
FabGoalie Ai
Smart Fabric Goalie

New Technology Innovation

In the fast-paced modern textile production industry, fabric quality inspection has always been a critical factor in enhancing product competitiveness. However, traditional manual inspection is limited by human visual reaction time and fatigue, making it difficult to maintain long-term, uninterrupted, and efficient performance. To reduce the burden of manual inspection and lower operational costs, the industry is increasingly shifting towards advanced AI-based defect detection technologies. In response to this trend, we have developed the **Smart Fabric Goalie** system, specifically designed for automated AI fabric defect detection, offering a continuous and precise solution for flaw identification.

AI Defect Detection Principle

Deep Learning Technology

This system utilizes deep learning neural networks to train on a large dataset of fabric images, enabling the recognition of subtle and diverse defects. It effectively overcomes the limitations of manual inspection while significantly enhancing detection accuracy and efficiency.

Automated Inspection Process

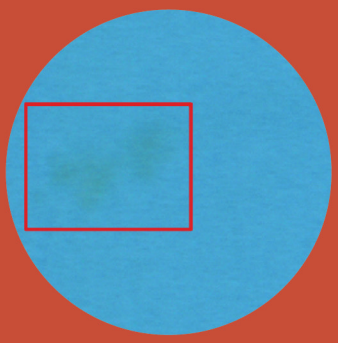
Compared to traditional manual inspection, the AI system is capable of continuous operation, allowing for real-time and year-round fabric detection. This not only enhances production efficiency but also ensures consistency and stability in the inspection process.

Diverse Defect Recognition

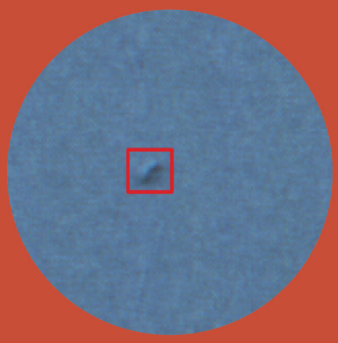
This system effectively detects and marks common fabric defects, such as hooked yarn and oil stains, making it suitable for quality inspection of various textiles. As the system continues to optimize, it will develop the capability to identify even more types of defects in the future, providing comprehensive quality assurance for production.

Smart Adaptation and Customization

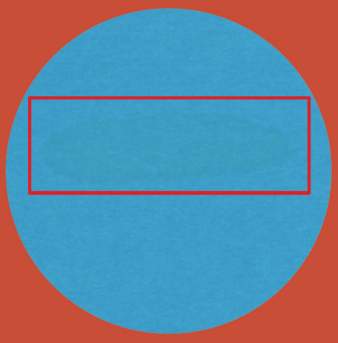
The machine adopts a modular design suitable for different production layouts — including fabric entry, automatic inspection, and fabric exit stages. The flexible configuration can be customized for different fabric widths and installation environments. It can be integrated into existing production lines to achieve stable, high-efficiency, and reliable inspection performance.



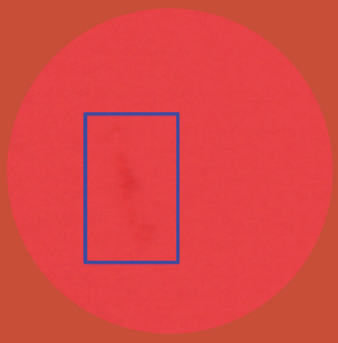
Type: Oil stain
Width: 23.32 mm
Height: 15.18 mm
Area: 354 mm^2



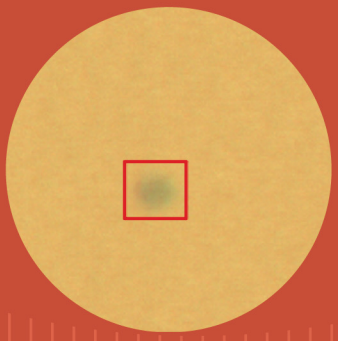
Type: Hooked yarn
Width: 4.4 mm
Height: 4.18 mm
Area: 18.39 mm^2



