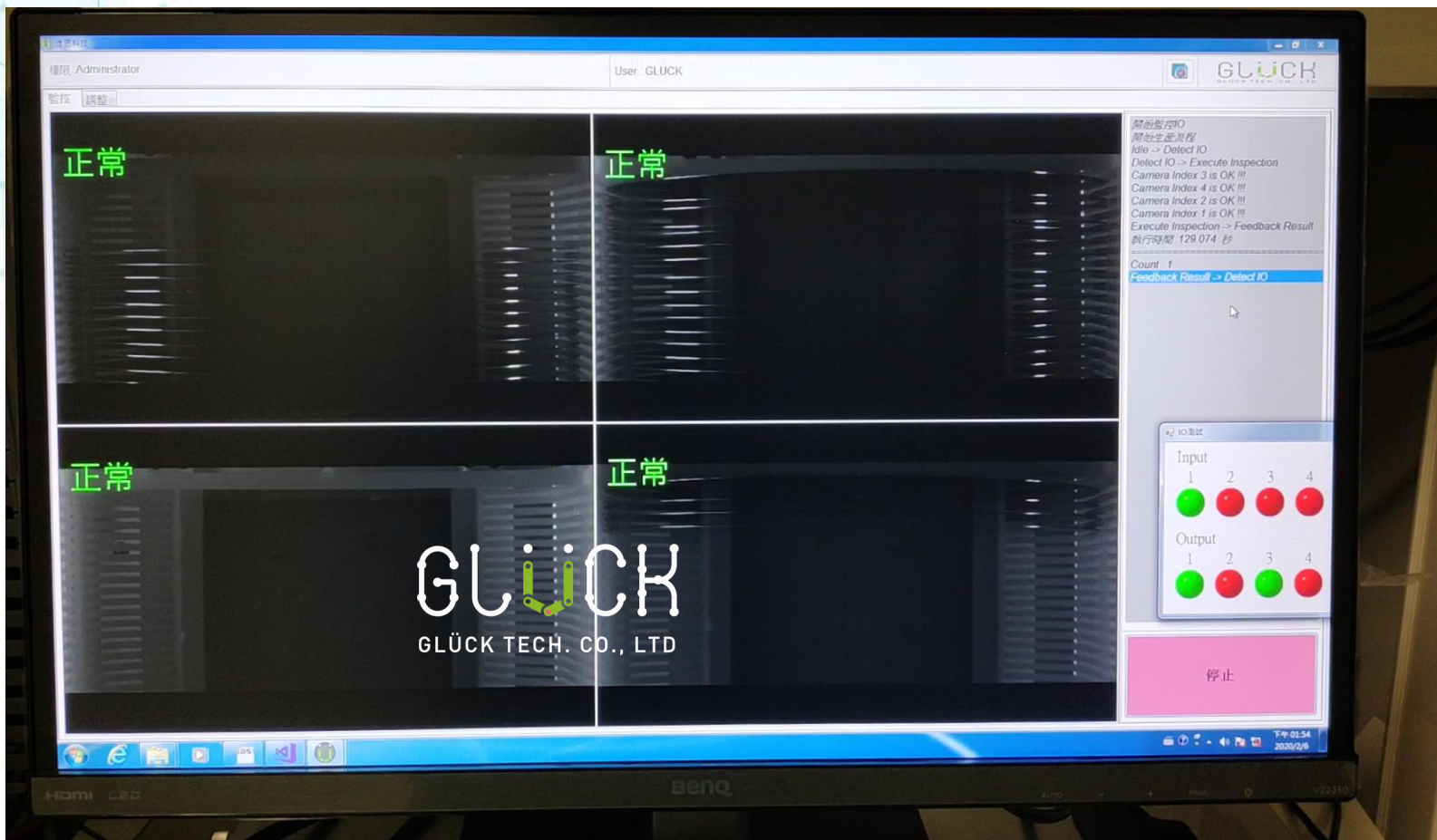
- Aluminum film sealing AOI technology
- Special lighting strategy to find the leakage of the seal
- Liquid level measurement





# Wafer overlap/oblique detection

- Reduce fragmentation occurrence



# Wafer crack detection

The image displays a software interface for wafer crack detection. The main window shows a live video feed of a stack of wafers. The word "異常" (Abnormal) is displayed in red at the top left of the video feed. Several horizontal lines are overlaid on the video: two green lines and two red lines. One of the red lines is broken, indicating a crack. A red rectangular box highlights the area where the crack is located. On the left side of the interface, there is a control panel with icons for "設定" (Settings), "連線" (Connect), "LIVE" (Live), "開始取像" (Start Imaging), "開始" (Start), and "關閉" (Close). The top right corner of the interface features the logo "GLUCK 健恩科技". On the right side, there is a 3D model of a wafer stack, which is a blue cylinder with horizontal lines representing the wafers. A red horizontal line is drawn across the middle of the 3D model, corresponding to the position of the crack in the video feed. At the bottom left of the interface, the coordinates "X: 7, Y: 73 | 0" are displayed. At the bottom of the interface, the text "權限: Administrator 使用者: GLUCK GrabTimes: 0 GetImages: 0" is visible.



