

## CROPPING IMAGE IN RECTANGULAR, CIRCULAR, SQUARE AND TRIANGULAR FORM USING MATLAB

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**Abstract:** Image Processing is technique by which we can process any image to extract the real information i.e. useful information from the image. Sometimes we require some specific part of the image to process and for it we have to select that portion only. This technique of selecting useful portion is called cropping.

### 1. INTRODUCTION

An image may be defined as a two dimensional function  $f(x, y)$ , where  $x$  and  $y$  are spatial coordinates and the amplitude of  $f$  at any pair of coordinates  $(x, y)$  is called the intensity or gray level of the image at that point. Image processing is type of signal processing in which we have image as a input and we process it by applying some operations on the selected pixels to get some useful information out of it. In image processing we can improve the image to appear it better i.e. in context of our information extraction from given image. Image processing is of many types like digital image processing, optical image processing and analog signal processing.

In image processing technique we consider any image as multi dimensional matrices depending on the format of the image. The task that can be performed by image processing is color correction, compression decompression of the image, image recognition and image cropping.

Two broad categories in image processing includes the modification in quality of picture like color, sharpness etc. and other is resizing like cropping. In first type of processing we need to modify the amplitude level and in the second category type processing we select or reject some pixels value which are not desired. Cropping an image means creating a new image from a part of an original image. It is real important task as it may be needed to extract some specific part of an image or to change aspect ratio of an image, as aspect ratio is major concern in film making. It is generally used to remove the unwanted or irrelevant detail from the photo.

### 2. CROPPING SHAPES

We generally use rectangular cropping due to ease of its implementation. But what if we have to remove red eye and eye use to be circularly crop, and in another example if we have to use face recognition and we have to scan only retina of the eye which is also in circular form so circular crop is equally important as well. So that the triangular and square cropping. Different shapes in which we can crop the image is given as

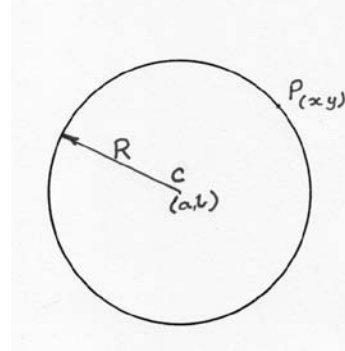
**A. Rectangular Crop:** it is easiest to crop image in rectangular form because we have to just select two coordinates on the image and using MATLAB we decide other two coordinates and the image is cropped in rectangular format.

**B. Circular crop:** In this type of cropping we select center of the circular form in which we have to crop the image, then we select other point on the image to decide the cropped image radius. In implementation of circular crop we use locus of the circle to crop the image in circular form. It is the most useful shape to crop any image in this form.

The locus use for cropping image in circular form is given by

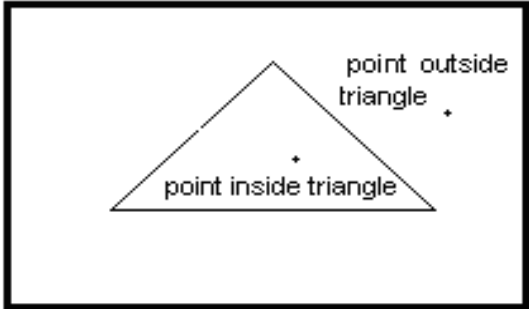
$$(x - a)^2 + (y - b)^2 = R^2$$

Where  $h$  and  $k$  are the  $x$ - and  $y$ -coordinates of the center of the circle and  $r$  is the radius.



**C. Square Crop:** To crop any image in square form we have to define two points on the image for corner points and then we define points by this coordinate such that  $x=y=d$ , where  $d$  is some constant.

**D. Triangular Crop:** Because triangular shape doesn't have regular locus point, we have to use some other technique to crop image in triangular form. For cropping image in triangular form we check pixels of the image, in which side of the lines of the triangle, does the pixel lie, and if it lies inside the triangle we select it otherwise we reject it.



Cropped image in exact Circular shape.



Original Image



Cropped image in Square shape.



Cropped image in rectangular shape



Cropped image in Triangular Shape

### 3. CONCLUSION:

Cropping in different shape is quite important, for e.g in case of red eye detection and in another example if we use face recognition system then it should automatically select the desired portion of the face to recognize it like retina of the eye. We can use image processing by MATLAB to crop any image in any shape.

### 4. REFERENCES

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