

medical image segmentation with cv2

Asked 6 years, 7 months agoModified 6 years, 7 months agoViewed 4k times

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I am using the MIAS data set of breast cancer mammography pictures. The data is available here: <http://pejpa.essex.ac.uk/pix/mias/>

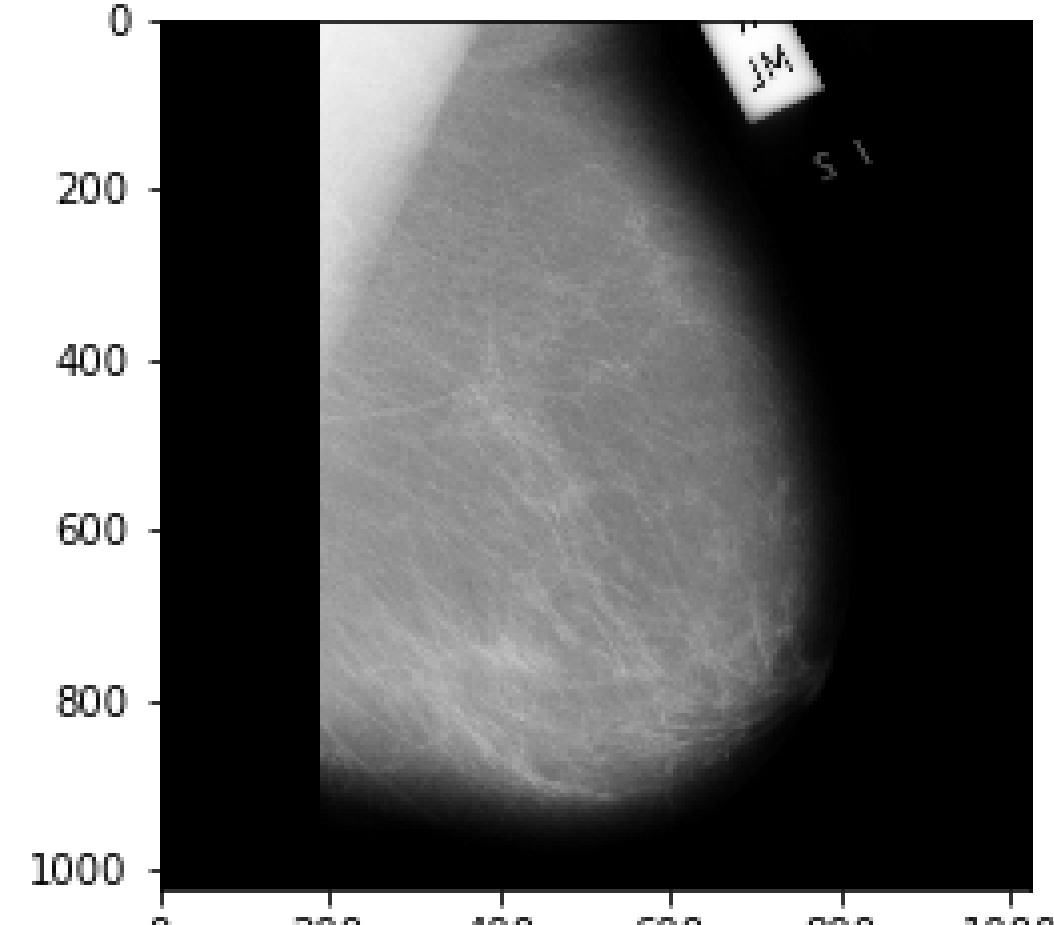
for example, an image looks like this:

```
import cv2
import numpy as np

img = cv2.imread("mdb168.pgm",0)

import matplotlib.pyplot as plt

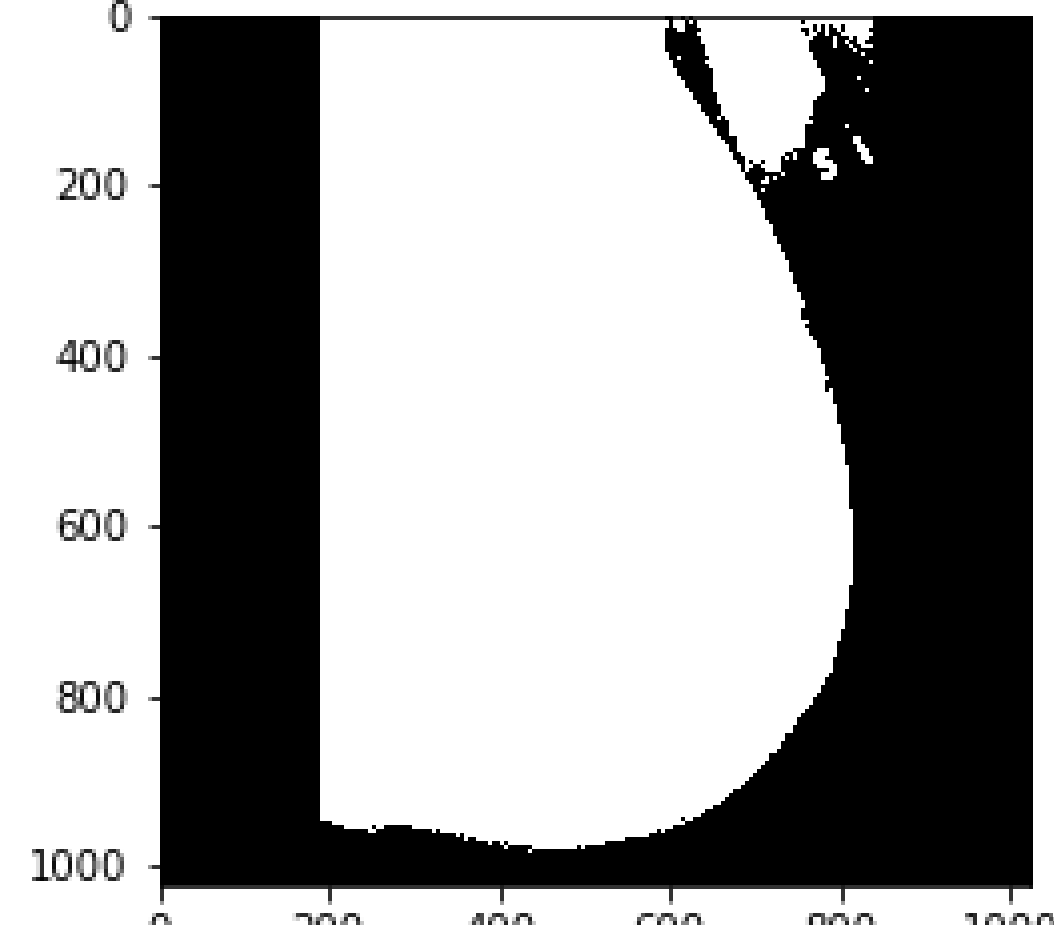
plt.imshow(img, cmap="gray")
```



