

# SURFACE INSPECTION

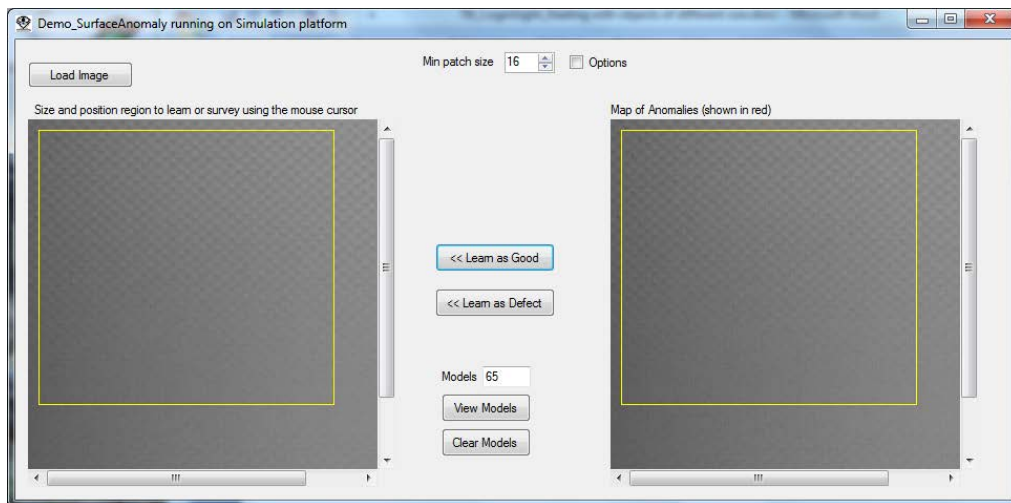
Texture learning is easy with the CogniSight engine. A region of interest can be divided into patches and the neurons will automatically learn the patches which are significant to describe the texture of the region.

In the example below, the surface inspected is solar glass which features a periodic bumpy pattern. Following is a series of patches of 16x16 pixels learned by the neurons. Assuming that a glass area with good quality is learned by taking examples of patches at all possible phase and assigning them the “Good” category, the content of the resulting committed neurons is a description of the good glass texture.

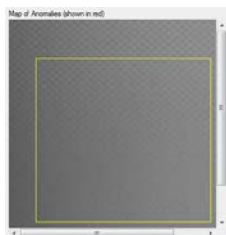


The user interface presented below is very simplistic but sufficient to illustrate how to develop a surface inspection system with the CogniSight technology. The area selected by the user and outlined in yellow has been learned as a “Good” texture and this has generated 65 models. The number of models depends on two settings of the learning operation: the value of the maximum influence field (MAXIF) of the neurons and the scanning step used to extract the sample patches from the region of interest.

- The higher the step and the smaller the number of samples.
- The smaller the MAXIF, the more models.

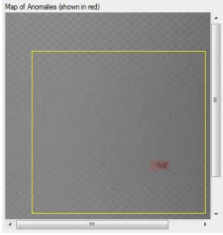


The image to the right is supposed to highlight the patches which are not recognized by the CogniSight engine because they do not match any of the 65 models. In this case, all learned patches are positively identified.



The same remark is true if the region of interest is moved around as shown in the image to the left.

This is made possible by learning the content of the region using a step of 1 or 2 which allows to generate representations of the patches of texture at many different phases:



If a new image is loaded and shows a significant defect, the neurons will not recognize the patches at the location of the defect. They appear highlighted in red in the Transform image.

In the event that a defect is not properly identified, a new region limited to patches covering the defect can be selected with the mouse cursor and learned as a Bad texture. This learning operation will have the effect to reduce the influence field of the neuron(s) recognizing the patches as good prior to learning them as counter examples.

### More information...

General Vision has developed a complete [Defect Detection System](#) installed and tested over a glass float. It is revolutionary solution based on a scalable chain of V1KU cameras programmed with a same CogniSight engine for surface inspection and loaded with the same knowledge in their respective CM1K chips.