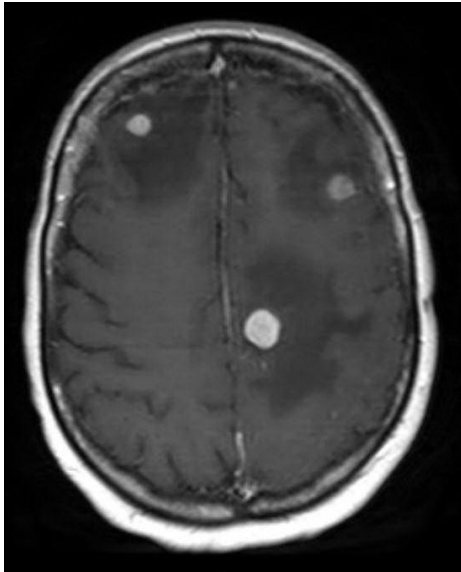


Artificial Vision Project Report

Christos Giannakas TP4901

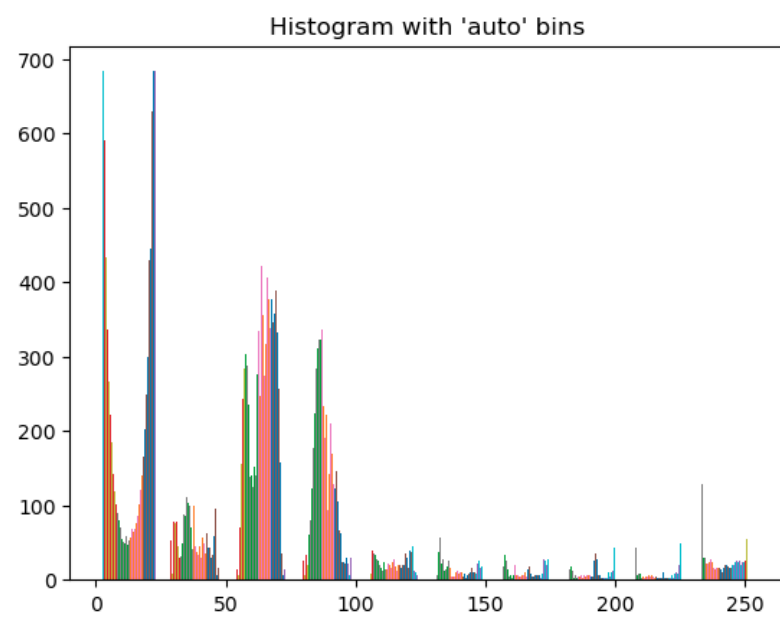
Computer vision techniques are used to analyse the images and identify regions that may be indicative of a tumour. Once the brain region is isolated, various image processing techniques can be applied to analyse the tissue and identify any potential tumours.

Brain tumours Image



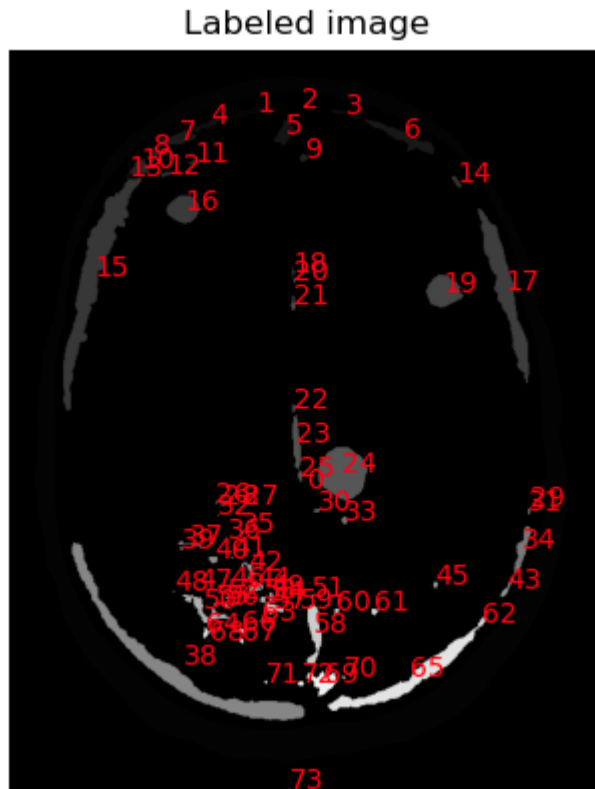
After we read the image we convert it to grayscale and then we use thresholding to get the Binary image. From the two methods I choose the manual thresholding over otsu method because I get a clearer binary image and also I can see the cancerous regions more clearly.

