DAIICT

Assignment 2

Advanced Image Processing

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14-2-2021

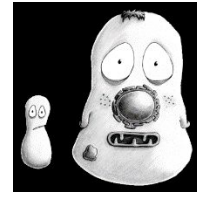# Table of Contents

Task 1

Problem Statement

Consider Figure 1 and remove the larger object from the image

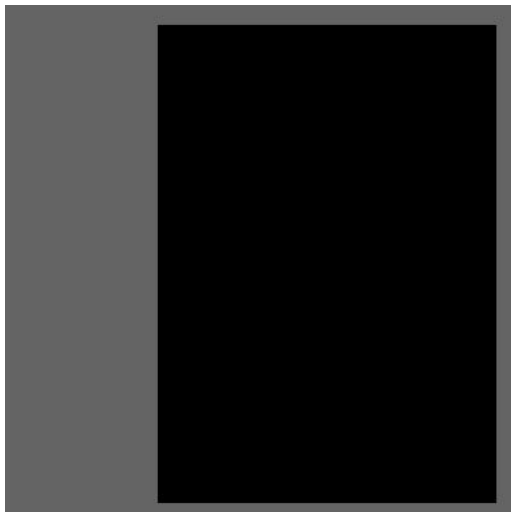## Library Used: OpenCV

Method

1. Clipped larger object in image using the function:

   cv2.copyTo(image, mask image)

   Return:

   This function will return clipped image

2. Mask was created by manually setting the values in a numpy array

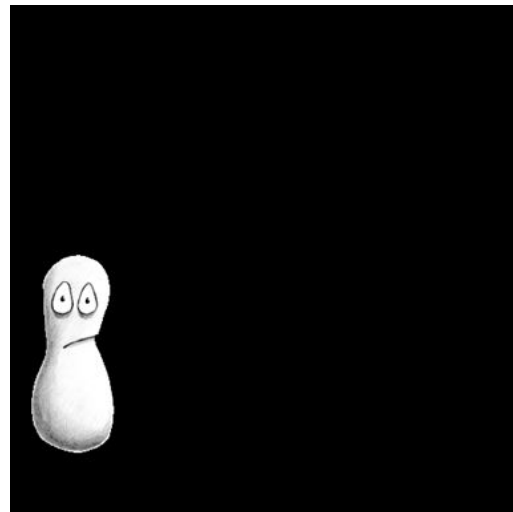## Observation

Mask: Result after applying mask:

Conclusion

● The above mask when applied on the image removes the larger object for the given image.

Task 2

Problem Statement

Consider Figure 2, and find out whether a motion has occurred between (a) and (b)

Library Used: OpenCV

Method

1. Find different between 2 images

   **cv2.absdiff(image 1, image 2)**

   This function will return an absolute difference between 2 images and if we get a difference value then motion exists else not.

2. To consider only significant change in pixels in images, this function was used with the above function with a threshold of **65** and maxval of **255**:

   cv2.threshold(diff_image, threshold, maxval, cv2.THRESH_BINARY)

Observation

Result after cv2.absdiff():
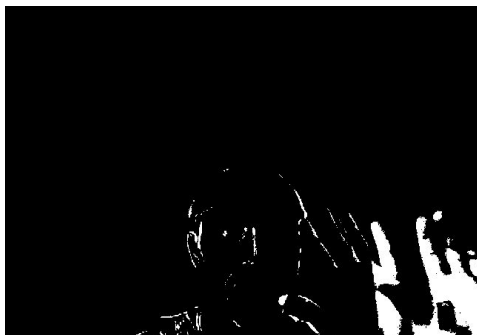
Conclusion

- We have detected 4.11% change between the given 2 images which shows that motion exists in given images.

Task 3

Problem Statement

Implement an algorithm to find out the number plate given in Figure 3(a) within the image Figure 3(b)

Figure 3(a)

Figure 3(b)

Library used: OpenCV

Method

1. Template matching function

   cv2.matchTemplate(Grey scale image, template image, matching function)

   <u>How does the function work?</u>

   Template image will work as sliding window and compare with every pixel in the image in give result

   <u>Matching Function:</u>

   'cv2.TM_CCOEFF', 'cv2.TM_CCOEFF_NORMED', 'cv2.TM_CCORR', 'cv2.TM_CCORR_NORMED', 'cv2.TM_SQDIFF', 'cv2.TM_SQDIFF_NORMED'

   <u>Return Value:</u>

   Function returns array of size (a-p+1, b-q+1) with the matching score of sliding windows in range of -1 to 1.

2. Bounding box

cv2.rectangle(image, start point (x, y), end point (x, y), color (R, G, B), thickness)

Observation

Detected number plate highlighted by a bounding box:

Conclusion

- Number plate was detected in the main image by using the template matching function of OpenCV library.