

all ImageSegmentation.java methods applied to a few pairs of images that are panoramic sets or stereo image sets with the goal of finding best segmentation for finding blobs to make matchable contours.

summary of next pages:

for brown & lowe 2003, best was KMPP w/ k=2

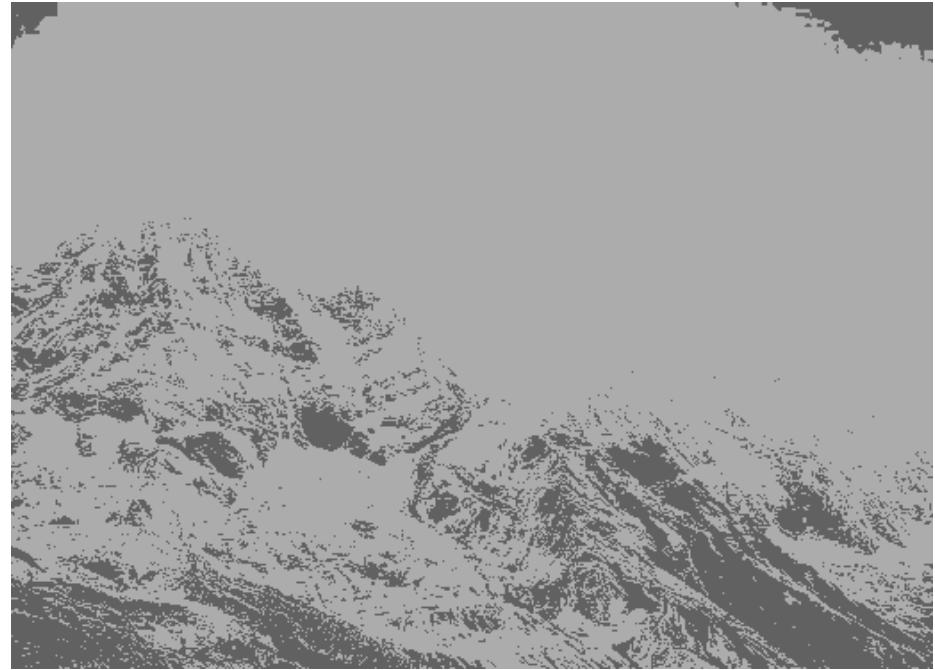
for Venturi, best was PolarCIEXYAndFrequency

for books, best was KMPP w/ k=2, 3 or 8

Venturi has lots of texture, so attempting a low resolution segmentation first is faster (the polar ciexy and frequency segmentation is  $O(N)$ ... check that).

Books best matchable features w/o illumination and projection differences are the text. The text needs further processing such as adaptive mean thresholding.

```
int kBands = 2; imageSegmentation.applyUsingKMPP(gsImg1, kBands);
```



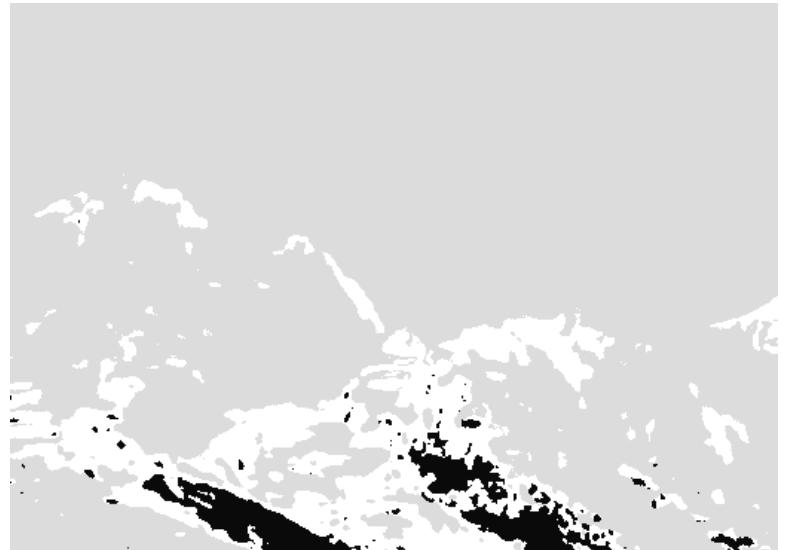
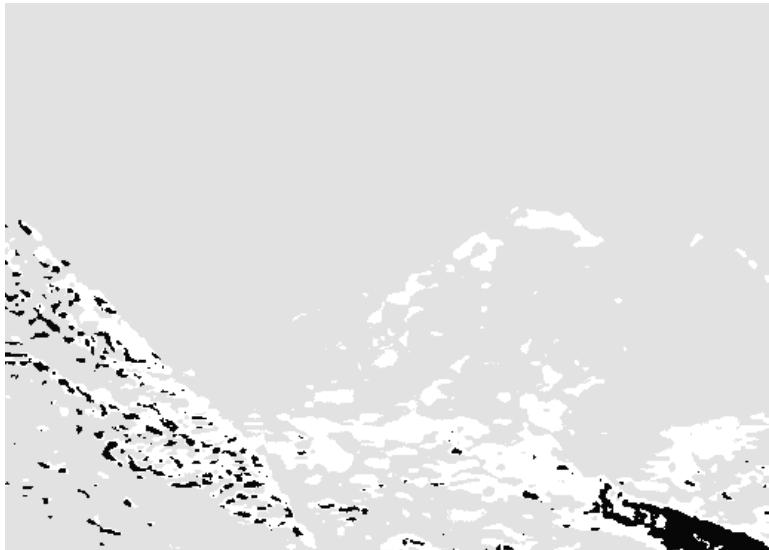
```
int kBands = 3; imageSegmentation.applyUsingKMPP(gsImg1, kBands);
```



