

AIM: To count the number of cells in the SPECULAR CORNEAL MICROSCOPY Image.

Algorithm:

- 1) Read the image and convert into grayscale.
- 2) Remove any small white noises using morphological opening.
- 3) Remove black in white and white in black using erode and dilate methods.
- 4) Create a blob detector which specifically monitors white and convexity while maintaining a minimum area of 7 pixels to remove overlapping.
- 5) Extract the keypoint from the blobs
- 6) Mark the centre of the blobs and get the approx area of the blobs.
- 7) Show all the processed video.

Output Images:

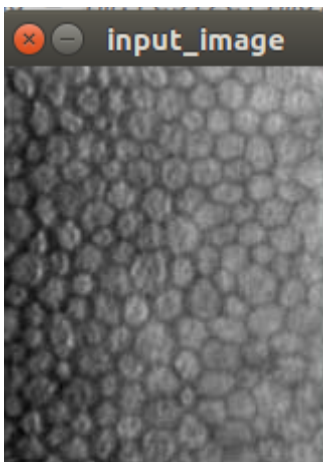


Illustration 1: input image

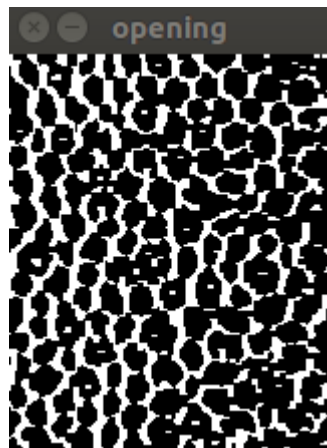


Illustration 2: opening image



Illustration 3: edges

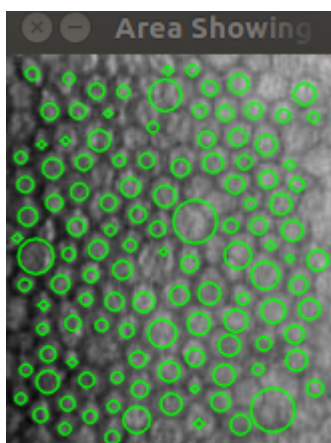


Illustration 4: showing approx areas of hexagons

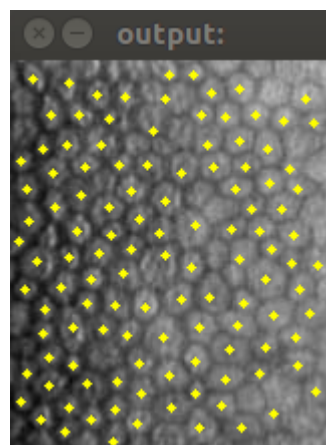


Illustration 5: final output image

input image resolution: 198 X 164
no. of cells : 118
minimum area: 3.14159265359 pixels
maximum area: 314.159265359 pixels

Result:

Through the affective detected blobs we could find most number of hexagons. The blobs are detected not by hexagon search but by relative inertia and convexity of the blobs which keeps in account all the possible distortions of the blob from the ideal hexagon structure.

Further Improvements:

The convexity and inertia parameter could be continuously changed to get all the percentage of hexagon each blob represents.

One approach could be training the machine to identifying a hexagon in which the positive image in the training could be one of the cropped hexagons of many in the picture. So basically traing to find a cell, as of the cells in all the pictures, in any picture containg the cells.