Grab Cut: An analysis of how the changes in parameters affects Segmentation results

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The following report is going to present the analysis of the impact on output image after image segmentation per Grab cut algorithm

1. **The number of iterations of GMM updating and energy minimization.**

   Following set of images illustrate that if we increase the iteration then we will get much more proper image that will match will the original image.

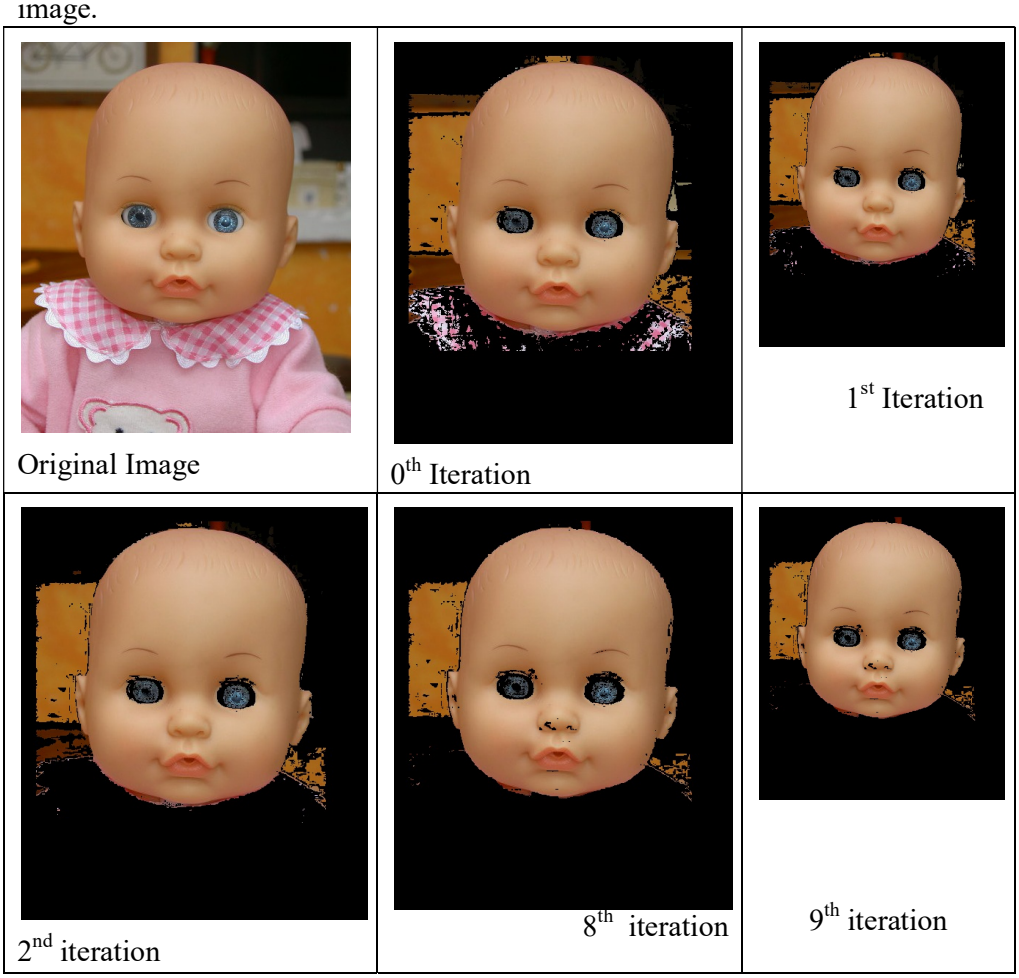


Figure1 : Dolls

2.The number of mixture components in your GMM.

Gaussian mixture components help us to learn wider range of colors for the foreground and background.If the number of components is very low, it will not

correctly categorize many foreground pixels if the foreground object shows wide variation in color combination. Also if the components are too many then additional pixel will be present in the segmentation of foreground objects. These are called hyper parameter and can be tune experimentally.