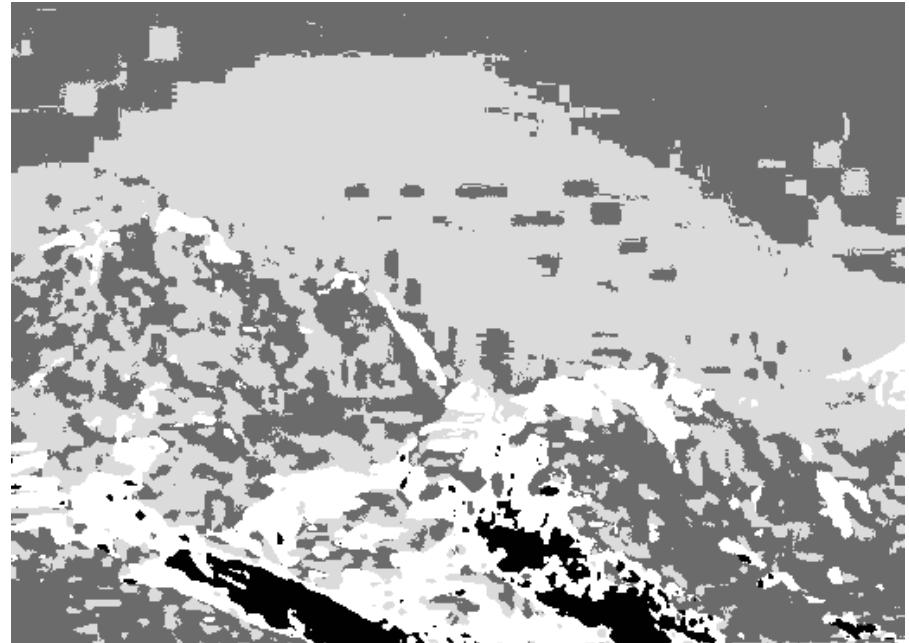
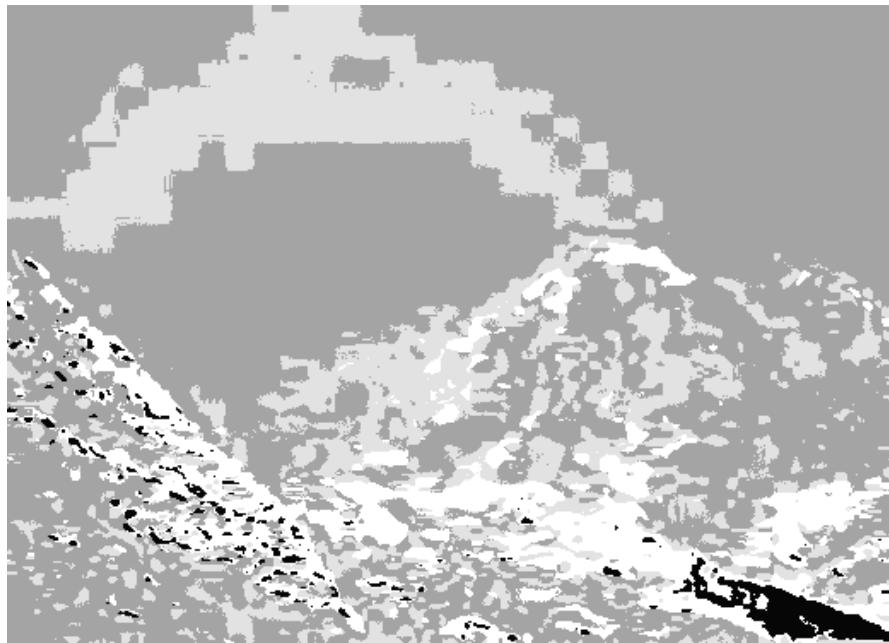
```
int kBands = 8; imageSegmentation.applyUsingKMPP(gslImg1, kBands);
```



