# AUTOMATIC VISUAL INSPECTION OF CERAMIC PLATES BASED ON SIFT AND SURF DESCRIPTORS

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Motivation:

The occurrence of defects in a manufacturing process is very frequent and almost impossible to avoid. So it is always necessary real time quality control. Currently, and in particular in the ceramic industry, this is mainly carried out by human visual inspection. However, it is highly advantageous to automate this process. This opinion is shared with enterprises as Matceramica despite the high degree of expertise of its operators.

Typical defects:
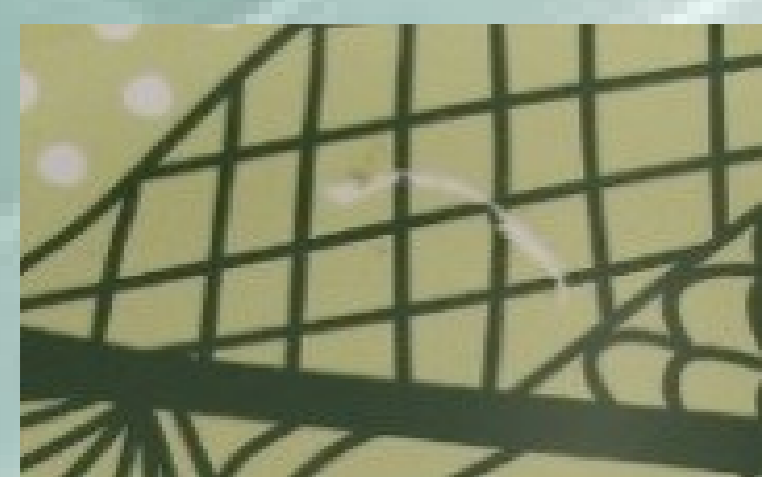
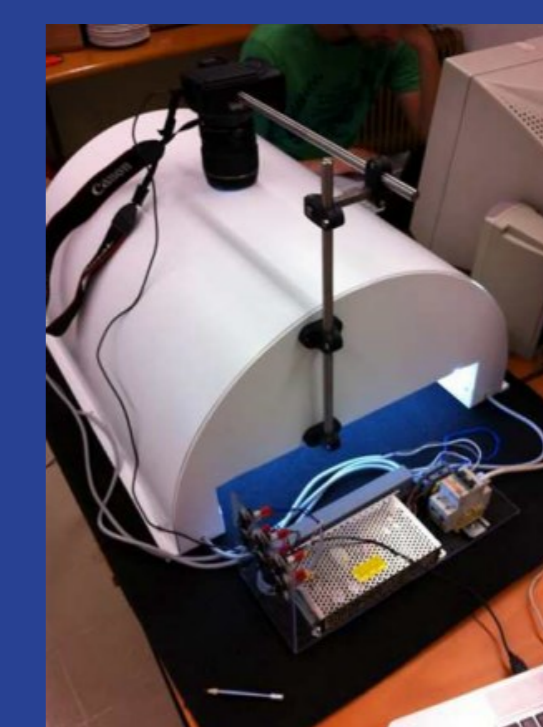A - spoiled ceramic decals
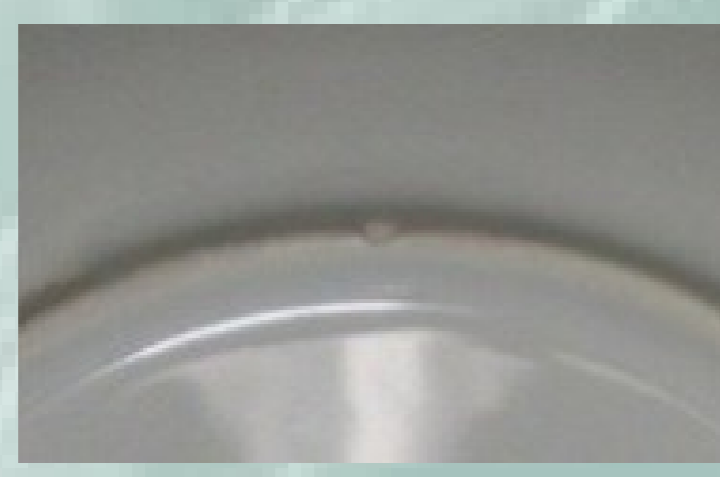
B - Missing glass

C - Granules

Description:

Image acquisition. Illumination

The illumination of quite reflective ceramic plates is very challenging. Inspired in commercial solutions a low cost dome was designed and quite satisfactory images were obtained.

Defects of type A

Algorithm steps: (1) Find the different regions of the image, namely, the black sheet, the white sheet and the remaining plate. (2) Find the interest points for each region based on the SIFT algorithm (3) The classification of these points as defect or no defect was carried out by a neural network.

Defects of type B

Algorithm steps: (1) Find the region of the interest (ROI) of the plates using the Hough transform (2) Find the points of interest and select those that are inside the interest region (3) Define a global descriptor for each plate characterized by a vector of m features (4) Train a neural network (feed forward with one hidden layer with 70 neurons).

Defects of type C

After image preprocessing it was verified that were found interested points using the SURF method inside the ROI, only in the case of existing defect.
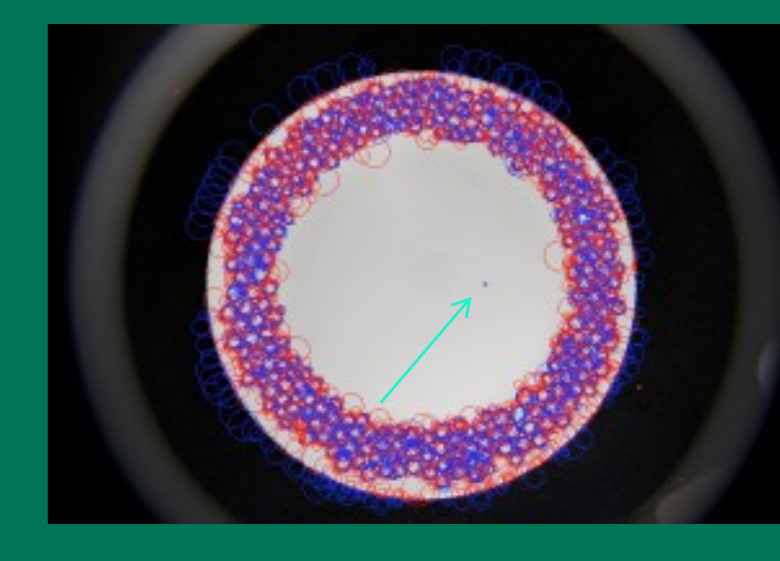
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Some results:

Acknowledgements :