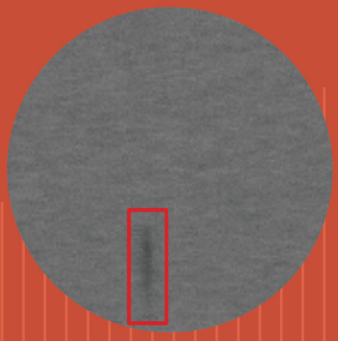
Type: Waterish
Width: 45.1 mm
Height: 12.98 mm
Area: 585.4 mm^2



Type: Color stain
Width: 8.8 mm
Height: 14.74mm
Area: 129.71 mm^2



Type: Color spot
Width: 6.16 mm
Height: 5.72 mm
Area: 35.24 mm^2



Type: Tissue oil
Width: 7.04 mm
Height: 5.94 mm
Area: 41.82 mm^2

Smart Fabric Goalie Defect Detection Examples

Comprehensive Data

The defect report lists the location, size, and area of defects, as well as the associated penalty points, providing precise defect information.

Accurate Positioning and Classification

Defects are identified and categorized by their longitudinal position and type, allowing for easy report export and quality control.

Defect Size and Area

Provides detailed information on defect dimensions and area, assisting with shipment management and product evaluation.

Customized Scoring System

The system supports flexible grading and scoring based on inspection standards, and can be adjusted according to customer requirements.

Easy Tracking

Defect reports can be exported for customer review, enabling convenient post-inspection analysis, consultation, and quality traceability.

Integration with ERP and MES Systems

The system supports seamless data integration—defect reports and inspection images can be automatically linked to factory management systems, enabling real-time feedback and efficient quality tracking.

Defect Report ：F1835 Visualized Chart

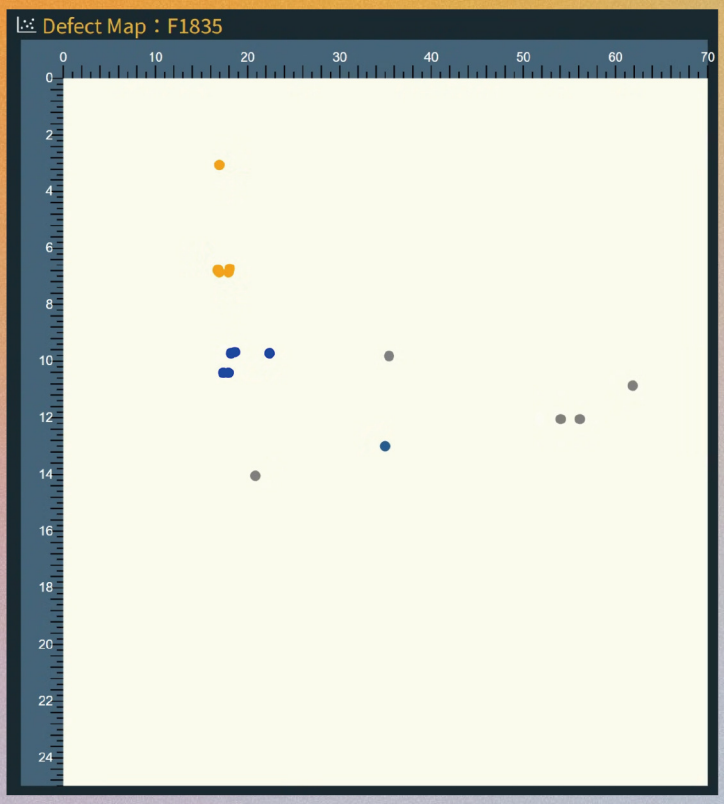
Defect Number	Horizontal Length (Inch)	Vertical Length (Yard)	Type	Defect Width mm	Defect Height mm	Defect Area mm²	Penalty
1	17.19	3.16	T2	5.5	11.0	60.5	1
2	18.31	6.99	T2	10.12	21.12	213.73	1
3	17.15	7.02	T2	28.38	9.02	255.99	1
4	17.17	7.04	T2	29.04	29.92	868.88	1
5	17.11	7.1	T2	31.68	35.42	1122.11	1
6	17.3	7.13	T2	22.44	19.58	439.38	1
7	18.21	7.14	T2	15.4	5.94	91.48	1
8	18.89	10.05	V9	7.92	7.92	62.73	1
9	18.59	10.07	V9	14.08	7.04	99.12	1
10	22.78	10.09	V9	5.5	3.52	19.36	1
11	36.03	10.2	VC	3.74	3.3	12.34	1
12	17.64	10.79	V9	5.06	7.04	35.62	1
13	18.25	10.8	V9	5.06	3.08	15.58	1
14	62.84	11.25	VC	7.48	3.96	29.62	1
15	54.89	12.48	VC	2.86	2.2	6.29	1
16	57.0	12.49	VC	2.86	2.2	6.29	1
17	35.57	13.47	AJ	4.18	2.2	9.2	1
18	21.22	14.54	VC	2.86	1.54	4.4	1

