Assignment -1

Geospatial Vision / Visualisation

CS – 513

Smear detection on Camera Lens

Submitted By:

Niket Patel (A20384264)

Divyank Jain (A20384155)

Milind Mistry(A20377733)

Objective

- To find out which camera pic has smear, is an indispensable task in digital image processing.
- Lets say if the pic is being taken for street view then it will be difficult to again clean the camera lens or retake the picture.
- Hence it is necessary to detect the smear.

Approach

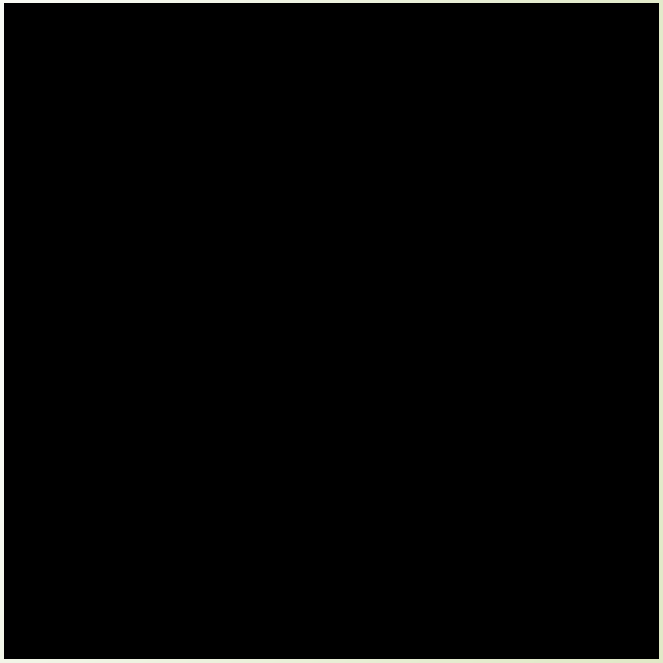
- Input: First the path is taken as an input from the user for the location of images which has to be detected for the masking.
- Then a variable is instantiated to store all the images which have jpg extensions.
- The images are then resized so that there wont be any discrepancies for detecting the smear and masking it. The problem which occurs is that not every image has same size, second factor is that the smear are on disparate positions due to that if the size differs the masking may not be proper.
- The image is then blurred so that the edges can be uniform.

- The pixels are added together and mean is taken and BGR color is changed to GRAYSCALE
- To be able to detect the blur caused due to the smear we will apply threshold comparison on the images for better accuracy.
- Threshold: First argument in calculating threshold is that image should be grayscale. Therefore we use the image obtained in above step. If pixel value is less than the threshold value which 100, it is assigned one value (black), else it is assigned another value (white).
- So the threshold in our approach was if the value acquired is less than 105 i.e. threshold value then it is assigned one certain value(black) and if its more than that then other value(white).
- After that the values are inverted hence masked. To this we then find contours hence our smear detection is complete.

Result

The results below show that there is no smear detection and hence masking.

Mean Image

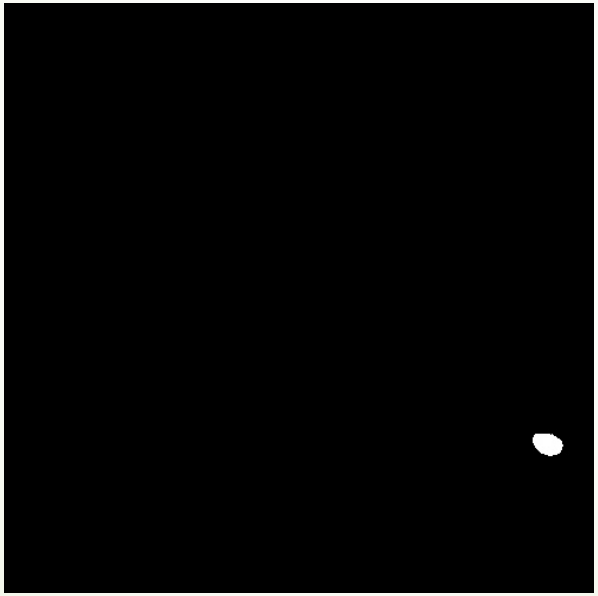


Mask Image

Result

In this the smear is detected.

