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**Section: ML**

**Q – Program to rotate image according to user using C++.**

#include "opencv2/highgui/highgui.hpp"

#include "opencv2/imgproc/imgproc.hpp"

using *namespace* cv;

*int* iAngle = 180;

*int* iScale = 50;

*int* iBorderMode = 0;

Mat imgOriginal ;

*int* iImageCenterY = 0;

*int* iImageCenterX = 0;

const *char*\* pzRotatedImage = "Rotated Image";

*void* CallbackForTrackBar(*int*, *void*\*)

{

 Mat matRotation = getRotationMatrix2D(  Point( iImageCenterX, iImageCenterY ), (iAngle - 180), iScale / 50.0 );

 // Rotate the image

 Mat imgRotated;

 warpAffine( imgOriginal, imgRotated, matRotation, imgOriginal.size(), INTER\_LINEAR, iBorderMode, Scalar() );

 imshow( pzRotatedImage, imgRotated );

}

*int* main( *int* *argc*, *char*\*\* *argv* )

 {

 // Load the image

 imgOriginal = imread( "MyPic.JPG", 1 );

 iImageCenterY = imgOriginal.rows / 2;

 iImageCenterX = imgOriginal.cols / 2;

 //show the original image

 const *char*\* pzOriginalImage = "Original Image";

 namedWindow( pzOriginalImage, CV\_WINDOW\_AUTOSIZE );

 imshow( pzOriginalImage, imgOriginal );

 //create the "Rotated Image" window and 3 trackbars in it

 namedWindow( pzRotatedImage, CV\_WINDOW\_AUTOSIZE );

 createTrackbar("Angle", pzRotatedImage, &iAngle, 360, CallbackForTrackBar);

 createTrackbar("Scale", pzRotatedImage, &iScale, 100, CallbackForTrackBar);

 createTrackbar("Border Mode", pzRotatedImage, &iBorderMode, 5, CallbackForTrackBar);

*int* iDummy = 0;

 CallbackForTrackBar(iDummy, &iDummy);

 waitKey(0);

 return 0;

 }