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HEmispherical LIght Oriented Sensor

A different lighting for visual inspection

The HEmispherical LIght Oriented Sensor - HELIOS, unique to the market, helps to perform quantified visual inspections by non-skilled operators and avoids complex operations while increasing portability.

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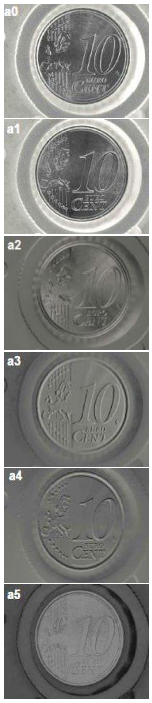
Challenge

Visual Inspection performed today exhibit limits in regards to their capacity to characterize indications. The idea of this innovation is to provide visual inspection with multi elements dimension that enables a better appreciation of the inspected surfaces compared to ultrasonic or magnetic inspections.

Solution

HELIOS drastically improves tele visual inspection (TV) by offering a tool for interpretation and analysis of images according to different illumination angles. Based on the surface reflectance evaluation, HELIOS generates a batch of images resulting from the analysis.



The generated batch of images is the key to the process as each image has its own physical component.
For example, a5 is a basic image that can be observed through a standard TV.
The a3 and a4 images only reveal the relief of the part in the X and Y directions, only displaying the real distortions of the part.
Images a0 and a1 manifest the differences of reflectance. The analyst is able to determine if an indication is in relief (porosity, depression) or on the surface without form defect (crack, coloration...).
About 100 LEDs can be used for the computation. This number can be adapted according to the treatment duration.

Technical information

TECHNICAL CHARACTERISTICS

- Sensitivity: about 1 pixel i.e.10µm (Standard version)
- Complete inspection time in SD Mode: 5s
- Analysis time in SD Mode: 5s
- 3D reconstruction time: 5s
- Design optimized for metallic surface inspection
- Sturdiness: tolerates loss of faulty LEDs

PHYSICAL CHARACTERISTICS

- Dome diameter: 50mm
- Dome weight: around 350g
- Power supply and lighting multiplexer box:
  - Dims: 100 x 50 x 50mm
  - Weight: 1kg

PC CONFIGURATION

- Touchpad tablet Microsoft Surface Pro

USER INTERFACE

- Intuitive MMI with LabVIEW support

DEVELOPMENT

- Integration of new image analysis algorithms (HSH, zernike,...)
- Optimization of the frame rate
- Remote work
- Underwater work
- Wireless ergonomics
- Defects categorization between:
  - Cracks
  - Cavities
  - Surface impurities
  - Geometrical defects

Customer benefits

- 2D Improved detection and 3D characterization
- No lasers, only white led
- Quick and simple

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is **our** everyday **commitment**

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