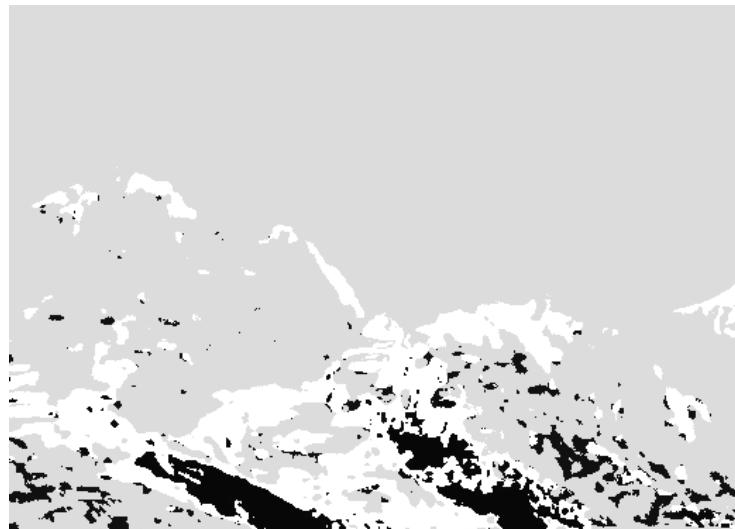
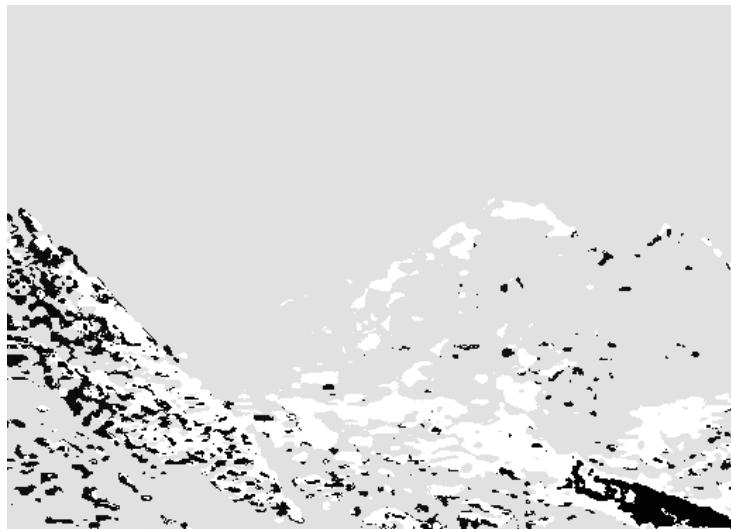
```
int kBands = 2; imageSegmentation.applyUsingCIEXYPolarThetaThenHistEq(gslImg1, kBands);
```



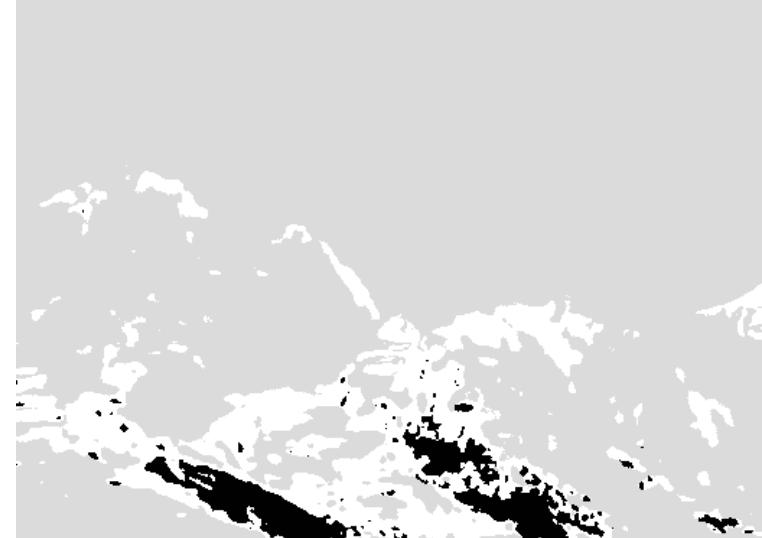
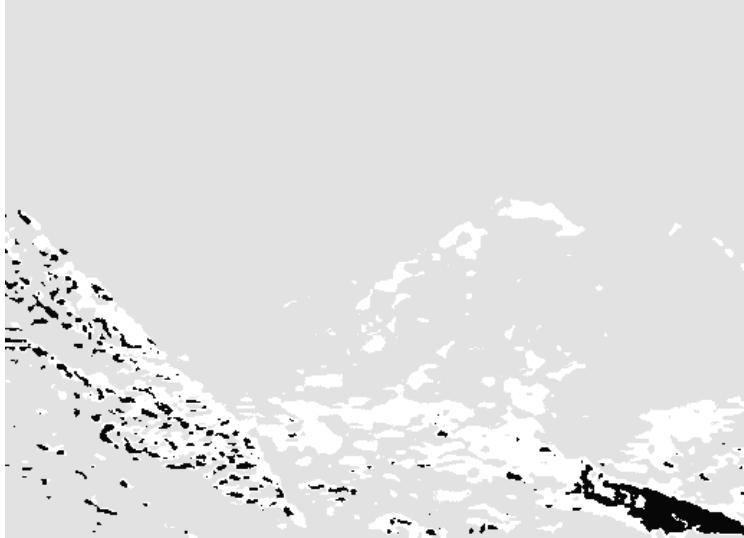
```
int kBands = 3; imageSegmentation.applyUsingCIEXYPolarThetaThenHistEq(gsImg1, kBands);
```