I want to remove all artifacts and unnecessary parts of the image.

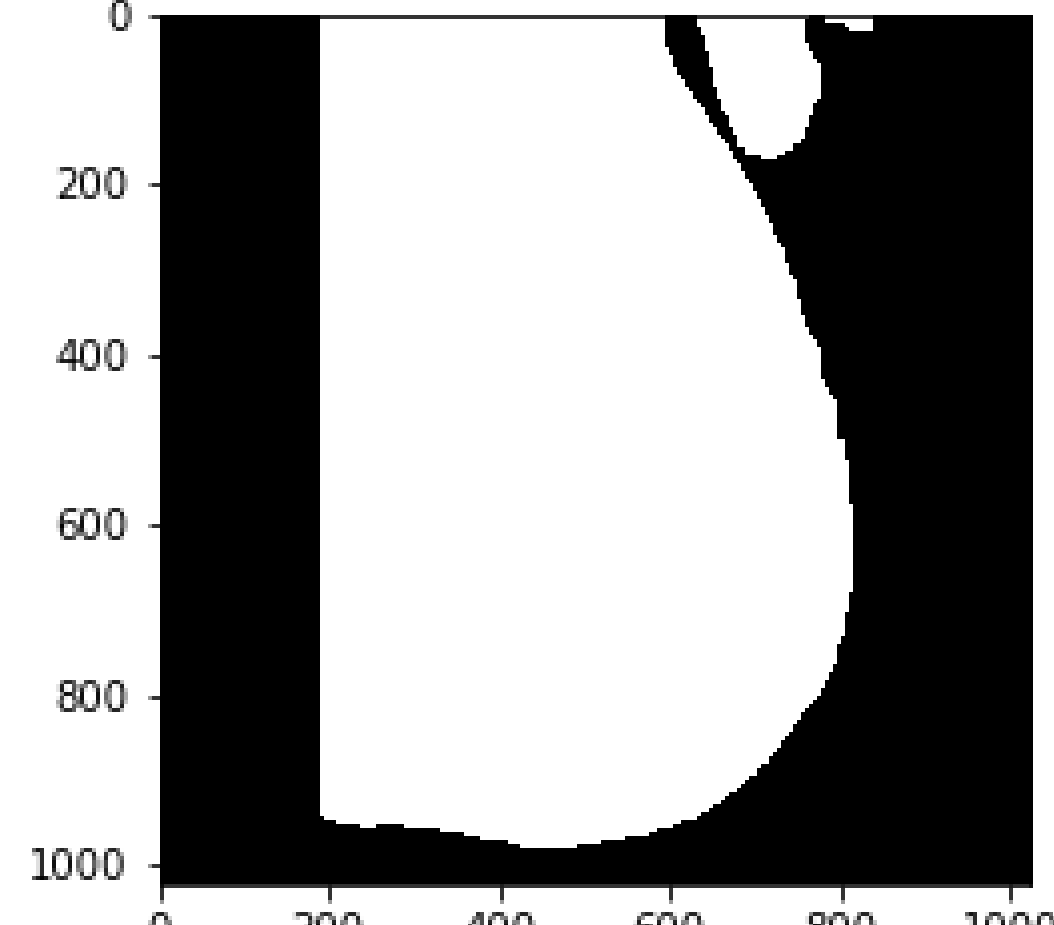
To do this,I first binarize the image

```
ret,thresh1 = cv2.threshold(img,0,255,cv2.THRESH_BINARY)
plt.imshow(thresh1, cmap="gray")
```



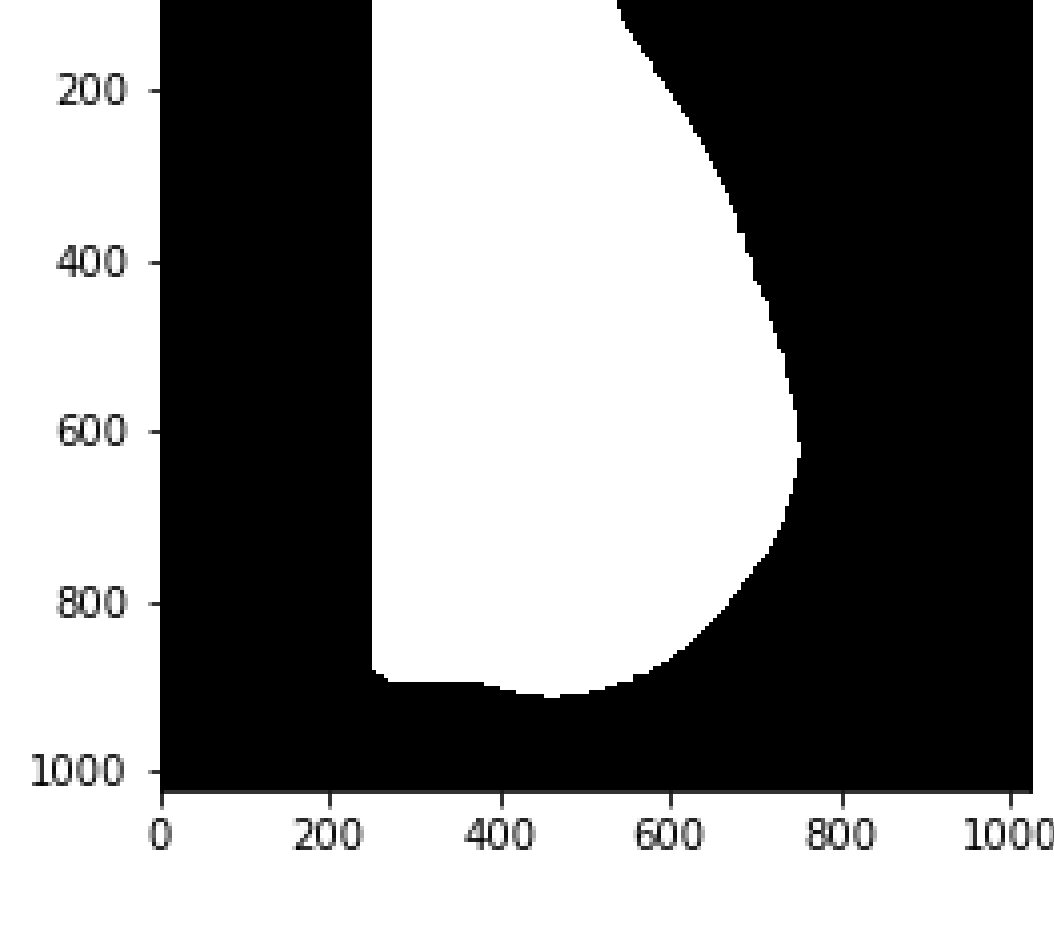
use opening

```
kernel = np.ones((20,20),np.uint8)
opening = cv2.morphologyEx(thresh1, cv2.MORPH_OPEN, kernel)
plt.imshow(opening, cmap="gray")
```



