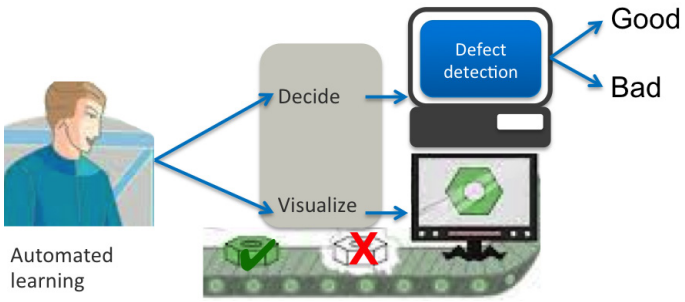
EagleEye glass setup

Automated quality control of watch parts

EagleEye: A visual platform for defect detection

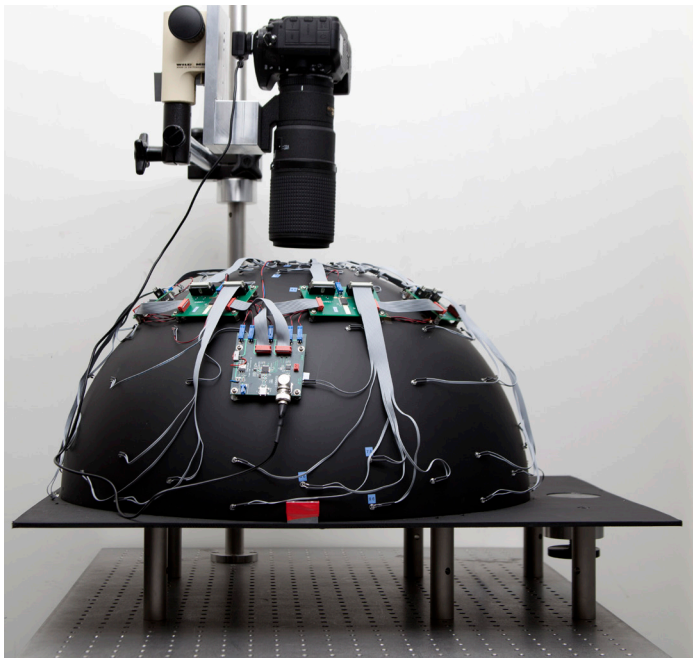
EagleEye is a vision system designed to acquire and classify images of small watch parts with various illumination angles. The goal is to detect the smallest defects on specific watch parts using analysis and machine learning algorithms.

The EagleEye system is an automated quality control system capable of perceiving defects in small watch parts, by taking pictures from various angles of light emitting diodes and analysing them. The setup is accompanied by a software toolbox, based on neural networks algorithms, capable of localizing and recognizing whether aesthetic defects are present or not.



(Semi-) Automated quality control. An operator can choose the option to visualize the images and make the decision of conformity (semi-automated), or let the system make the decision (automated).

Two setups were designed for watch parts: a LED hemisphere for metallic objects and a LED ring for glass. The main advantage of the EagleEye system lies in its unique ability to control each LED individually and to have many possible incident angles through which a sample is illuminated. The importance of the incidence angle is illustrated by the figure below depicting a coin with scratches. These defects have very different appearance, depending on the illumination elevation and orientation.



EagleEye hemisphere. The LEDs in this setup are at different elevations and azimuths, while the camera looks at the samples from the top.

The whole system, including the optimization and the classification algorithms, does not rely on a model of the object; there is no need of a priori information.

Added values of the EagleEye system

- Automated system
- Objective decision making
- Accurate, reproducible, repeatable
- Adaptive learning
- Fast, low cost
- Flexible
- Allows for a better usage of human resources

Two EagleEye patents were submitted.

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