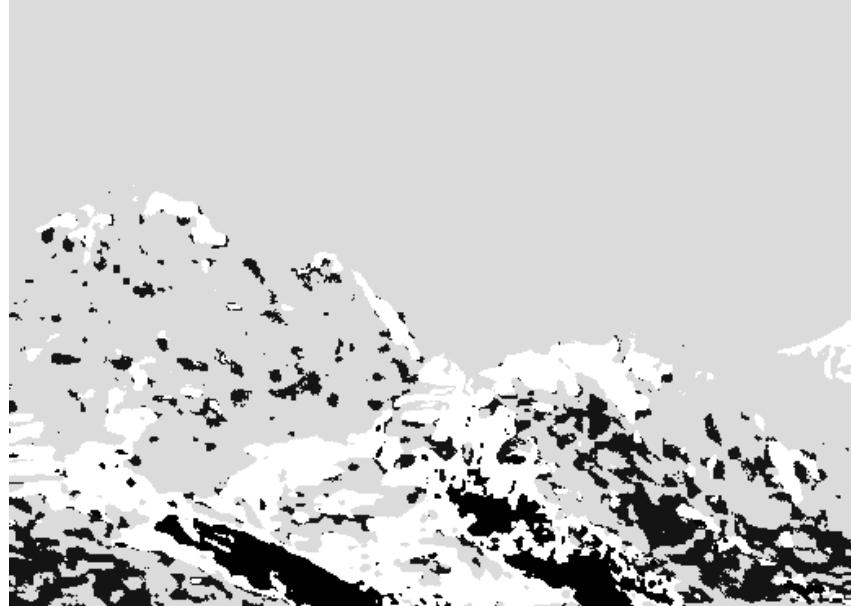
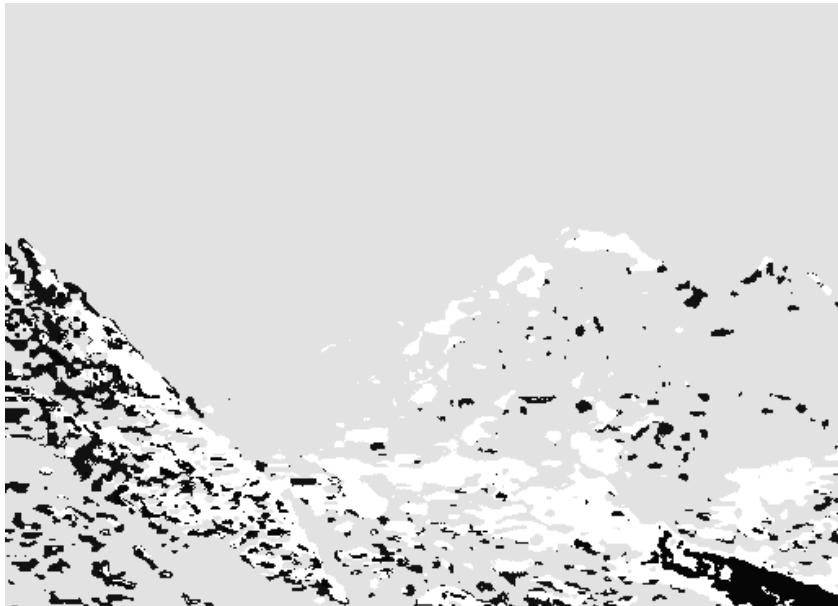
```
int kBands = 8; imageSegmentation.applyUsingCIEXYPolarThetaThenHistEq(gsImg1, kBands);
```



