Measure the Diameter of an Object in an Image

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1 Problem Statement

Given an image of a single circular object, we need to apply segmentation on the image to identify the object and calculate its diameter.

2 Plan of Action

The task involves segmentation of the image to identify the object and then calculating its diameter. To segment the image we can use the following approach:

We can first convert the image to grayscale. This image may contain noise so we can apply smoothing using Gaussian filter. Now in order to detect the object in the image we can use an edge detector. In our case we can use Canny edge detector on the grayscale image. We can also try other edge detectors to see if they give better results. We can then apply dilation + erosion operation to fill the gaps between the edges in the edge map. Thus we obtain a segmented image.

Now we need to find the diameter of the object. For that we can first find the contour (i.e. outline) of the object in our image. We may get more than one contours because of noise in the image so we can discard any contour whose area is less than a given threshold value. Since there is a single circular object in the image we find the contour of the largest area. If the contour area is large enough then we can try to fit a minimum area rectangle around the contour. Since the object is a circle, the side length of this rectangle will give us the diameter of the object.

We will use Python with OpenCV to implement our approach.

3 References

Measuring size of objects in an image with OpenCV