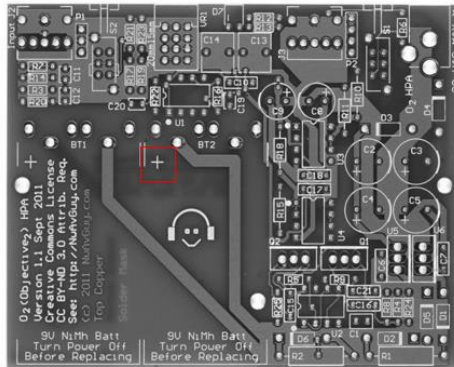
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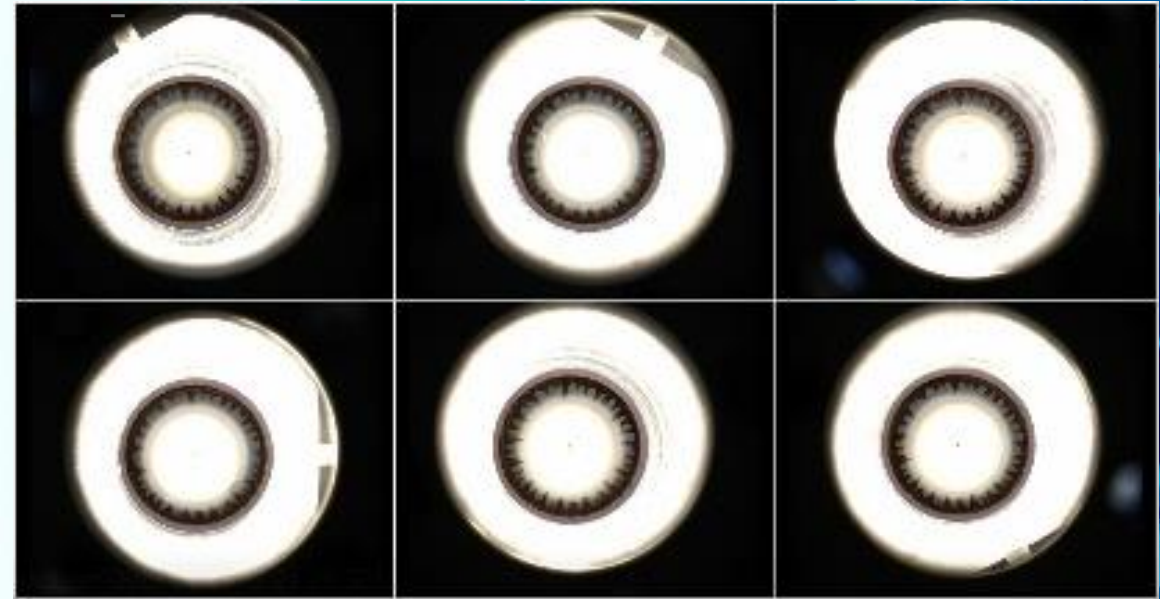
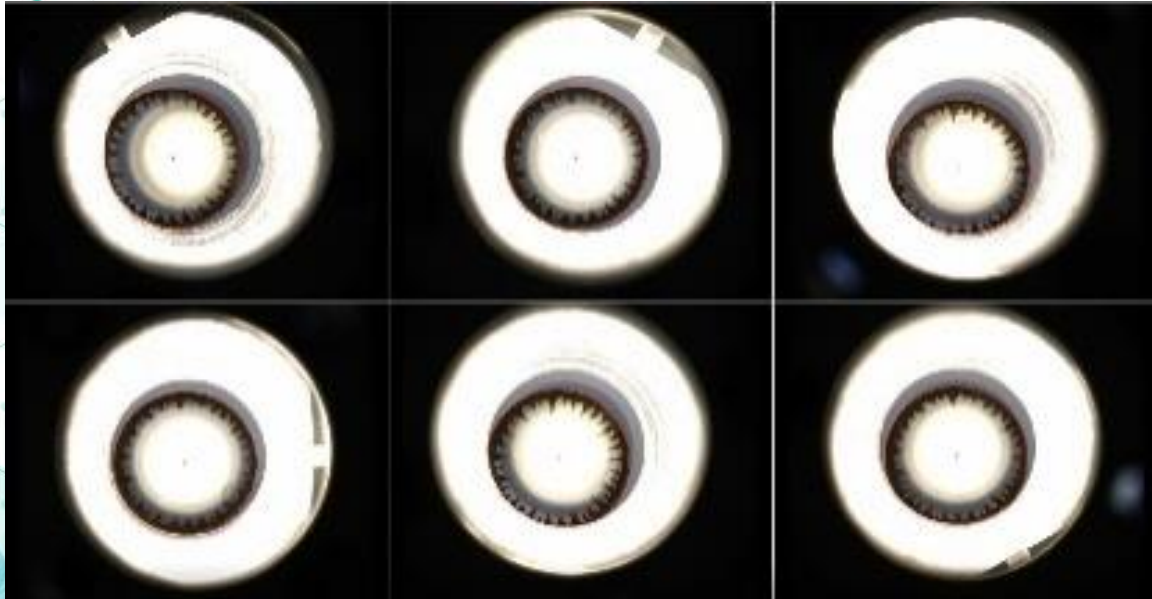
# Applications of positioning