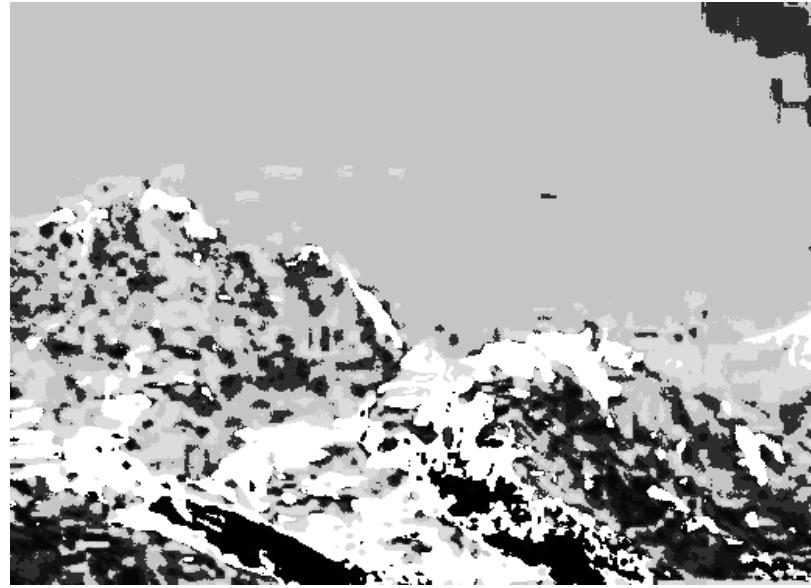
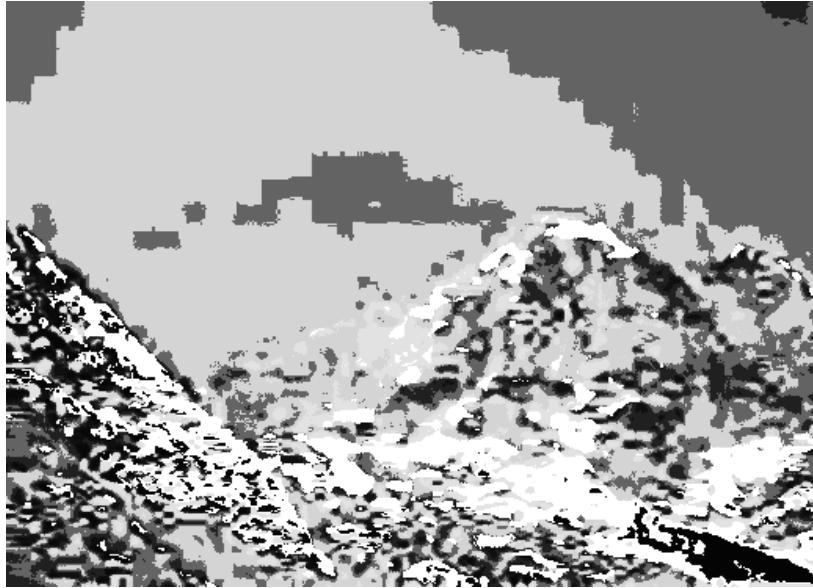
```
int kBands = 2; imageSegmentation.applyUsingCIEXYPolarThetaThenKMPPThenHistEq(gsImg1,  
kBands);
```



```
int kBands = 3; imageSegmentation.applyUsingCIEXYPolarThetaThenKMPPThenHistEq(gsImg1,  
kBands);
```

