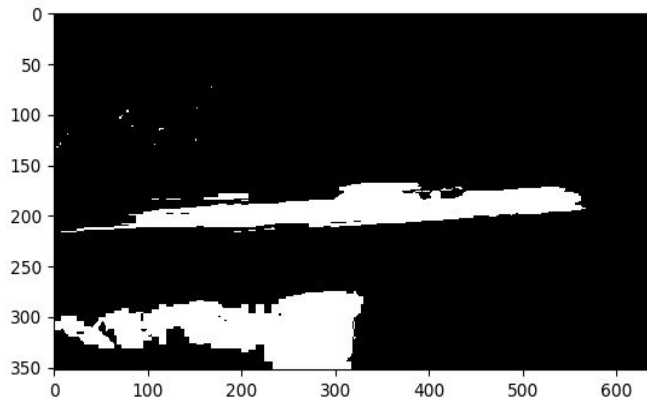


## **Task :**

To detect the defect in the rod from the given video.

### **Algorithm 1:**

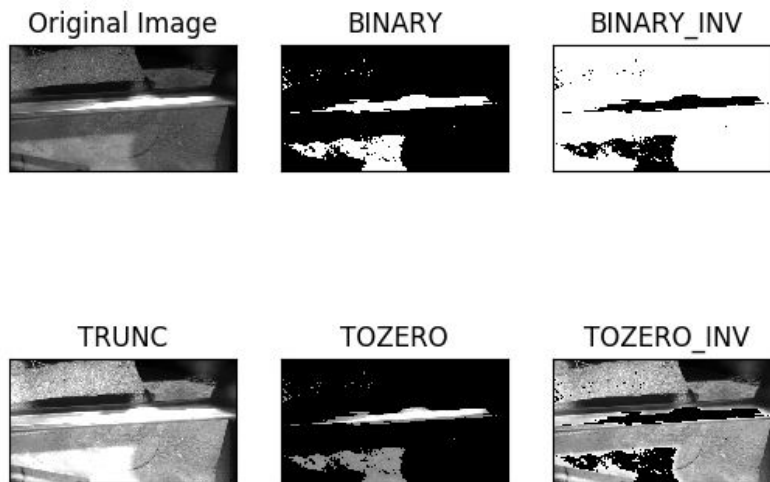
1. Initially, the whole video is being converted into frames. Total number of frames being 132.
2. Now, Binary thresholding using the OpenCV library in Python has been implemented on the images.



Frame 45-after Binary Thresholding

(Note: Defect on the rod is at approximate location (450,250) in the above image)

When applied other thresholdings on the frame:



So, among all the above, chose Binary Thresholding for better results.

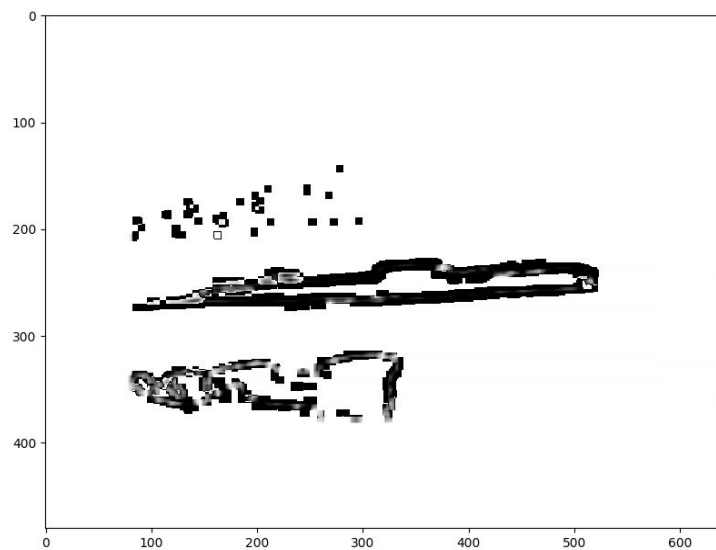
3. Then, converted the image into 2D (Gray image). Used OpenCv function to convert colored image to gray.

4. Now, I have chosen, the middle frame (approx)-Frame number 45, as my base image and compared other frames wrt this base frame. (Note: chose this frame randomly and was given better visible result when compared to the first frame)

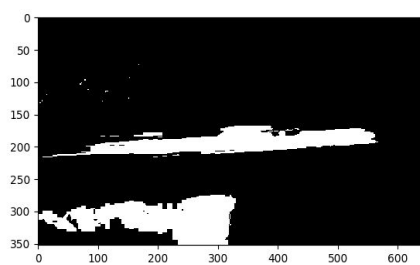
5. Used Structural similarity Index to compare any two images. Used `compare_ssim` function from the skimage library.

6. `compare_ssim` has two return values. One being `diff` (a 2D matrix of differences between two images given in the argument), and other being `score` (it is given on the scale of  $[-1,1]$ , where 1 indicates perfect match)

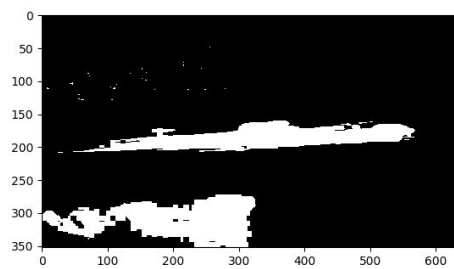
7. The part of gray color shows the area of defect.



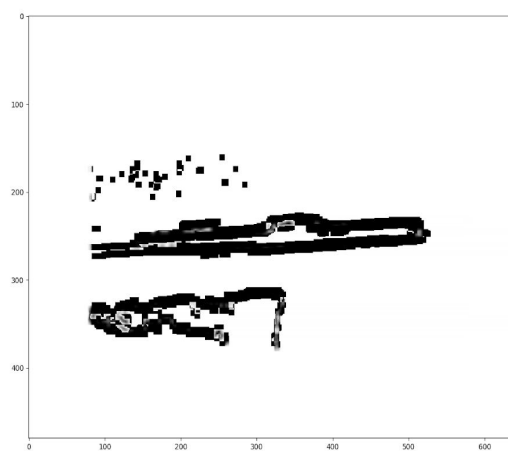
Difference between frames 45 and 32



Frame 45

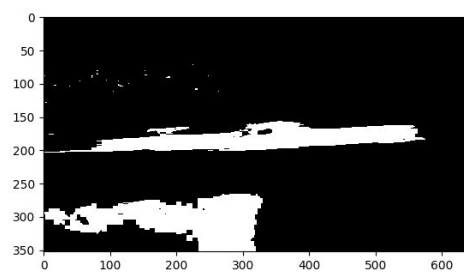


Frame 32

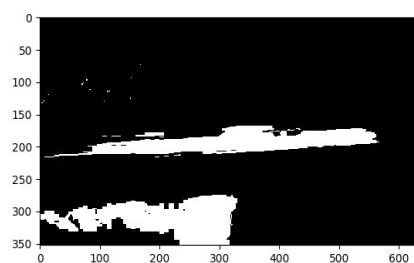


and 62

Diff between frame 45



Frame 62



Frame 45