Unified Color Coding for Defect Types

ID	Defect Code	Defect Type	Indicating Color	Indicating Marker
1	WA	Hooked Yarn	red	
2	AF	Broken Yarn	chocolate	
3	AE	Hole	aqua	
4	V9	Oil Stain	blue	
5	VC	Color Spot	springgreen	
6	T2	Color Stain	PeachPuff	
7	W5	Dirty	darkorange	
8	V5	Waterish	violet	

By standardizing defect classification through color marking, different defect types can be quickly identified, enhancing readability and operational efficiency.

Defect Map with Interactive Tables
Clear Visibility of Defect Point Information



Precise Positioning
Users can accurately locate defect positions, facilitating correction and handling.

Color Differentiation
Different colors allow for quick identification of defect types and distribution areas.

Data Visualization
Combining charts and data makes quality management more efficient.

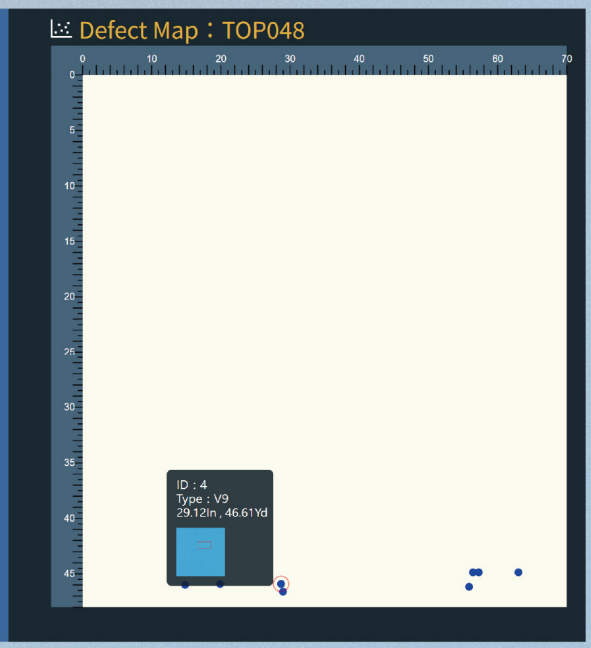
Real-Time Interaction
Clicking or hovering reveals detailed defect information, enhancing usability.

Defect Report ：TOP048

Visualized Chart

Defect Number	Horizontal Length (Inch)	Vertical Length (Yard)	Type	Defect Width mm	Defect Height mm	Defect Area mm²	Penalty
1	63.9	45.49	V9	7.48	6.16	46.08	1
2	58.07	45.53	V9	21.12	13.64	288.08	1
3	57.3	45.53	V9	17.6	15.62	274.91	1
4	29.12	46.61	V9	31.46	14.74	463.72	1
5	20.17	46.62	V9	24.2	12.1	292.82	1
6	15.17	46.62	V9	18.04	17.6	317.5	1
7	56.65	46.87	V9	50.6	22.66	1146.6	1
8	29.51	47.28	V9	30.14	20.02	603.4	1

Show Defect Code Table



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System Interface

Quick Device Switching

By scanning a QR code, users can swiftly switch to mobile devices such as smartphones or tablets.