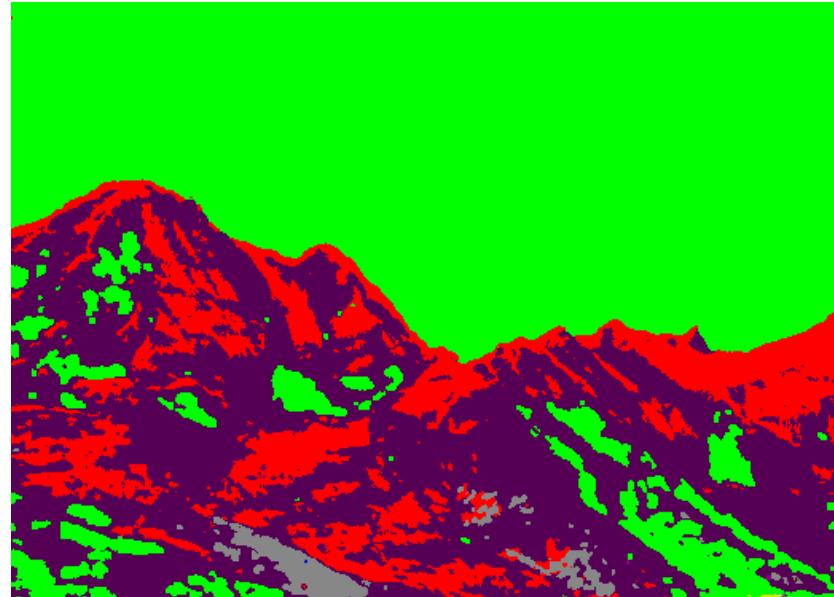
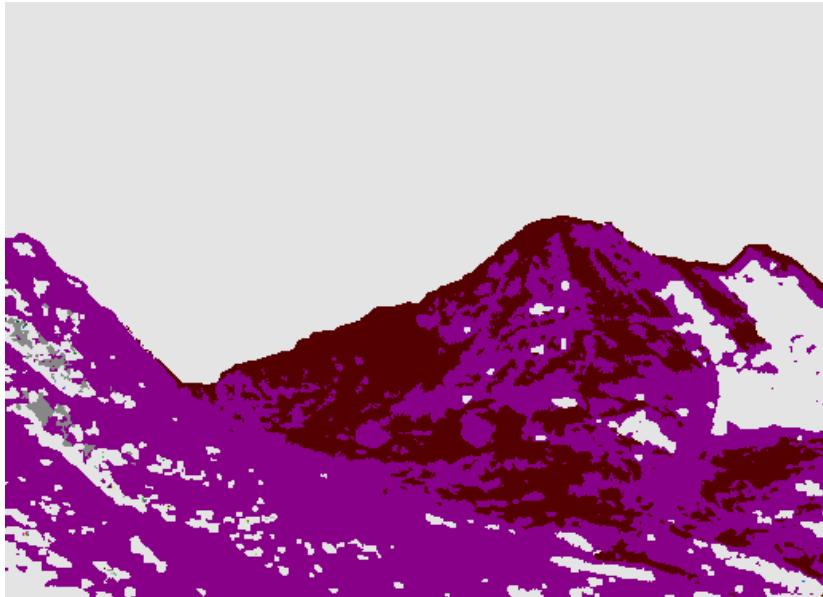


```
int kBands = 8; imageSegmentation.applyUsingCIEXYPolarThetaThenKMPPThenHistEq(gsImg1,  
kBands);
```

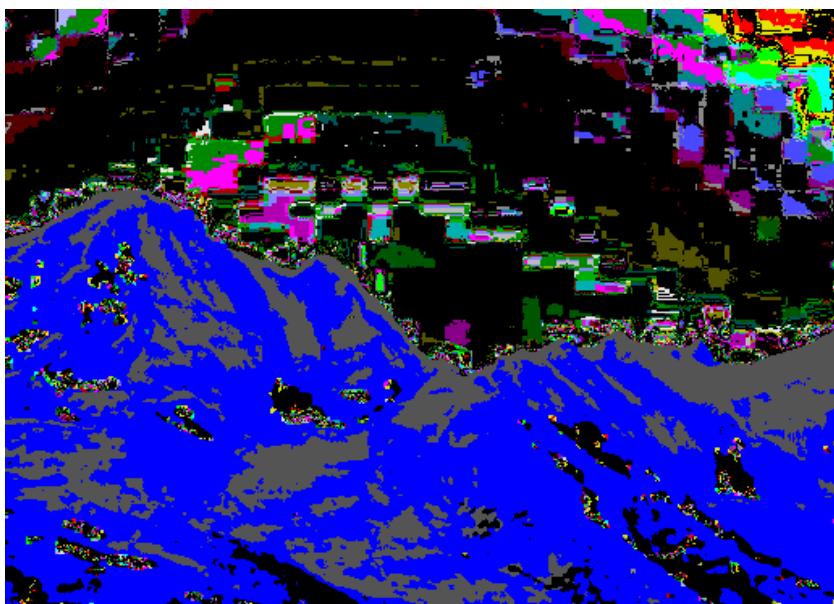
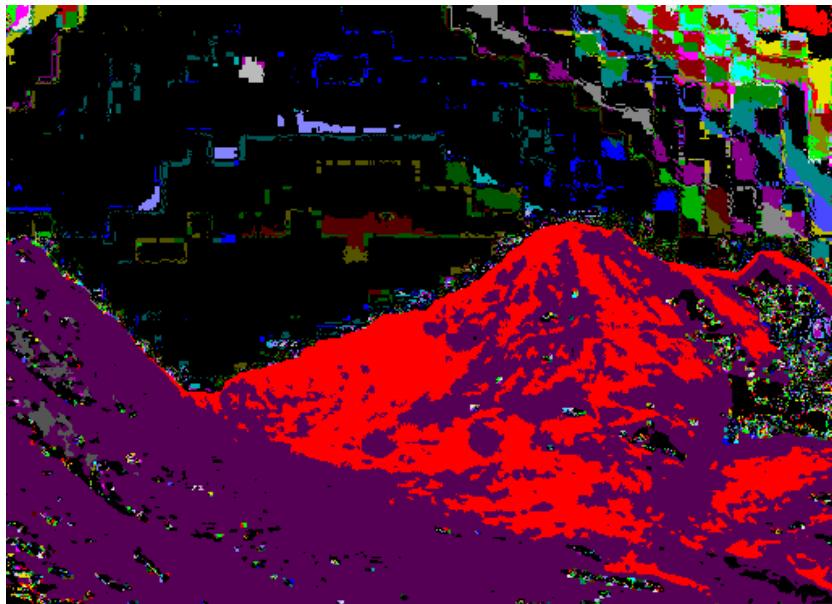


```
int kBands = 2; imageSegmentation.applyUsingCIEXYPolarThetaThenHistogram(gsImg1, kBands);
```