Histogram of the Image

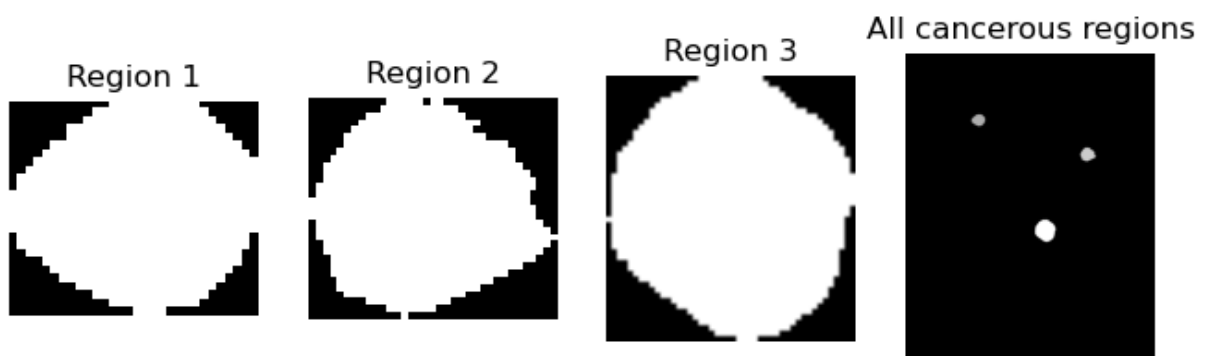


From the Histogram we can determine the appropriate threshold value to use. Is between 50 - 100, with this thresholding we can separate the interest objects easier. The image contrast is way better on the first half side.

Then we use the manual Binary image to label the interest areas.



We can see the cancerous regions have the numbers 16, 19 and 24.

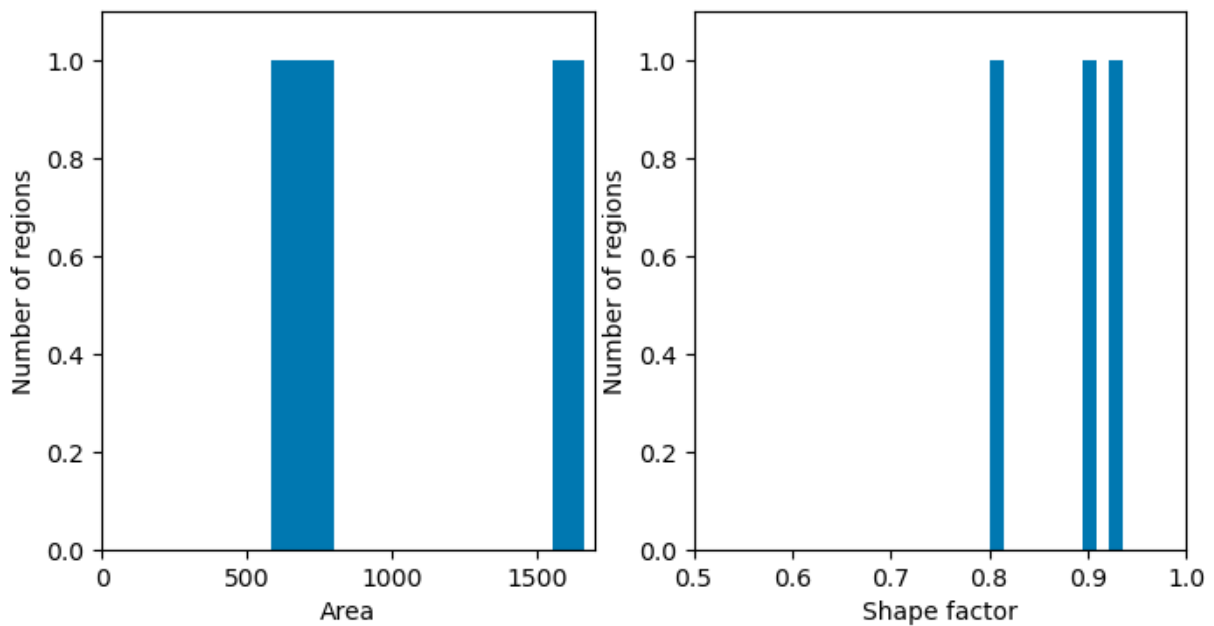


We select these regions and present them all in a Black image.

Then we compute the area and the shape of each region

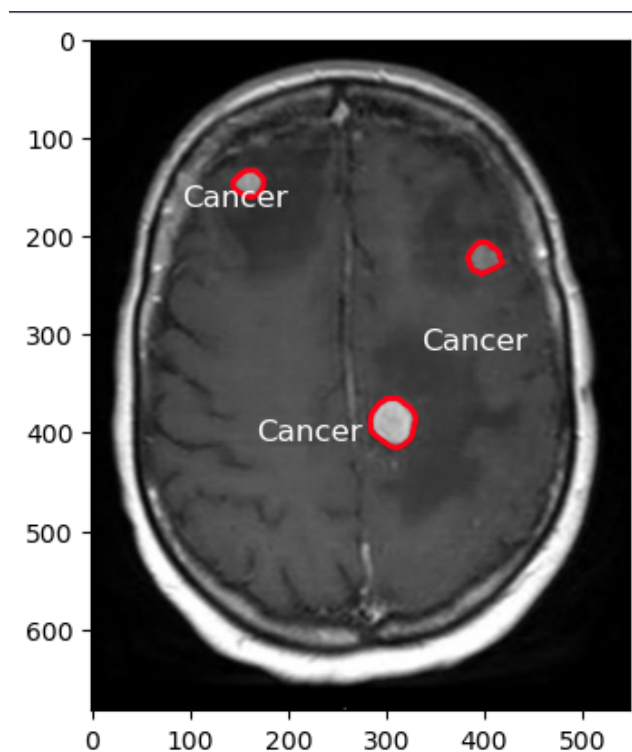
```
Region 1: area = 585  
Region 2: area = 725  
Region 3: area = 1663
```

The histogram from of the area and the shape we get

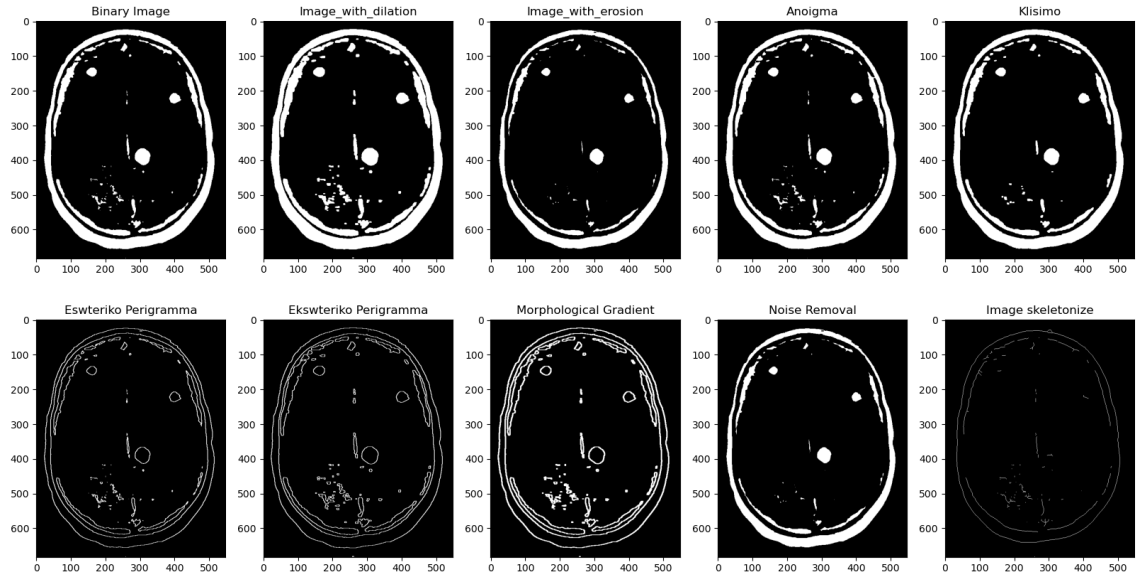


Based on the area and shape factor histograms of the regions, it appears that the three volumes are distinguished from the other regions. The tumours have larger surfaces and a different shape compared to the other areas. So it is possible to isolate tumours from the rest of the regions using these properties.

Use the same method to contour the image cancerous regions



Last Morphologically edit the edit the cancerous image.
I used Rectangle mask



Inner and outer contours in the cancerous image can provide valuable information about the shape, size, and structure of a tumour. The outer contour can be used to determine the overall size and shape of the tumour, while the inner contours can provide information about the internal structure of the tumour.