COMPUTER VISION

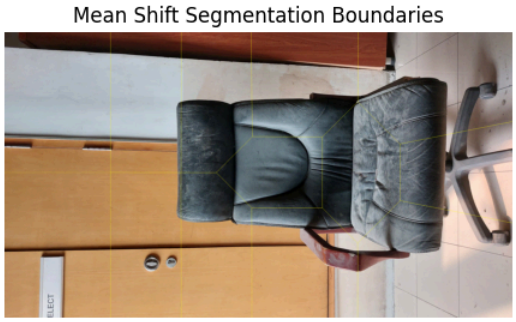
ASSIGNMENT 3
REPORT

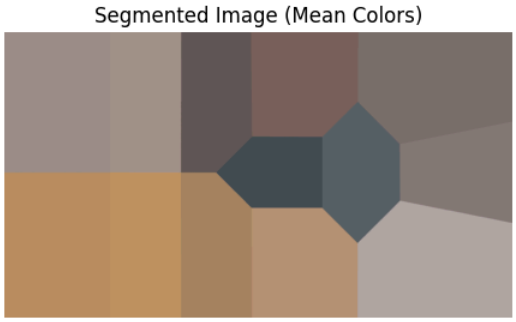
What is the basic concept of MS clustering?
Answer:
So basically in mean shift clustering we start from a random point and compute the mode of all the data points within a specific radius of that point. Then we shift our starting point to the newly computed mode point. We continue this until our window stops shifting. This means we have reached the most dense area in terms of pixel population in LABxy space or LUVxy space.

The bandwidth defines the radius of our circle that we shift throughout our algorithm. So low bandwidth means we have smaller regions but more. Larger bandwidth results in gernalized clustering means less number of segments. Bandwidth is computed by defining a quantile which tells what proportion of datapoints or pixels will lie within the radius of computed bandwidth. For quantile=1 all the data points will lie within the computed bandwidth which will result in 1 segment

How MS compares with SLIC in terms of segmentation?

As we can see we do get better segmentation using slic instead of meanshift. Slic is also significantly faster than the mean shift algorithm. Below is the example output for mean shift algorithm on quantile of 0.09

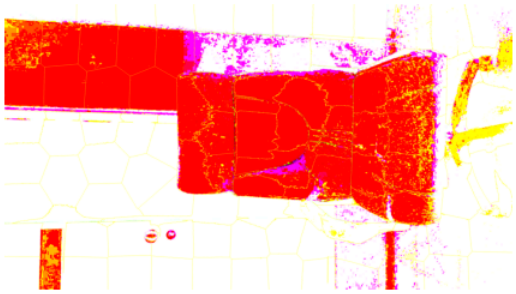




```
TERMINAL
rehanfarooq@rehanfarooq-HP-EliteBook-840-G4:~$ /bin/python3 /home/rehanfarooq/
anShiftSegmentation.py
Processing image: chair.jpg
Processing time for chair.jpg: 149.51 seconds
```

Here is slic on the same image with number of segments = 100 and compactness(weight given to proximity in calculating similarity) =40

SLIC Superpixels



Superpixel Average Color

```
TERMINAL
tation.py
Processing image: /home/rehanfarooq/cv/images/chair.jpg
SLIC segmentation processing time: 22.93 seconds
Clipping input data to the valid range for imshow with RGB data ([0..1
5] for integers). Got range [-16.471790988041178..100.0].
Superpixel averaging processing time: 7.76 seconds
Total processing time: 30.69 seconds
```