

LEARN OPENCV BY EXAMPLES

OpenCV simplified for beginners by the use of examples. Learn OpenCV with basic implementation of different algorithms.

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Threshold operation

double **threshold**(InputArray src, OutputArray dst, double thresh, double maxval, int type)

Applies a fixed-level threshold to each array element

Parameters:

- **src** – input array (single-channel, 8-bit or 32-bit floating point).
- **dst** – output array of the same size and type as **src**.
- **thresh** – threshold value.
- **maxval** – maximum value to use with the THRESH_BINARY and THRESH_BINARY_INV thresholding types.
- **type** – thresholding type

- **THRESH_BINARY**

$$\text{dst}(x, y) = \begin{cases} \text{maxval} & \text{if } \text{src}(x, y) > \text{thresh} \\ 0 & \text{otherwise} \end{cases}$$

- **THRESH_BINARY_INV**

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$$\text{dst}(x, y) = \begin{cases} 0 & \text{if } \text{src}(x, y) > \text{thresh} \\ \text{maxval} & \text{otherwise} \end{cases}$$

- **THRESH_TRUNC**

$$\text{dst}(x, y) = \begin{cases} \text{threshold} & \text{if } \text{src}(x, y) > \text{thresh} \\ \text{src}(x, y) & \text{otherwise} \end{cases}$$

- **THRESH_TOZERO**

$$\text{dst}(x, y) = \begin{cases} \text{src}(x, y) & \text{if } \text{src}(x, y) > \text{thresh} \\ 0 & \text{otherwise} \end{cases}$$

- **THRESH_TOZERO_INV**

$$\text{dst}(x, y) = \begin{cases} 0 & \text{if } \text{src}(x, y) > \text{thresh} \\ \text{src}(x, y) & \text{otherwise} \end{cases}$$

Find an example in [OpenCV documentaion](#).

Steps:

1. Load an image
2. Create a window to display results
3. Create Trackbar to choose type of Threshold
4. Call the function "Threshold_Demo" to perform threshold operation.

Functions:

[threshold](#), [createTrackbar](#), [imread](#), [cvtColor](#), [namedWindow](#), [waitKey](#).

Example:

```

1  #include "opencv2/imgproc/imgproc.hpp"
2  #include "opencv2/highgui/highgui.hpp"
3  #include <stdlib.h>
4  #include <stdio.h>
5
6  using namespace cv;
7

```

- 7 Kalman Filter Implementation (Tracking mouse position)
- 8 Histogram Calculation
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- 10 Hough Circle Detection

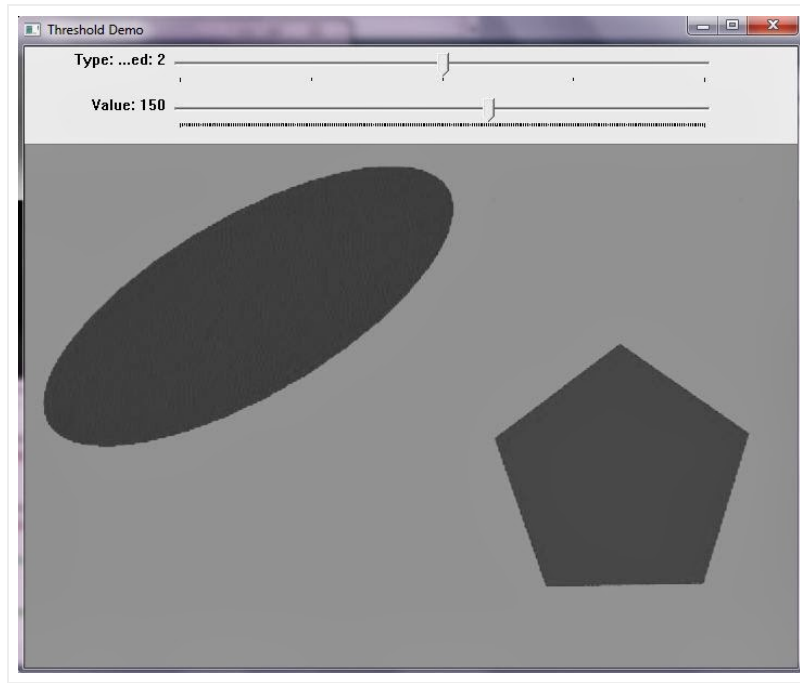
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```
8   int threshold_value = 0;
9   int threshold_type = 3;;
10  int const max_value = 255;
11  int const max_type = 4;
12  int const max_BINARY_value = 255;
13
14  Mat src, src_gray, dst;
15  char* window_name = "Threshold Demo";
16
17  char* trackbar_type = "Type: \n 0: Binary \n 1: Binary Inverted \n
18  char* trackbar_value = "Value";
19
20  void Threshold_Demo( int, void* );
21
22  int main( int argc, char** argv )
23  {
24      /// Load an image
25      src = imread( "shape.jpg", 1 );
26
27      /// Convert the image to Gray
28      cvtColor( src, src_gray, CV_RGB2GRAY );
29
30      /// Create a window to display results
31      namedWindow( window_name, CV_WINDOW_AUTOSIZE );
32
33      /// Create Trackbar to choose type of Threshold
34      createTrackbar( trackbar_type,
35                    window_name, &threshold_type,
36                    max_type, Threshold_Demo );
37
38      createTrackbar( trackbar_value,
39                    window_name, &threshold_value,
40                    max_value, Threshold_Demo );
41
42      /// Call the function to initialize
43      Threshold_Demo( 0, 0 );
44
45      /// Wait until user finishes program
46      while(true)
47      {
48          int c;
49          c = waitKey( 20 );
50          if( (char)c == 27 )
51              { break; }
52      }
53  }
54
55
56  void Threshold_Demo( int, void* )
57  {
58      /* 0: Binary
59         1: Binary Inverted
60         2: Threshold Truncated
```

```
61         3: Threshold to Zero
62         4: Threshold to Zero Inverted
63     */
64
65     threshold( src_gray, dst, threshold_value, max_BINARY_value, thres
66
67     imshow( window_name, dst );
68 }
```

Result:



Sources:

<http://docs.opencv.org/doc/tutorials/imgproc/threshold/threshold.html>

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2 comments: