

聰明眼：人工智能紡織品檢測系統

WiseEye: AI-based Textile Material Inspection System

利用人工智能機器視覺及深度學習技術實時偵測紡織品瑕疵

Real-time detection of fabric defects using AI-based machine vision and deep learning technologies

專利申請編號: 201721439115.6 (中國)

特色與優點

- 結合人工智能、深度學習的機器視覺技術
- 令織物的製造和檢測程序可同步進行
- 能與任何織布機相容，包括全球正在運作的數百萬台織布機
- 能配合最高速的織布速度使用
- 能辨認約40種常見的織物瑕疵
- 精確度極高，檢測準確度達百分之九十以上

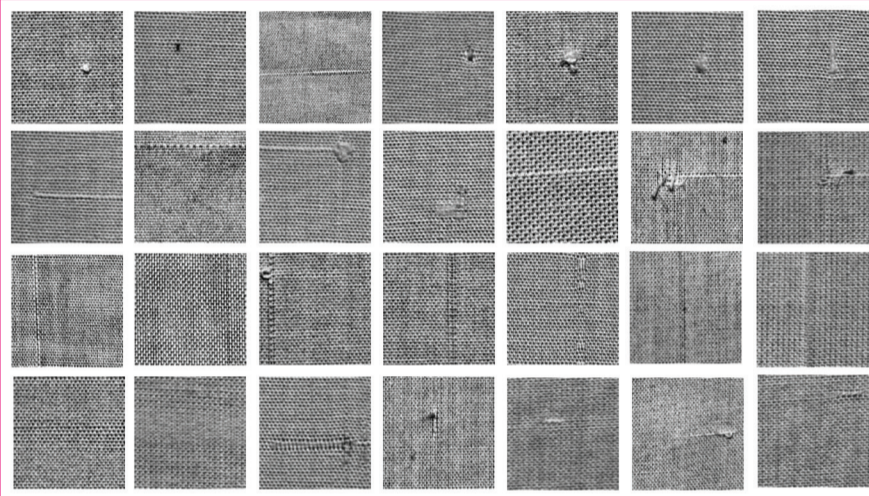
應用

- 實時織物品質及瑕疵檢測，適用於大部分紡織結構及顏色的織物
- 其他工業的產品檢測

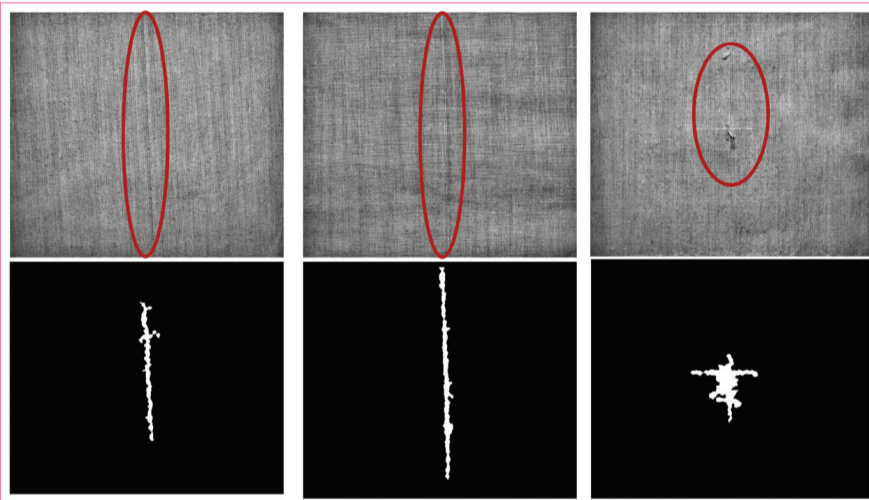
獎項

- 意大利代表團特別大獎 (2019年4月)
- 羅馬尼亞克盧日納波卡工業大學特別大獎 (2019年4月)
- 第47屆瑞士日內瓦國際發明展 - 評判特別嘉許金獎 (2019年4月)
- 羅馬尼亞錫比烏協會優異獎(2019年4月)

「聰明眼」能把品質控制過程完全自動化。在紡織過程中，系統的高功率LED燈條和高解像度感光耦合元件相機於軌道上來回移動，以拍攝整幅織物的圖像。圖像經人工智能機器視覺算法處理後，會被實時發送至電腦系統，以辨認瑕疵和其位置。如發現瑕疵，系統會發出警報。「聰明眼」結合了人工智能、大數據和深度學習技術，可檢測出約四十種常見的織物瑕疵，精確度極高，檢測準確度達百分之九十以上。



檢測結果例子
Examples of detection results



由「聰明眼」檢測出的瑕疵例子
Examples of defects detected by "WiseEye"

"WiseEye" can fully automate quality control for the textile industry. Equipped with a high-power LED light bar and a high-resolution charge-coupled device camera, "WiseEye" moves back and forth on a rail to capture images of the whole width of fabric during the weaving process. After being processed with an AI-based machine vision algorithm, the captured images are sent to a computer system in real time for identifying defects and their locations. Alerts are given out when defects are detected. Integrating artificial intelligence, Big Data and deep learning technologies, the system can detect around 40 common fabric defects with over 90% detection rate.



安裝於織布機上的「聰明眼」
"WiseEye" integrated on a weaving machine

Patent Application No. and Country: 201721439115.6 (China)

Special Features and Advantages

- Integrated AI-based machine vision technology and deep-learning technique
- Enables simultaneous implementation of fabric manufacturing and inspection
- Compatible with any weaving machines, including a few million operating weaving machines in the world
- Compatible with the highest weaving speed setting of existing weaving machines
- Capable of detecting around 40 common fabric defects
- Highly accurate with 90% detection rate

Applications

- Real-time fabric quality inspection and defect detection, suitable for fabrics with most weaving structures and colours
- Real-time product inspection for other industries

Awards

- Prize of the Italian Delegation of the Exhibition, Italy (Apr 2019)
- Prize of the Technical University of Cluj-Napoca of Romania (Apr 2019)
- Gold Medal with the Congratulations of Jury – 47th International Exhibition of Inventions of Geneva, Switzerland (Apr 2019)
- Special Merit Award from Romanian Association for Alternative Technologies Sibiu, Romania (Apr 2019)

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