

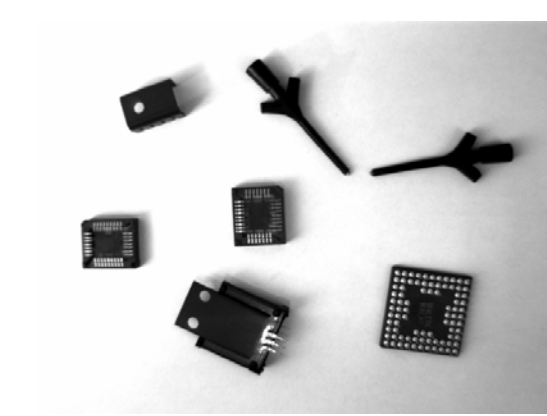


Sapera Essential Blob Tool Benchmarks

This is a report of the Dalsa Coreco Blob tool performance. The system used for the benchmark is a P4 2.2 GHz with 512 MB of memory (DDR 333) and running the Windows 2000 operating system.

The Images and Parameters

The benchmarks are made on the image shown in the table below. This image is available in the Sapera Essential package.

Reference Image	
	<p>Name: components.bmp</p> <p>Type: Gray scale – 8bit</p> <p>Size: 640x480 pixels</p>

The Tests

Test 1: Basic features calculation

The reference image is thresholded. Blobs are extracted from the binarized image. All basic blob features are calculated and blobs which area is smaller than 100 pixels are removed. The basic features calculation include area, bounding box location and size, centroid, raw perimeter length, number of holes, form factor (ratio of area to the square of perimeter), elongation.

Test 2: Moments related features calculation

All the steps corresponding to Test 1, and then, calculation of moments related blob features. The moments features calculation include all basic features as well as best-fitting ellipse, ratio of best-fitting ellipse axes, orientation, roundness.

Test 3: Perimeter related features calculation

All the steps corresponding to Test 2, and then, perimeter related blob features are calculated. The perimeter features calculation includes all moments features as well as perimeter points co-ordinates (blob's boundary and holes), filled area.

Test 4: Convexity related features calculation

All the steps corresponding to Test 1, and then, convexity related blob features are calculated, with the number of Feret angles set to 30. The convexity features calculation include all basic features as well as convex area, minimum bounding box location, size and orientation, minimum, mean, maximum Feret diameters and corresponding angles, convexity (ratio of convex perimeter to raw perimeter), solidity (ratio of net area to convex area).

Test 5: Gray scale features calculation

All the steps corresponding to Test 1, and then, gray scale blob features are calculated. The gray scale features calculation include all basic features as well as minimum, maximum, standard deviation of all pixels of the blob, gray scale centroid.

The Results

The table below shows the results of all the tests.

Test #	Description	Blobs found (dark blobs on light background)	Execution time	
			Global fixed threshold	Global adaptive threshold
1	Image thresholding and Basic features calculation	7 (13% of image area)	1.12 ms	1.23 ms
2	Image thresholding and Moments features calculation	7 (13% of image area)	1.13 ms	1.25 ms
3	Image thresholding and Basic features calculation	7 (13% of image area)	3.19 ms	3.30 ms
4	Image thresholding and Convexity features calculation	7 (13% of image area)	3.78 ms	3.89 ms
5	Image thresholding and Gray scale features calculation	7 (13% of image area)	1.93 ms	2.05 ms

Note

The default parameters were used for the image thresholding.



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