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Geometric Statistics

The Geometric Statistics module adds a couple of image statistic variables centered around image geometry. These variables can then be used in RoboRealm [conditional statement](#), [VBScript module](#) or exported to external programs using [RoboRealm Plugins](#).

Interface

Name	Value
AREA	10386
PERIMETER	611
EQUIV_DIAMETER	114.9951
AP_RATIO	16.9984
COMPACTNESS	35.9447
COMPACTNESS_2	0.7173
CIRCULARITY	0.3497
CIRCULARITY_2	0.7529
CIRCULARITY_3	0.4375
MAX_RADIUS	96
MIN_RADIUS	42
FERET	160.3278
FERET_AREA	20361.6290
FERET_ORIENTATION	13.3429
FERET_FIRST_X	56
FERET_FIRST_Y	128
FERET_SECOND_X	212
FERET_SECOND_Y	165
BREATH	127.0001
ROUNDNENESS	0.5145

1. Scope - Click on the appropriate radio button to select if you want the statistics to be generated from the entire image or from an individual blob. If you select individual blobs non-black pixels in the current image will be used to form blobs. To see the statistics for an individual blob click on the blob within the main RoboRealm GUI window. That will switch the variable(x) denotation to that particular blob.

Variables

AREA - the number of non-black (0,0,0) pixels in the current image

ANGLE - the orientation angle of the blob. This is calculated by determining the angle from the center of gravity of the blob to the furthest point from that center along the blob's perimeter.

ANGLE_ALT - alternative orientation angle of the blob. This is calculated by determining the vector formed by the center of gravity to the perimeter's center of gravity. If your blob has holes in it this may be a more stable way to determine blob orientation than ANGLE.

ANGLE_ALT_2 - alternative orientation angle of the blob. This is calculated by determining the average vector formed from a current perimeter point to the center

of gravity.

COG_X, COG_Y - the center of gravity of the blob

PERIMETER - the number of pixels that surround non black blobs

AP_RATIO - AREA / PERIMETER, determines how round an image is; also known as "Perimeter Equivalent Diameter".

EQUIV_DIAMETER - the diameter of a circle with the same area as the region. Calculated as $\sqrt{4 * \text{Area} / \pi}$

COMPACTNESS - $(\text{PERIMETER} * \text{PERIMETER}) / \text{AREA}$: ratio of the square of the perimeter to the area; also known as "shape".

COMPACTNESS_2 - $\sqrt{4 * \text{AREA} / \pi} / \text{FERET}$: alternate compactness measure

CIRCULARITY - $4 * \pi * \text{AREA} / (\text{PERIMETER} * \text{PERIMETER})$, measure of circularity.

CIRCULARITY_2 - alternate measure of circularity.

CIRCULARITY_3 - MIN_RADIUS/MAX_RADIUS : another alternate measure of circularity.

MAX_RADIUS - radius of enclosing circle around center of gravity

MIN_RADIUS - radius of enclosed circle around center of gravity

FERET - Feret's diameter also known as the caliper length or largest axis length: the greatest distance between any two non-zero pixels

FERET_AREA - FERET * BREATH; also know as Feret's bounding box

FERET_ORIENTATION - orientation of the Feret's diameter in degrees

FERET_FIRST_X

FERET_FIRST_Y

FERET_SECOND_X

FERET_SECOND_Y - points that makeup the Feret diameter

BREATH - the largest axis perpendicular to the Feret diameter

ROUNDNESS - $4 * \text{AREA} / (\pi * (\text{FERET} * \text{FERET}))$, measure of roundness

MIN_X - minimum bounding box x coordinate

MIN_Y - minimum bounding box y coordinate

MAX_X - maximum bounding box x coordinate

MAX_Y - maximum bounding box y coordinate

EXTENT - proportion of the pixels in the bounding box that are also in the region. Calculated as (blob area / bounding box area).

TOP_LEFT_X

TOP_LEFT_Y

TOP_RIGHT_X

TOP_RIGHT_Y

RIGHT_TOP_X

RIGHT_TOP_Y

RIGHT_BOTTOM_X

RIGHT_BOTTOM_Y

BOTTOM_LEFT_X

BOTTOM_LEFT_Y

BOTTOM_RIGHT_X

BOTTOM_RIGHT_Y

LEFT_TOP_X

LEFT_TOP_Y

LEFT_BOTTOM_X

LEFT_BOTTOM_Y - the extrema points of the image

FERET_ASPECT_RATIO - FERET/BREATH

BOX_ASPECT_RATIO - (MAX_X-MIN_X)/(MAX_Y-MIN_Y)

WIDTH - the width of the object in pixels

HEIGHT - the height of the object in pixels

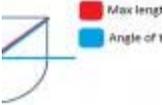
Note that you can highlight the appropriate statistics and press CTRL-C to copy the information to your clipboard. This information can then be pasted into Excel or other statistics programs.

See Also

[Center of Gravity](#)

[Moments of Inertia](#)

[Color Statistics](#)

Geometric_Statistics Related Forum Posts		Last post	Posts	Views
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		Geometric Statistics Problem	2 years	3	898
Hi Steven and Prof Mason, Thanks for ur help in my last post about marker p...					
		Image Module Problem	2 years	9	1521
Hello Steven, [image1] [image2] I'm trying to align/regi...					
		SRV- 1B	2 years	2	733
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		triangle direction	2 years	5	1180
hi! how can i find a triangle direction using RR? ...					
overflow					
I am calculating an angle from result obtained from earlier calculation. The result return an error with OVERFLOW.			2 years	2	751