Image Preprocessing

Two images were joined and processed in order to find a suitable image with clear edges.

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Preparing The Data

Starting with loading our Images, extracting their information like shape, size and data type.
In order to join two images, the tree image had to be resized first and since it had background, a mask was created. after joining the images, for more study, the histogram was drawn.

Information about our data

The Picture Shape: (224, 225, 3)
The Picture dtype: uint8

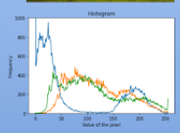
The Picture Shape: (179, 281, 3)
The Picture dtype: uint8

Joining them

cv2.resize()

cv2.addWeighted()

Masking

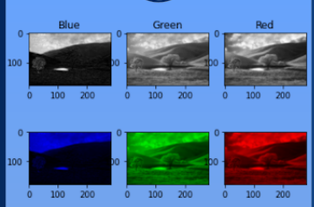


cv2.calHist

Making a Dataset

To get the best result by edge detections, we started to make a dataset of the image. The first three images were the original image split into 3 channels (red, green, blue). The next image is the result of the equalization on our image.

Splitting



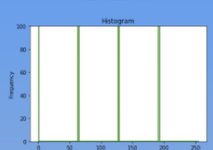
cv2.split()

Splitting the picture into 3 channels

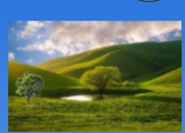
Color Reduction

Reducing Colors

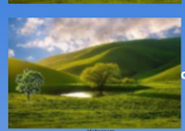
cv2.calHist



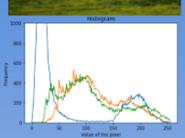
blure



cv2.blure()



cv2.GaussianBlur()

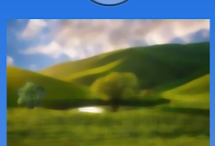


cv2.calHist

Making a Dataset

Bilateral filter and low pass and high pass filters such as Median blur, Erosion and Dilation were applied on the Image.

Filtering



cv2.medianBlure()

cv2.bilateralFilter()

Filtering

cv2.erode()

cv2.dilate()

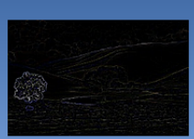
Edge Detection

As the next step, edge detectors (Sobel, Laplacian and Canny) were applied on all of the images above. Each one of them had better result on one of the images. the bests of each edge detector is shown. The most clear image is cv2.canny (L2gradient= False) on the image with Gaussian blur on it.

Sobel

cv2.Sobel (dx=1,dy=0)

Most clear on bilateral image



cv2.Sobel (dx=0,dy=1)

Most clear on dilated image

Laplacian & Canny

cv2.Laplacian()

Most clear on dilated image

cv2.canny (L2gradient= False)
Most clear on Gaussian image

cv2.canny (L2gradient =True)
Most clear on Gaussian image

Combination of the image and the edge detection

With comparing the Images, it was observed that if we combine Bilateral and Gaussian filters, the result gets more clear. After finding the most clear image for edges, it is joined with the original image to see the result.