Report

Image Segmentation

Varying Box size

Result of the segmented output is depending upon the box, if box size is tighter then more background pixel is there for train purpose and behalf of that clustering occurred but in case of loose bounded box many pixels are same in both BG/FG which are difficult for segmentation, so output we get better in case of tight box than loose box.

Box size varry **(1)** **(2)**

(3) **(4)** **Original Image**

Various changes in GMM components

Form the changes in the GMM component we observed that lower value of component means Gaussian mixture model clustered the pixel on behalf of that component, which defines the number of similar sets of color intensities so same intensity value are clustered in a similar

range. For ex. In image 10 colors are there but in bounded box color are about 3 so after segmentation it gives result as depend on the Gaussian mixture component i.e., n = 1, n=2, n=3, n=4 in these four cases it will give better result if Gaussian mixture model component is 3 so we tunned hyperparameter n component with color of interest that we segment that part of image.Some time it gives wrong result if we select any color which amount are low in and in this case, we get wrong result. for correct result draw tight box around object interest.

Original Image **GMM component** **comp = 1** **comp = 2**

comp = 3 **comp = 4** **comp = 8**

Varying number of iterations

As we increase number of iterations foreground intensity value selected more correctly and remove background pixel, and we get more accurate result from previous iteration step result. Because after each iteration we get better Background and Foreground Pixel for train purpose of Gaussian mixture model.so that why we get better result after each next iteration.