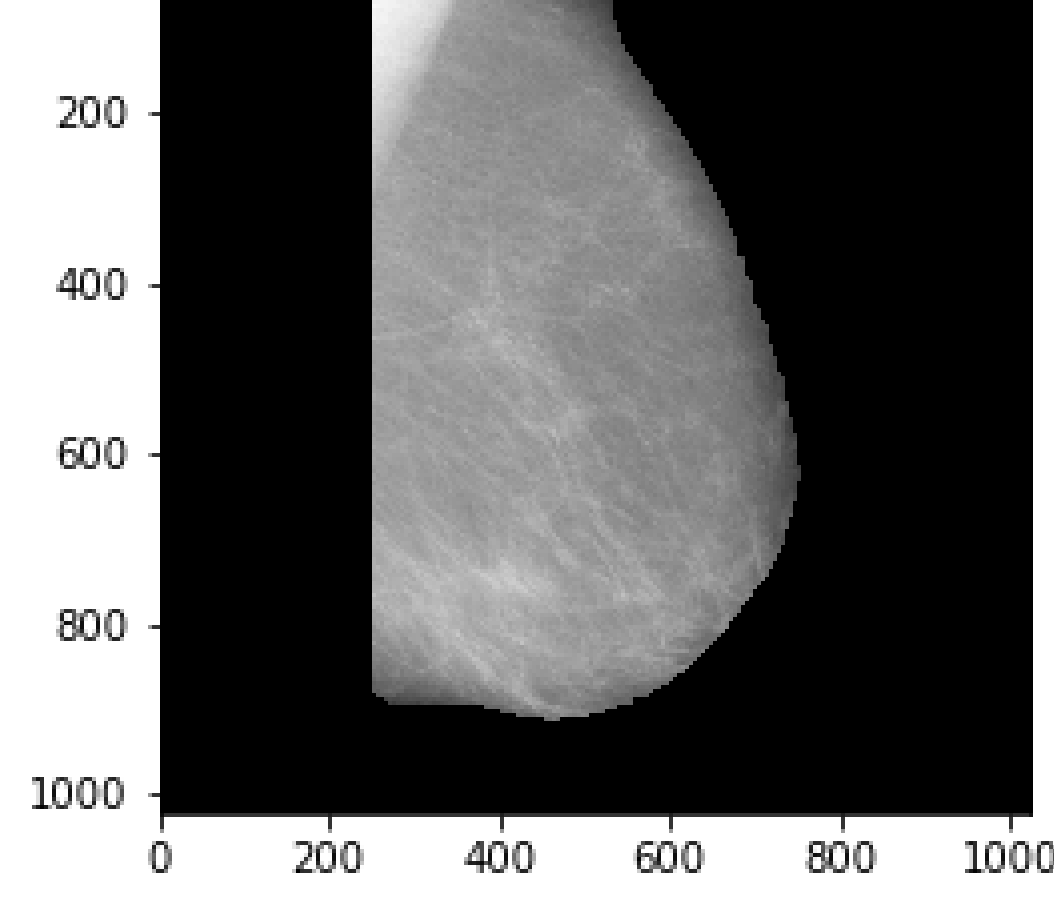
then erosion

```
kernel = np.ones((120,120),np.uint8)
erosion = cv2.erode(opening,kernel,iterations = 1)
plt.imshow(erosion, cmap="gray")
```



then merge this mask with the original image

```
merged = cv2.bitwise_and(img, img , mask=erosion)
plt.imshow(merged, cmap="gray")
```



I am now trying to remove the pectoral muscle in the upper left area. In this publication: <https://www.ncbi.nlm.nih.gov/pubmed/26742491> they use the exact same data set and do this with 'seeded region growing'. However, there is no code provided and I could not find this in opencv.

I could achieve a similar result by doing dilate/erosion etc again, but I'm looking for a more generalizable solution. Also, some of these images do not show a muscle and this should be detected as well.

pythonimageopencvimage-processing

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asked Feb 17, 2017 at 12:11
spore234
3,570 ● 6 ● 50 ● 77

Unfortunately, there is no region growing algorithm in opencv but you can build one. Just initialize a seed point, upper and lower threshold and should work by iterating over the image. [This](#) – Rick M. Feb 17, 2017 at 13:07

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I would use the following approach:

- (optional) I would replace the opening and the erosion with an opening by reconstruction \Leftarrow erosion followed by a geodesic dilation. It will preserve the original shape, and then you will keep a bigger ROI.
- Convolution filter (gaussian or simple average) to smooth the image
- Big white top-hat in order to detect the bright zone.
- Then you subtract the top-hat result to the original image.

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answered Feb 17, 2017 at 18:39
FiReTiTi
5,637 ● 12 ● 30 ● 58

do you have an example for the top hat method? I read docs.opencv.org/3.0-beta/doc/py_tutorials/py_imgproc/... but I do not understand how this works – spore234 Feb 17, 2017 at 21:47

Here it is: en.wikipedia.org/wiki/Top-hat_transform In your example, it's simply Image-Opening(Image), and here is an illustration <aishack.in/static/img/tut/morphology-tophat.jpg> – FiReTiTi Feb 17, 2017 at 22:32

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