- Use machine vision to guide the path of automated machines, such as guiding the path of the robot and the trajectory of the unmanned guided vehicle.
- It can also be used to determine the position of the target, such as SMT, PCB automatic assembly operation.
- The walking path of the robot.



# Contact Lens - Pad printing alignment

- Defect detection
  - Edges: missing, cracked, burr, jagged edges
  - Central optical zone: attachments, spots/stains, cracks, holes, bubbles
- Pad positioning
  - precision :  $\pm 10\mu\text{m}$ 
    - Various pattern colors are supported
    - In-line real-time monitoring



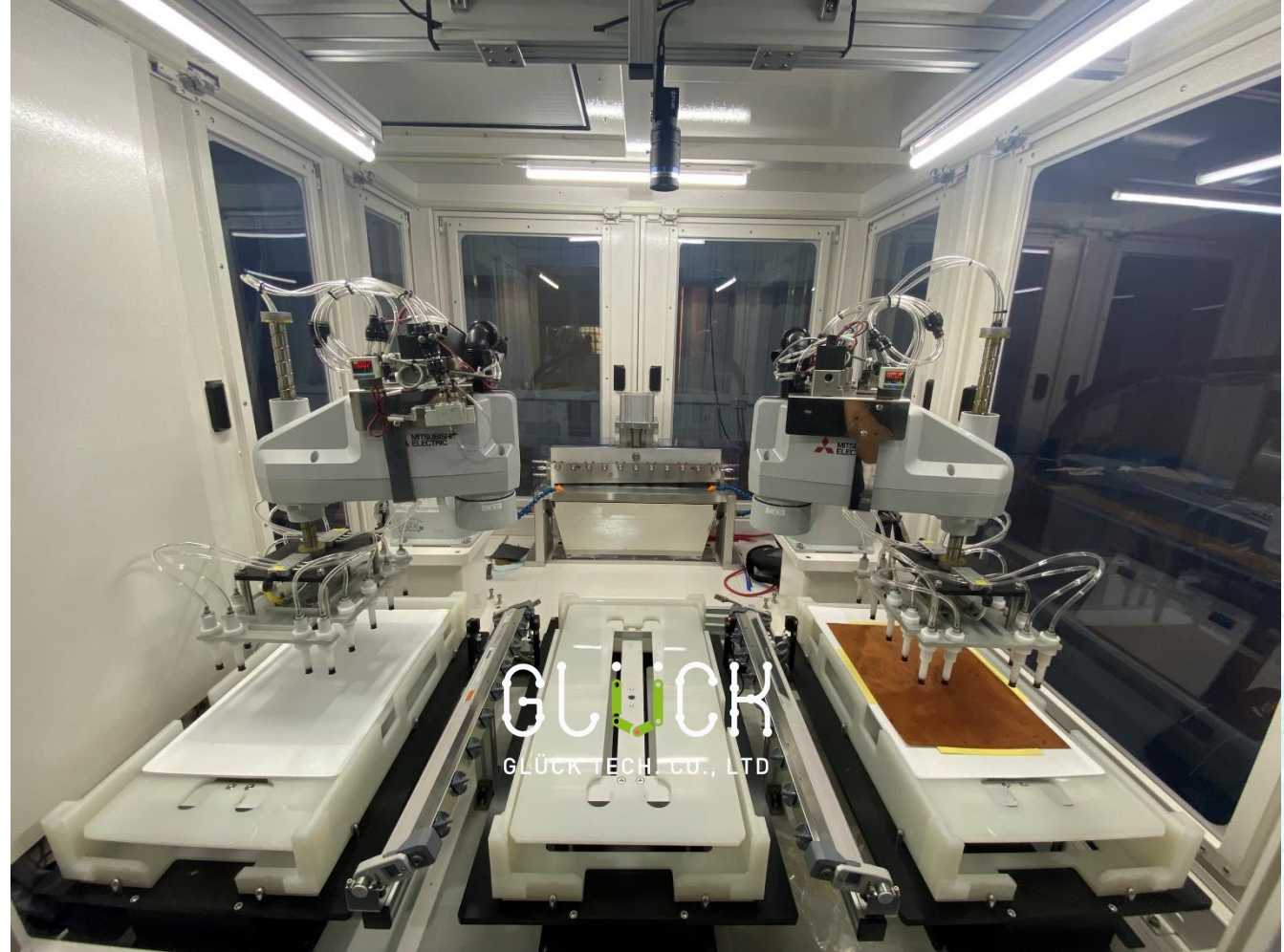
The pad printing position is skewed

Translocation correction



# Copper foil cutting - guide positioning

- Coarse positioning for pick and place
- Fine positioning for precision cutting
- Copper foil defect detection





# AI-based Autofocus System

編碼器：  
IE2-512



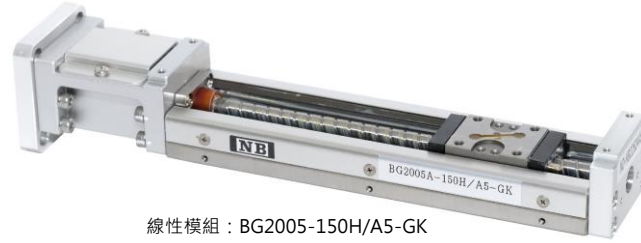
馬達：  
2224R012SR



減速機：  
22/5-69.2 : 1



聯軸器：  
XGT-19CS-4\*4



線性模組：BG2005-150H/A5-GK

控制器：MDCD 3003 S RS CC



微米級自動對焦&量測平台

The screenshot displays the GLUCK software interface with the following sections:

- Camera:** Grab, Stop buttons.
- Motor:** Z Axis, X Axis, Y Axis tabs. Connect (Baud Rate: 9600, Port: COM18, Stop), Write Info (Send, Speed: 5000, Stop), Movement (Home, Setting Home, Homing, Relatively, Move Pulse: 10000), Actually (Position: 0).
- Compare Setting:** AutoIncrement (Increment: 0, Set), CMP OUT (CMP Mode: Pulses output, Duty cycle: 0, Set), Value Set (Current Value: 0, Compare Value: 0, Compare Enable/Disable).