Enhanced Work Efficiency

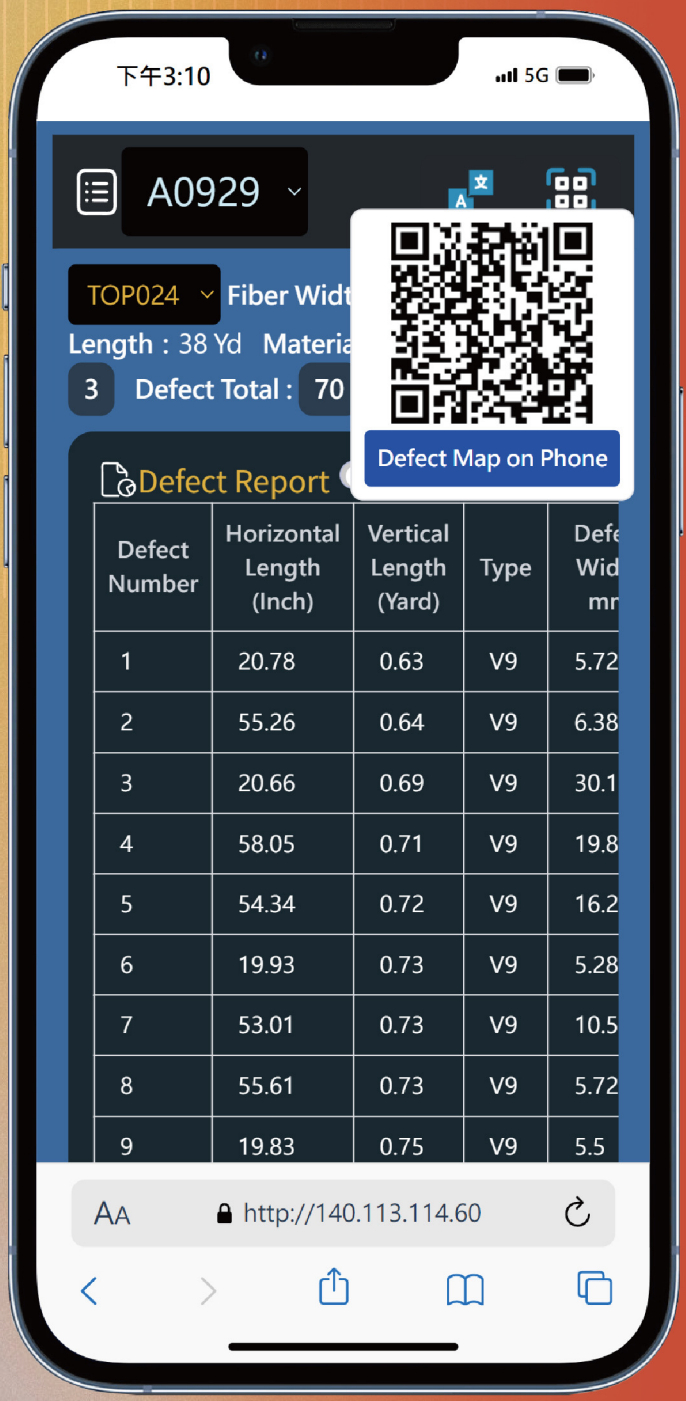
Supports simultaneous access across multiple devices, allowing staff to view and analyze inspection reports anytime.

Improved User Convenience

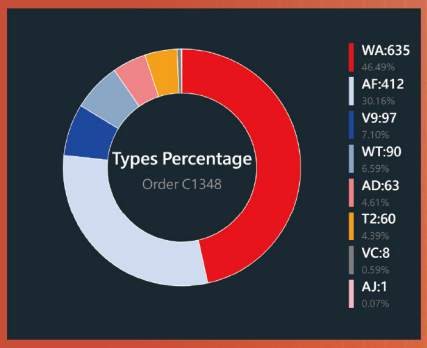
The system offers flexible and user-friendly access, enabling seamless switching and analysis across different devices.