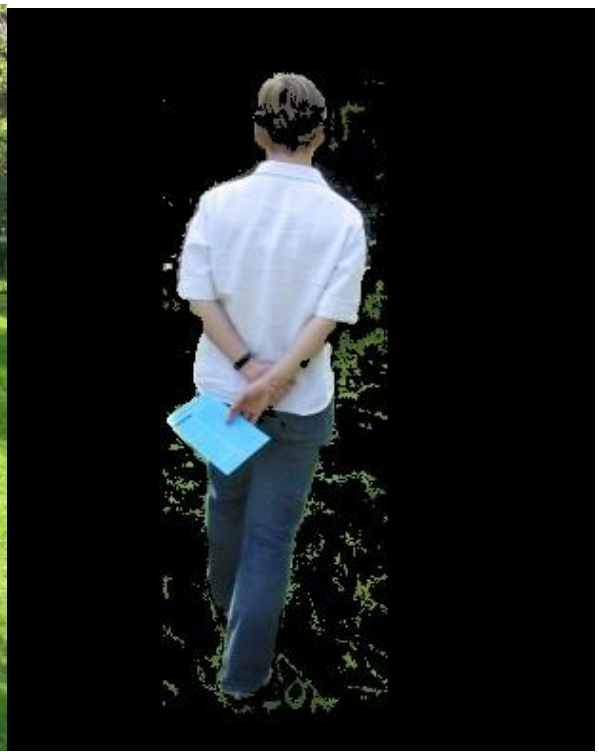
Original Image

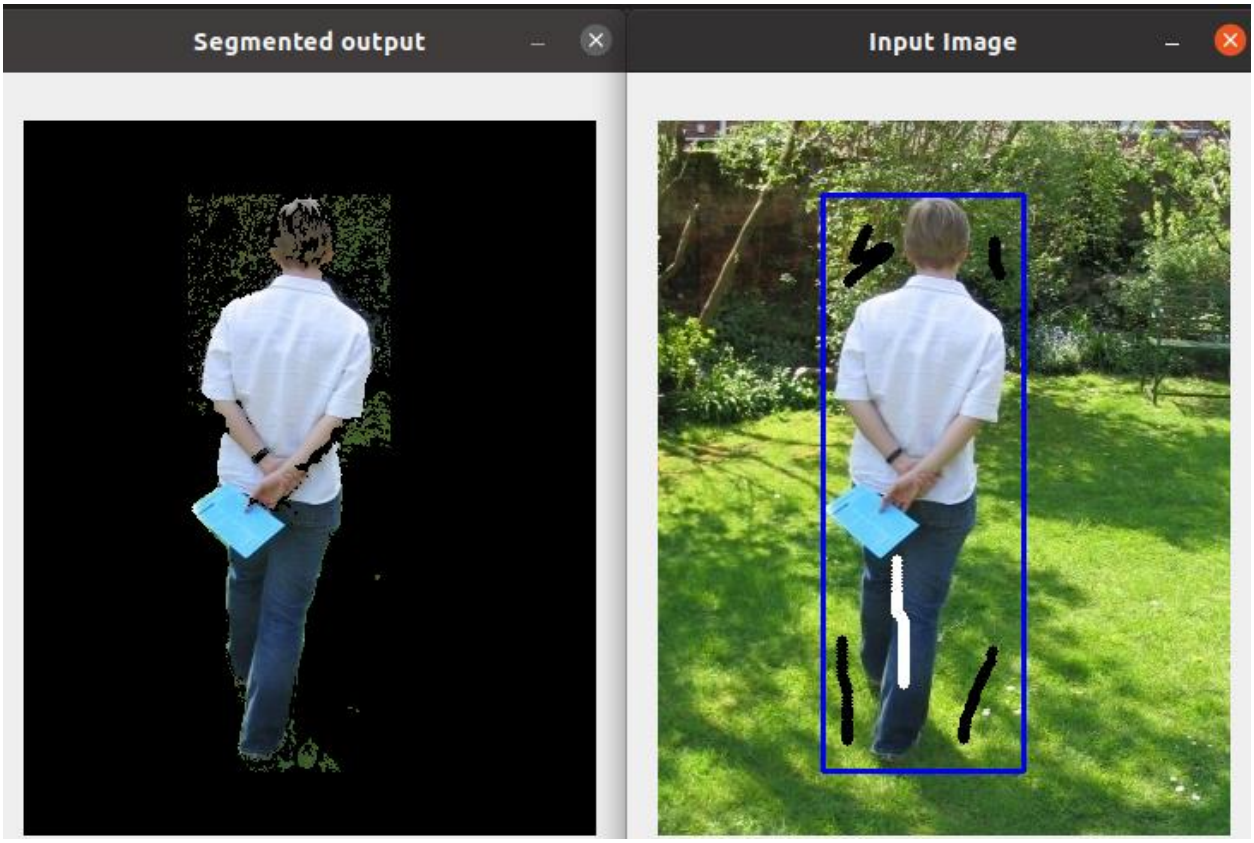
Iteration 1

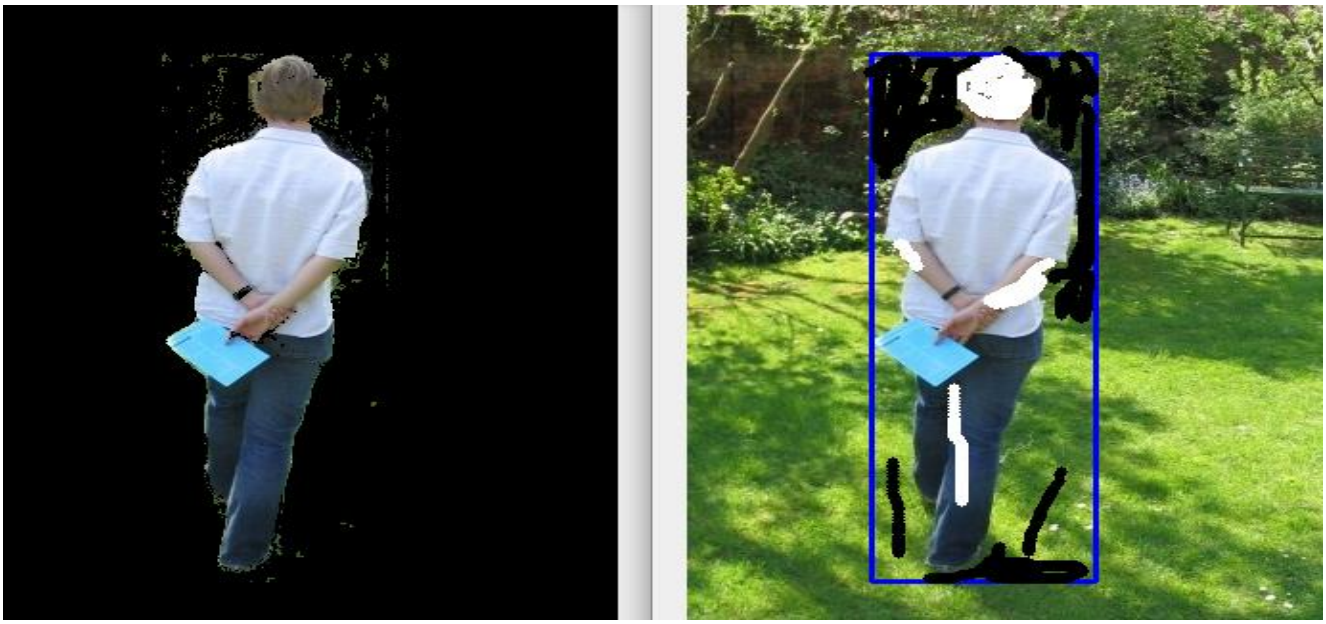
Iteration 2 **Iteration 3** **Iteration 4**