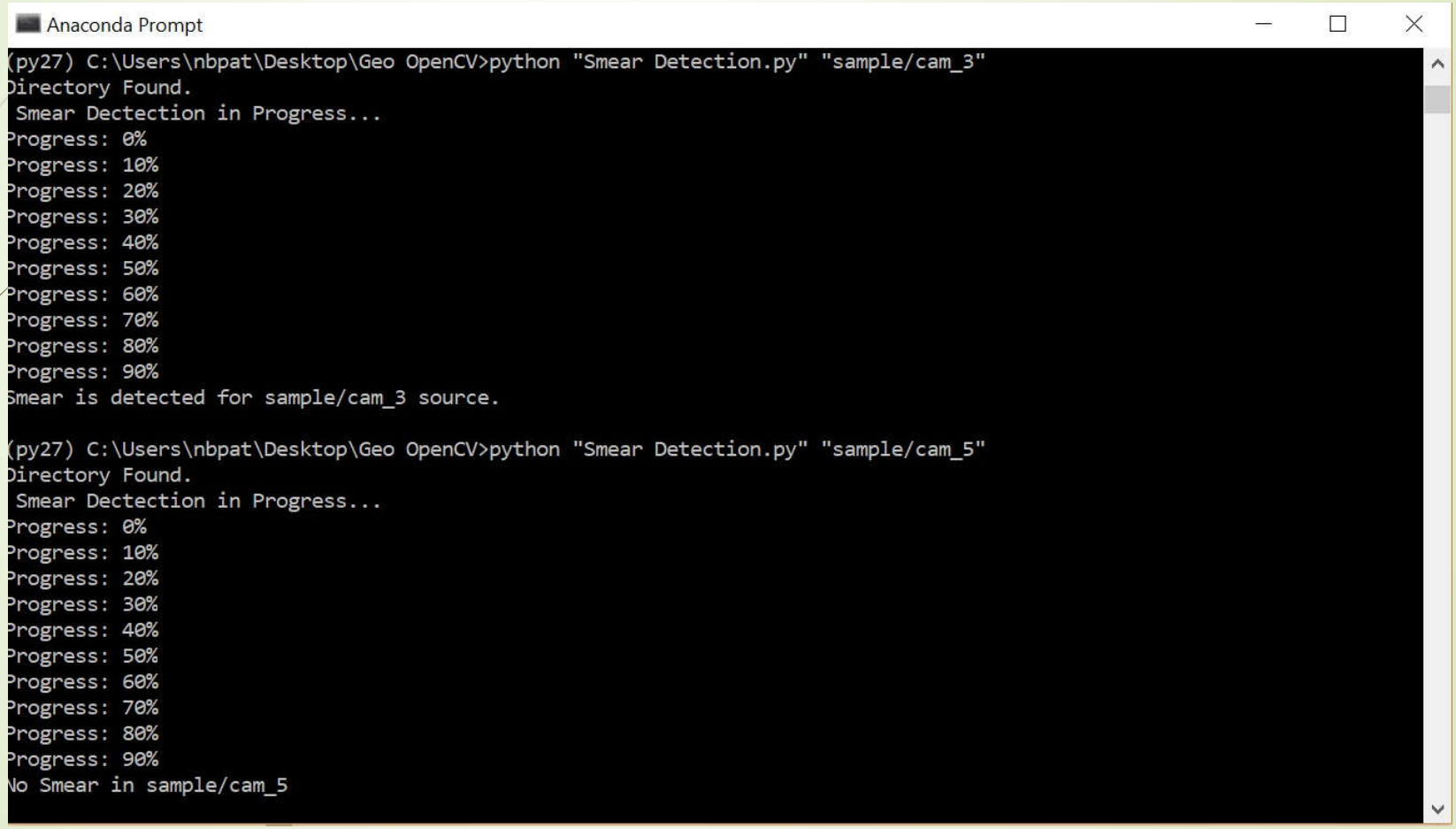
Mean image



Masked Image

Smear Detected

Execution


Anaconda Prompt
(py27) C:\Users\nbpat\Desktop\Geo OpenCV>python "Smear Detection.py" "sample/cam_3"
Directory Found.
Smear Dectection in Progress...
Progress: 0%
Progress: 10%
Progress: 20%
Progress: 30%
Progress: 40%
Progress: 50%
Progress: 60%
Progress: 70%
Progress: 80%
Progress: 90%
Smear is detected for sample/cam_3 source.
(py27) C:\Users\nbpat\Desktop\Geo OpenCV>python "Smear Detection.py" "sample/cam_5"
Directory Found.
Smear Dectection in Progress...
Progress: 0%
Progress: 10%
Progress: 20%
Progress: 30%
Progress: 40%
Progress: 50%
Progress: 60%
Progress: 70%
Progress: 80%
Progress: 90%
No Smear in sample/cam_5

Conclusion

- Smear is detected on camera lens and is highlighted by yellow color.