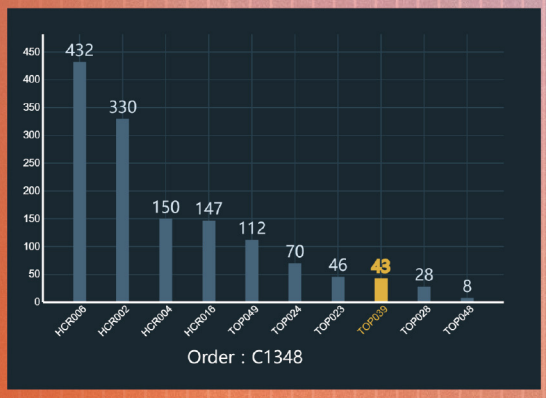
Cross-Device Collaboration

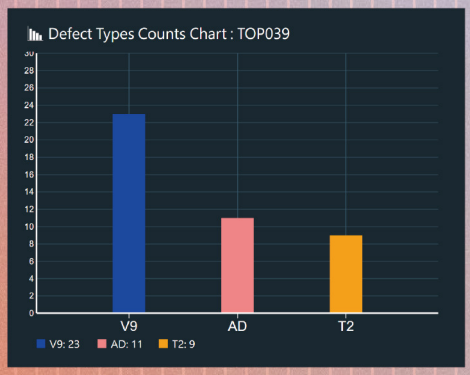
Teams can view reports simultaneously from different locations, overcoming communication barriers and improving coordination.



Diverse Chart Analysis

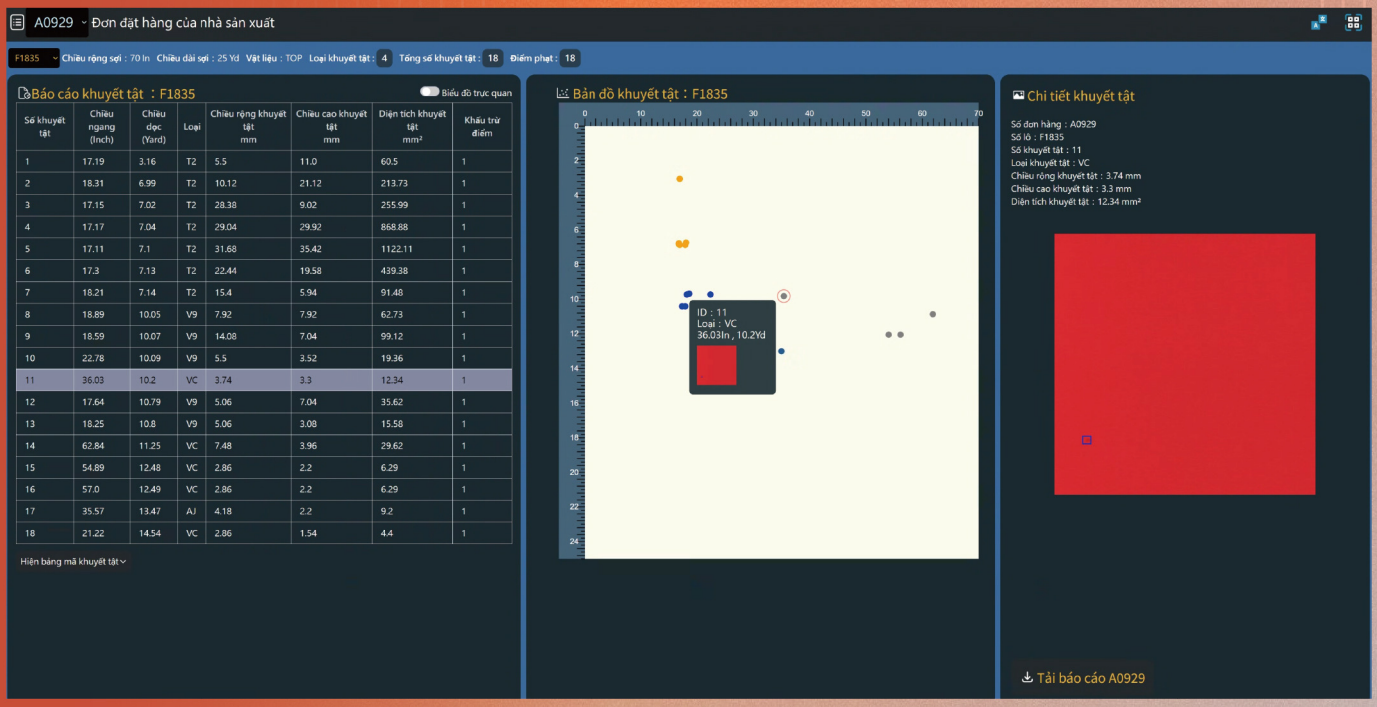






The system provides various analytical charts with distinct colors and clear data labels. These visualized reports allow users to easily grasp defect categories and quantities, facilitating quick decision-making and efficient production management.

