• What did you learn after looking on our dataset?

Major I found out , you have used 4 camera c10,c20,c21,c23 as ids to captures images and each camera captures different images.

C10 camera capture:126 images

C20 camera capture:324 images

C21 camera capture : 145 images

C21 camera capture 484 images

And I grouped images on camera ids and each images have different solution.

Especially, images have glaring effect and different light intensity with same background. When take difference light intensity and glaring effect influence more.

Image capture by c10 camera, are bit curve less then 180 degree like fish eye image, I tried to defisheye image it, but it was losing information, I spend more time on it .

How does you program work?

1. Load the images dataset by sorting label file name after zipping it.

```
def load_images_from_folder(folder):
```

2. Analysis on image dataset.

```
def number_camera(cv_label): camera analysis
```

```
def checking_shape_total(c_img): dimension
```

3. Grouped the images on camera id.

```
def grouping_imges_ids(cv_label,cv_img): group images on ids camera
```

4.check the dimenension of each grouped images

```
def checking_shape(c_img):
```

5. resize the all images (larges to small size for better)

```
def resize_images(cv_img,w,h):
```

6. handle the glare effect , detect glare and remove the glare from each images using cv2.inpaint.

```
def glare_effect(cv_img):
```

7. we find the original image image with all other image , elimate duplicates big o nsquare by eliminating duplucates on score:

```
def find_orginal(list_img,c10_path):
```

e.g

```
a = [3,4,6,1,5,2,1,1,2,3,4,2,3]
for i in range(len(a)-1):
  for j in range(i+1,len(a)-1):
    if a[i] == a[j]:
      a[j] = ""
[3, 4, 6, 1, 5, 2, ' ', ' ', ' ', ' ', ' ', ' ', 3]
```

---

9. I retain the original image path after removing the null in list to show the original images.

```
def clean_list(original_list):
```

10. Using function get duplicates taking difference between original and all list

```
Duplicate list = list(set(c10_path) - set(original_list_10))
```

Where original list difference between he all the image list we return with duplicates list.

Display original images

```
display_original(original)
```

11. using this duplicate list we remove image from folder.

```
def delete_dups(list):
  for i in list:
    os.remove(i)
```

What values did you decide to use for input parameters and how did you find these values?

Minimum contour to use is 500, because change are any object appear in image is small , its trade off because of lightning effect sometimes showdowns contour is big than object appears to tackle I tried to remove glare find the near and minute small change in images.

To smooth the image I use kernel size 5*5 , GaussianBlur

To detect and fill the glare I used threshold higher 180 to capture bright region an cv2.inpait 61 to fill it.

```
    # threshold grayscale image to extract glare
    mask = cv2.threshold(gray, 220, 255, cv2.THRESH_BINARY)[1]

    # use mask with input to do inpainting
    result = cv2.inpaint(img, mask, 91, cv2.INPAINT_TELEA)
```

Threshold I changed to I choose 120 above its white bellow of its black, I increases threshold to handle showdown and light. I tried with 200 but it was consider lighter white pixel to black resulting hard to make difference in little light effect

```
thresh = cv2.threshold(frame_delta, 120, 255, cv2.THRESH_BINARY)[1]
```

```
thresh = cv2.dilate(thresh, None, iterations=8)
```

What you would suggest to implement to improve data collection of unique cases in future?

While collecting data, we can look into point of view of camera for example we should try to capture the image with different of view to learn and need to handle the glare and light effect.

For example placing camera in right and optimized position

I feel we can used camera having less effect and able to handle galre and lighting effect shadows , it helps in the image to be and processing and prediction.

• Any other comments about your solution?

Main goal, is to handle the light intensity and glare because of different different image cant be different and in camera 10 id we can make rectangling the image because curve and lighting effect was more . we can used deep learning techninque to remove it .