- Encoder:** X Encoder (Current Value: 94277, 4713 (um)), Y Encoder (Current Value: 0, 0 (um)), Z Encoder (Current Value: -428, -18 (um)), Compare (Compare Value: 1872).
- Focus Operation:** Info (Schematic Diagram, Info Value: Increment: 78, Range: 1000, Datum Point: 0, Duty\_Cycle: 100, Times: 20 DOF), Operation (Test, Region, Operate), Relative Height (Region A, Region B, Operate), Stop.
- Result:** Position: -1 (0 um), Focus Value: -1, Height: 0 um, Time(S): 0.361, Image Count: 0.

GLUCK  
GLÜCK TECH. CO., LTD

# Gluck's AI+AOI solutions

## Semiconductor

- Microscope-specific AI autofocus
- Wafer macro defect AOI inspection
- Wafer oblique insertion detection /positioning/measurement
- Wafer quantity/stack detection/OCR applications

## FPD

- LED/ $\mu$ LED panel inspection
- FPD circuit LINE SCAN inspection
- Polarizer/film AOI inspection

## PCB

- Mask/SMT stencil AOI inspection machine
- Copper foil/battery film alignment and cutting
- 3D height measurement module
- IC bonding positioning

## Customized AI+AOI

- Medical powder inspection equipment
- Medical drug automatic supply equipment
- Industrial AI inspection and classification module
- Visual guidance positioning module

# Thank You

GLiICK

健恩科技



# OT大講堂

每週10堂OT應用主題

週二10:00~週五17:00

 AGV

 AOI

 機械手臂

 機聯網

 能源管理

 元宇宙

 系統整合

 刀具管理

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方案類別

數位科技  數位智  智能儲運  討論  智能品質

整線自動化  上下料  智能加工  物件辨

**需求諮詢單**

諮詢內容

可輸入 500 字

留言

0則留言

我想了解

**留言**

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分享



# 加入就享知，獲取第一手OT資訊

訂閱 OT大講堂 頻道，即時掌握產業最夯OT新知