Customizable Multilingual Interface



Users can select their preferred language from the menu or switch seamlessly between multiple languages such as Chinese, English, and Vietnamese. The system interface can also be customized based on user language preferences, providing a user-friendly experience tailored to different regional needs.

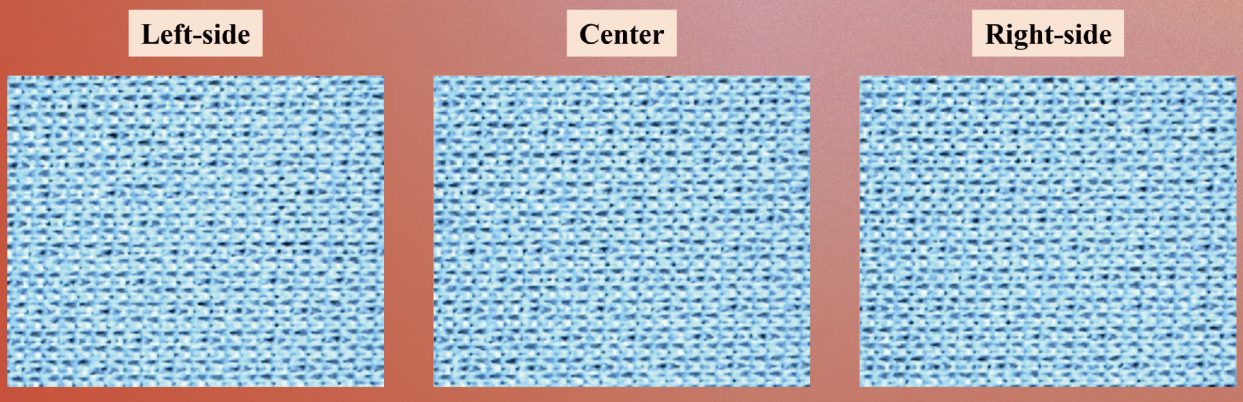
Color Inconsistency Inspection

Intelligent Color Detection

The system is equipped with a high-precision RGB color measurement camera that captures fabric surfaces in real time through continuous motion imaging. By comparing left, center, and right regions of the fabric, it quickly identifies potential color inconsistencies.