GMM=1

GMM=3

GMM=5

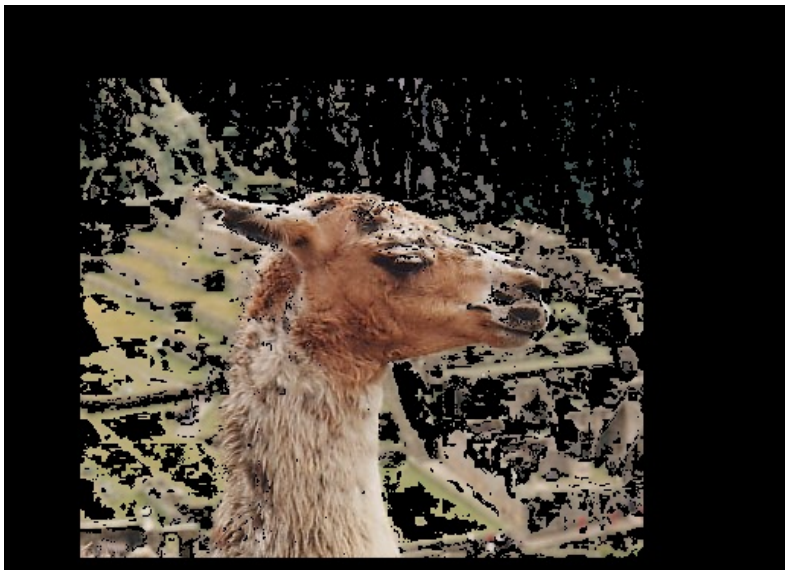
GMM=11

GMM=31

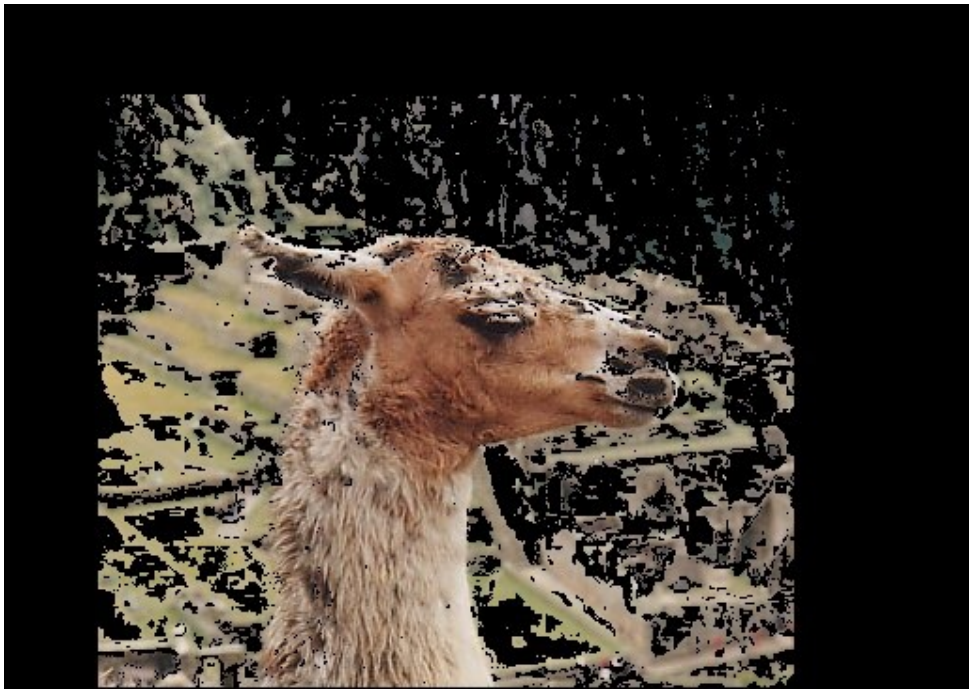
3.The choice of gamma.
Gamma is responsible for providing the pair wise potential values between any two pixels. It is a hyper parameter which needs to be determined experimentally. Too low or quite high value of gamma can wrongly classify the foreground pixels. Generally value of 50 or 100 for gamma provides a better classification of foreground pixels