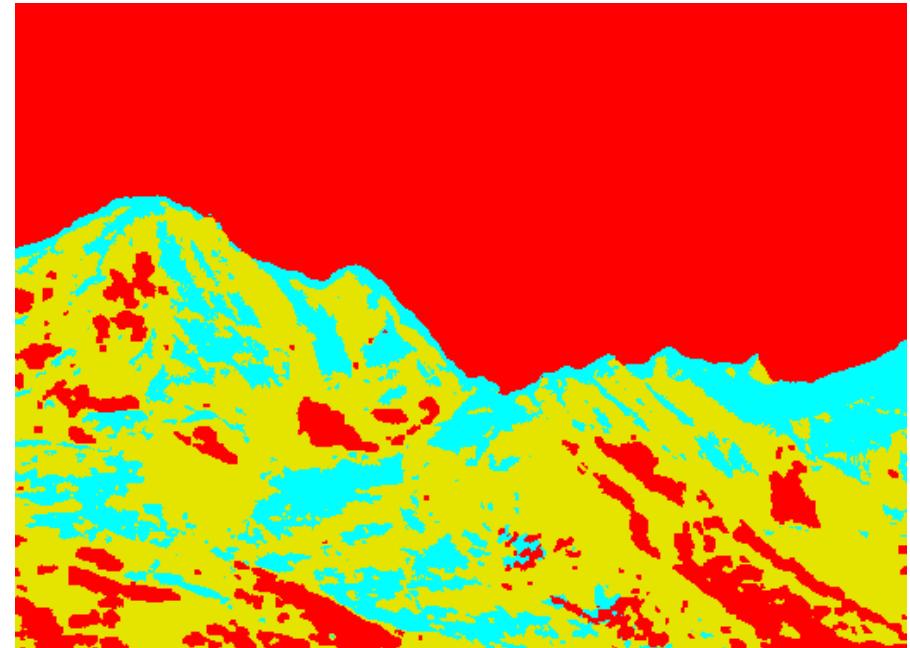
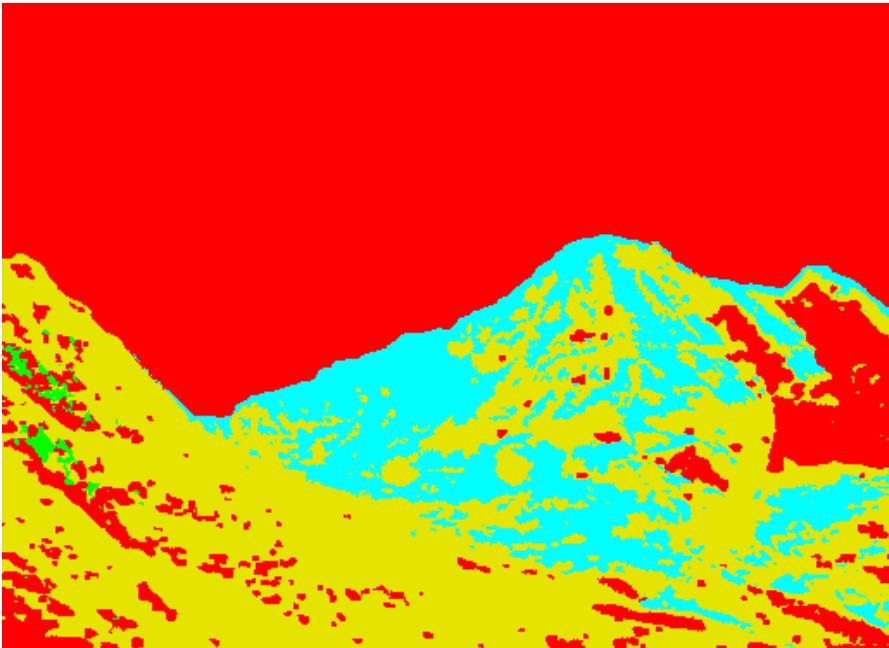
```
imageSegmentation.calculateUsingCIEXYAndClustering(gsImg1, true);
```