Image Processing Analysis

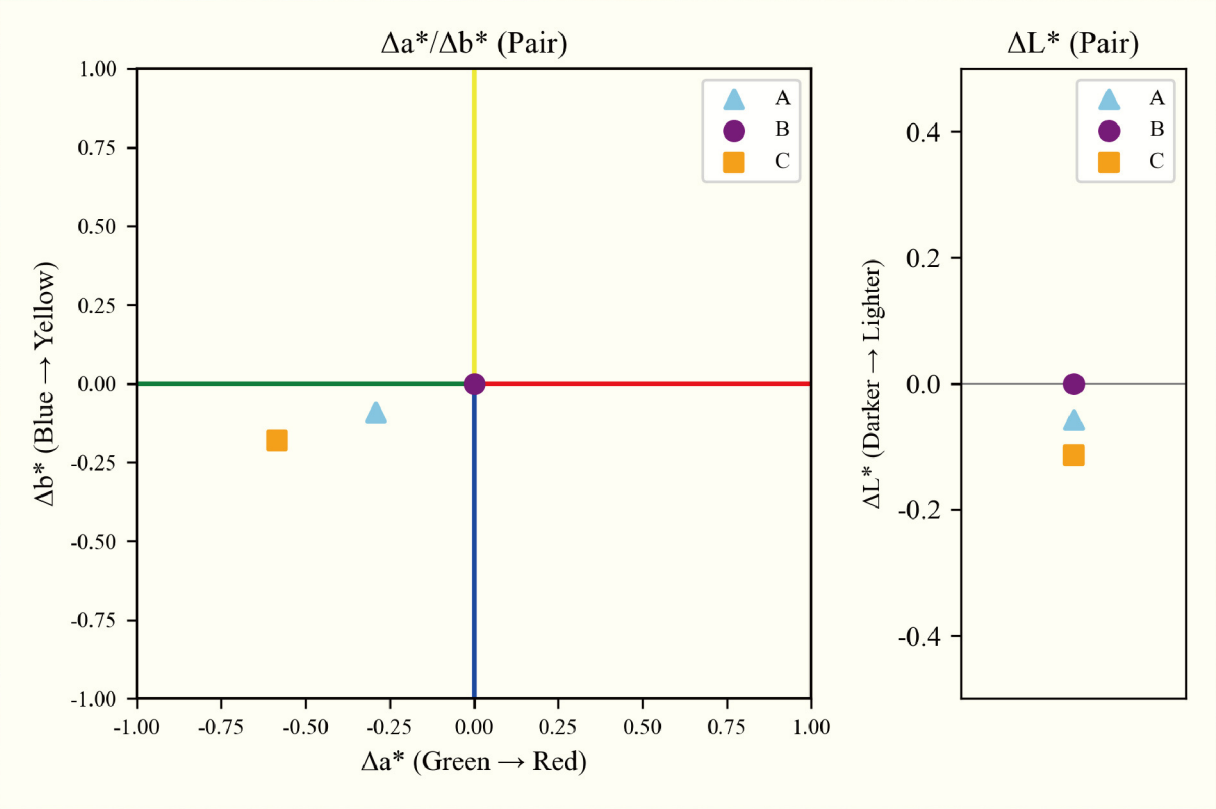
By integrating image processing algorithms, the system establishes a standardized inspection workflow. Color inconsistencies are quantified and visualized, ensuring consistent and stable fabric quality across production.



The system utilizes a high-precision RGB color measurement camera to perform dynamic area scanning on textile surfaces (left, center, and right regions), enabling immediate detection and recognition of potential color inconsistencies.

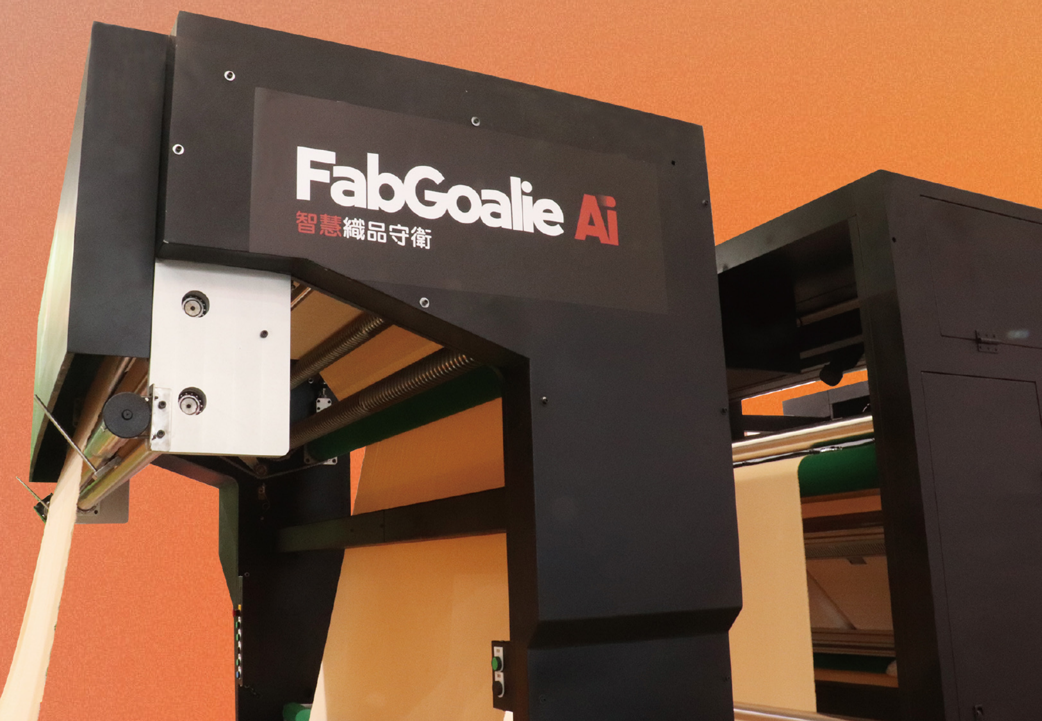
Pair	ΔE CMC
A vs B	0.20
C vs B	0.39
A vs C	0.19