Original Image

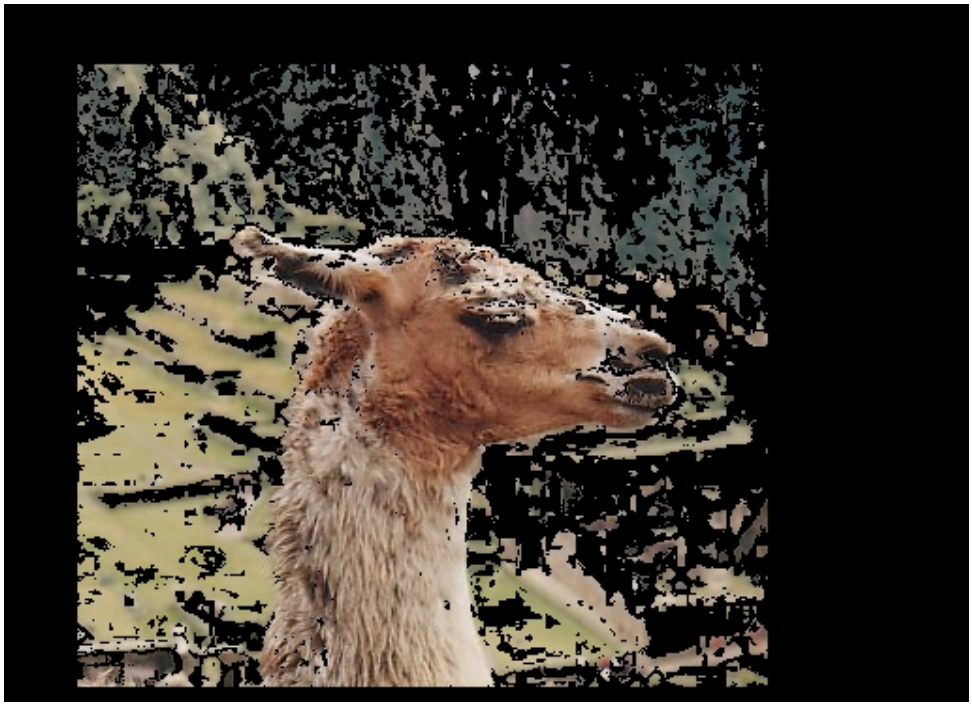
1.Gamma=.5,iteration =1



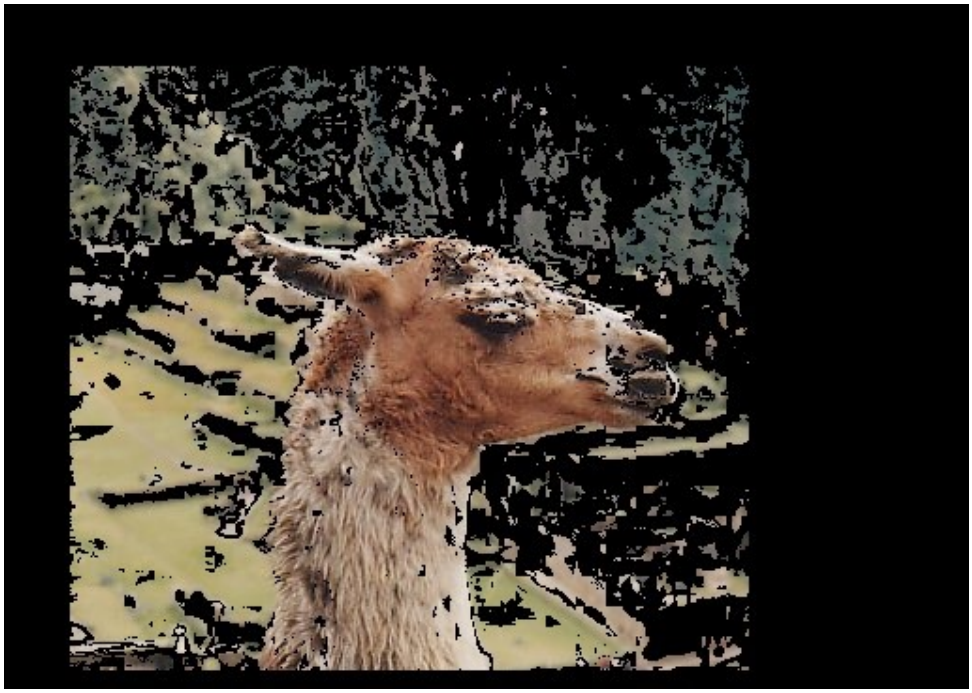
2.Gamma=1,iteration =1



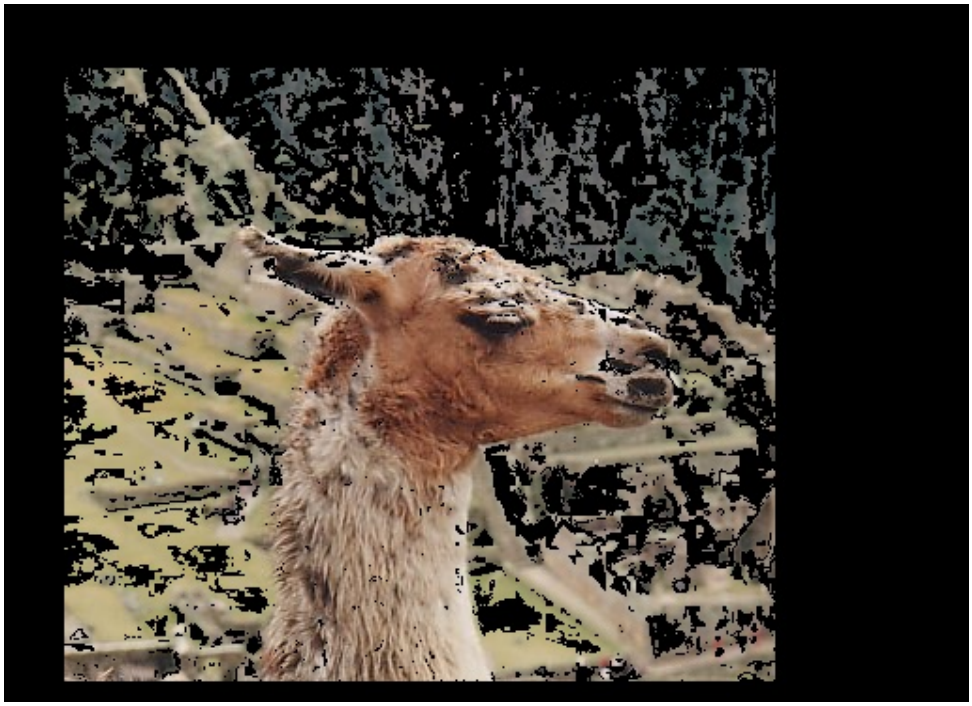
3.Gamma=50,iteration =1



4.Gamma=100,iteration =1



5.Gamma=1000,iteration =1



4 Neighbourhood vs 8 Neighbourhood

Using a 8 neighbourhood would result in a more continuous segmentation as the diagonal pixels would also influence the segmentation.