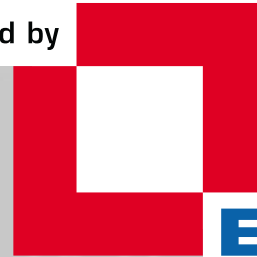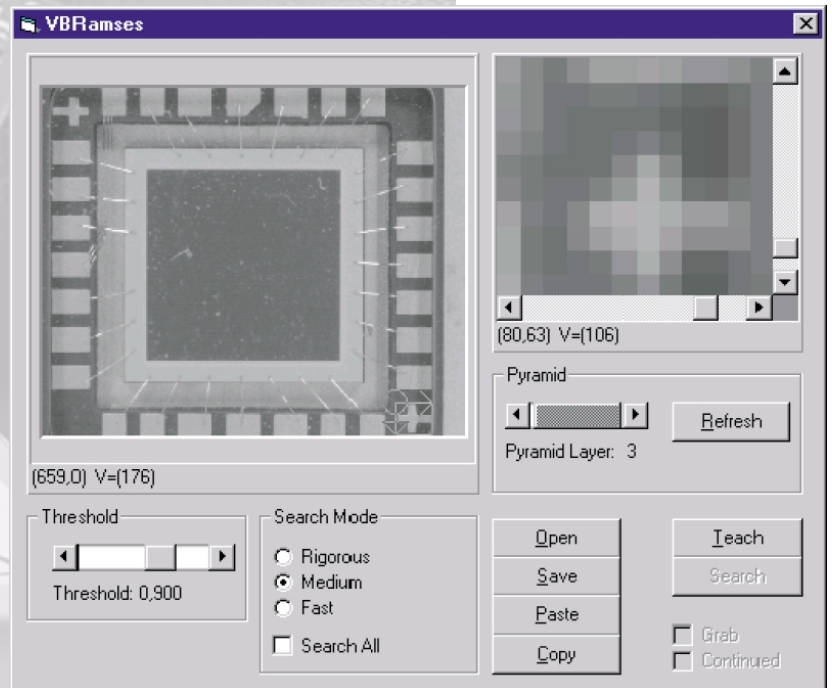# ▶ Ramses

**powered by**

COMMON VISION
**BLOX**

**Software tool
for detecting
large objects**

# ► Ramses

Ramses is a software tool which has been developed to detect large objects. It operates with the detection method of normalized gray scale correlation using image pyramids. In this classic correlation procedure the image data to be compared is moved over the search area, thus ascertaining the area with the maximum match. The larger the object (template) to be searched for, the longer it takes with this type of object search. Ramses is also able to detect large objects, e.g. 100 x 100 pixel templates, fast as a result of the pyramid method. The threshold values within the individual pyramid levels are calculated automatically by Ramses and classed as »fast«, »medium«, and »precise«. The tool works both in the pixel and in the subpixel range.

## ► Image pyramids

Many image processing algorithms can be accelerated with the aid of the pyramid method. To generate the individual pyramid levels, the image is zoomed from level to level by factor 2 using a special procedure. Ramses also uses an image pyramid for the template. This operation results in a data reduction per pyramid level of factor 4, thus accelerating calculation by factor 16 (factor 4, result of image data reduction, multiplied by factor 4, result of template data reduction). It is easy to see that large objects, in particular, can be found much faster with this approach.



Layer 4
Layer 3
Layer 2
Layer 1
Layer 0 (original image)
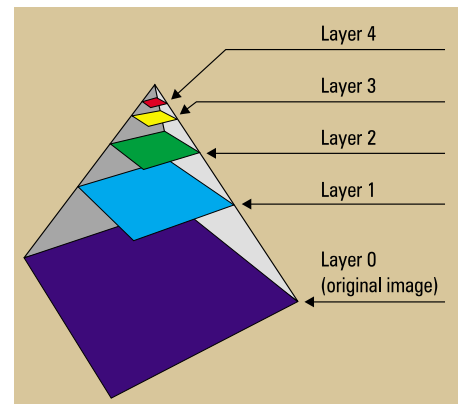
## ► Search speed

The following diagram shows the relationship between the search speed and the correlation threshold. (If the value is close to 1, a good match is achieved. No qualitative statement can be made with regard to a threshold that is below approximately 0.65.)



Searchtime vs Correlation Threshold
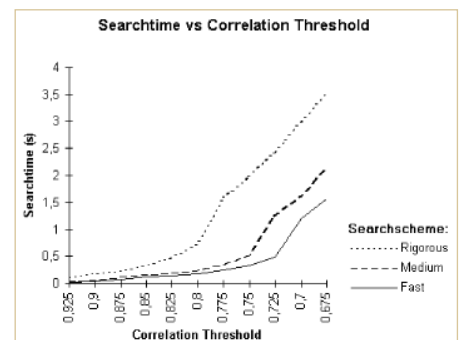
## ► Possible fields of use

- Completeness verification
- Print verification
- Position checking
- Orientation checking
- LED display checking