During the fabric inspection process, the system continuously captures regional RGB values and calculates color difference (ΔE) values according to international standards. The quantified results are presented in tabular and graphical form, providing fast and accurate judgment references that help manufacturers monitor fabric color consistency in real time.



The system also integrates the CIE Lab color model to visualize color inconsistencies. By converting abstract numerical data into intuitive color difference graphs showing chromaticity and brightness variations, users can clearly compare color discrepancies between regions—ensuring consistent overall fabric quality.

FG1-T2T



Machine Specifications

Trolley to Trolley

Dimensions:
523 × 288 × 262 cm

Intelligent Inspection Process	Smart inspection algorithms reduce human judgment errors and improve inspection precision and consistency.
High-Speed Detection	Capable of operating at speeds up to 60 yards per minute, suitable for large-scale fabric inspection.
Knitted/Woven Fabric Compatibility	Applicable to both knitted and woven fabrics, providing flexible adaptability for various material requirements.
Synchronization Control	Precise tension synchronization ensures stable fabric feeding during the inspection process.
Tension Control	Advanced tension regulation maintains even fabric tension and consistent results throughout the inspection.
Instant Feedback	Real-time inspection feedback enables immediate parameter adjustment and defect tuning.
Optical Annotation	Combining an optical annotation system for precise defect localization, enhancing inspection efficiency.
Modular Design	Modular configuration allows flexible adjustments based on different fabric characteristics, ensuring stable and accurate inspection performance.

Optical Structure

Line Scan Camera	8K
LED Linear Light	Maximum 1,600,000 Lux
Focal Length	14mm
Aperture	f/2.8~f/22
Working Distance	28cm~
Camera Configuration	Color Camera: 4 units

Linear Light

Light Source Brightness	Maximum 1,600,000 Lux
Resolution	0.217mm
Minimum Defect Size	0.28mm
Image Processing System	Workstation-level Computer

Optical Marking System

Power	30W
Speed	2000mm/sec
Marking Range	100x100mm
Power Supply	Single-phase AC 220V, Power Consumption 1000W

FG1-12R

Machine Specifications

Trolley to Roll

Dimensions:
523 ×300 × 210 cm

Intelligent Inspection Process	Automated inspection and smart analysis ensure consistent high-quality results even during high-speed continuous production.
High-Speed Detection	Operates at speeds up to 30 yards per minute, supporting long-duration continuous inspection and production.
Knitted/Woven Fabric Compatibility	Compatible with both knitted and woven fabrics, offering flexibility for various material requirements.
Dedicated Rolling Control	Specialized rolling control system ensures stable and uniform tension during fabric winding.
Tension Control	Advanced tension regulation maintains even fabric tension and consistent results throughout the inspection.
Instant Feedback	Real-time inspection feedback enables immediate parameter adjustment and defect tuning.
Optical Annotation	Combining an optical annotation system for precise defect localization, enhancing inspection efficiency.
Modular Design	Modular configuration allows customization based on fabric type, ensuring precise and stable rolling and inspection operations.

Optical Structure

Line Scan Camera	8K
LED Linear Light	Maximum 1,600,000 Lux
Focal Length	14mm
Aperture	f/2.8~f/22
Working Distance	28cm~
Camera Configuration	Color Camera: 4 units

Linear Light

Light Source Brightness	Maximum 1,600,000 Lux
Resolution	0.217mm
Minimum Defect Size	0.28mm
Image Processing System	Workstation-level Computer

Optical Marking System

Power	30W
Speed	2000mm/sec
Marking Range	100x100mm
Power Supply	Single-phase AC 220V, Power Consumption 1000W

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