User interaction

User help model and mention background and foreground pixel on behalf of that Gaussian mixture model again train and after, accordingly mask is computed. So, user interaction is also used for getting better segmented output.




Segmented output
Input Image



Conclusion

Draw tight box for better clarification of Foreground and Background pixel

Tuned hyperparameter on behalf of selected foreground.

No comment on iteration if we increase iteration get better result.

Draw bounding box in clever way and depend upon the segmented output we wants

Some others segmented images

Segmentation applied on low quality image

segmentation appled on actual image.

Variations in Gamma values

Original Image

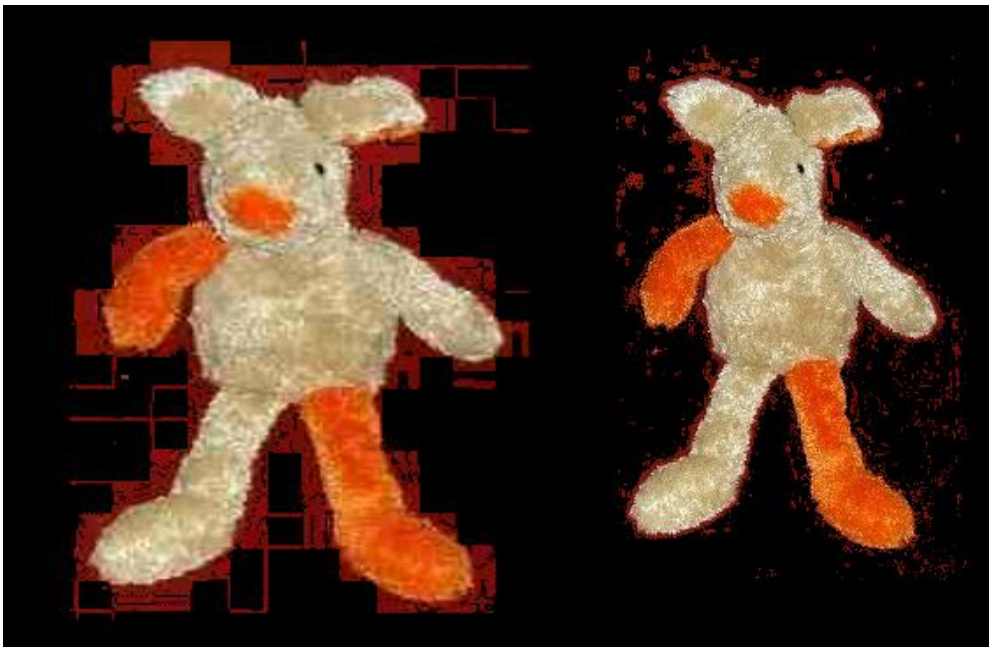
Reduced size of original image

Gamma = 1

Gamma = 10

Gamma = 50

Gamma = 100



Gamma = 500 **Gamma = 50 and on original image**

Here we see that the large and small value of gamma segmented output is not good compared to the gamma 50 and 100.

As in the paper given Gamma = 50 is good so all operations like box, itr, components are done using gamma = 50