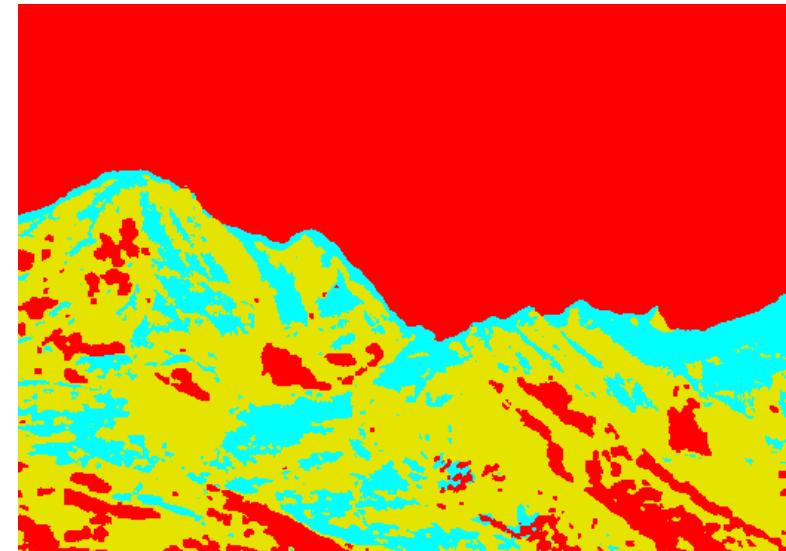
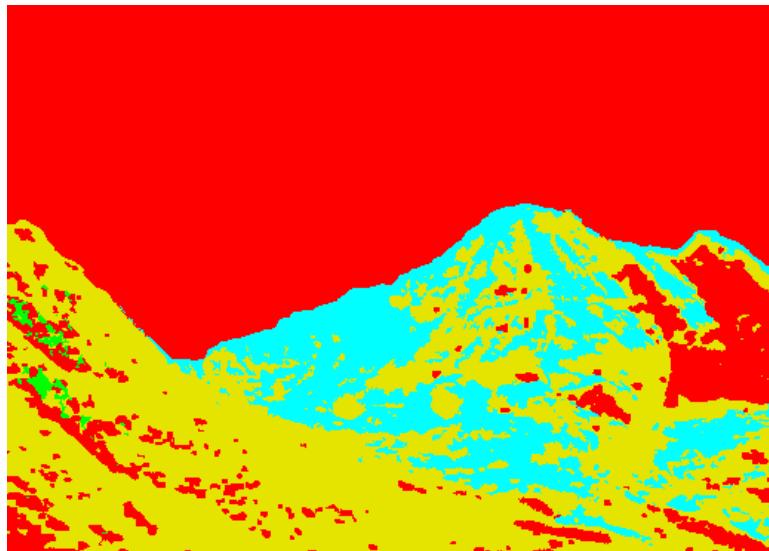
```
imageSegmentation.calculateUsingPolarCIEXYAndClustering(gsImg1, true);
```



```
imageSegmentation.calculateUsingPolarCIEXYAndFrequency(gsImg1, true);
```



```
imageSegmentation.calculateUsingPolarCIEXYAndFrequency(gsImg1, 0.2f, true);
```



```
int kBands = 2; imageSegmentation.applyUsingKMPP(gslImg1, kBands);
```



```
int kBands = 3; imageSegmentation.applyUsingKMPP(gslImg1, kBands);
```



```
int kBands = 8; imageSegmentation.applyUsingKMPP(gsImg1, kBands);
```



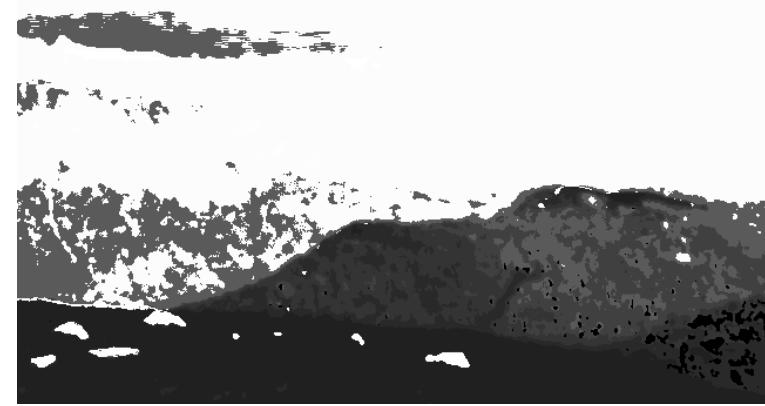
```
int kBands = 2; imageSegmentation.applyUsingCIEXYPolarThetaThenHistEq(gsImg1, kBands);
```



```
int kBands = 3; imageSegmentation.applyUsingCIEXYPolarThetaThenHistEq(gsImg1, kBands);
```



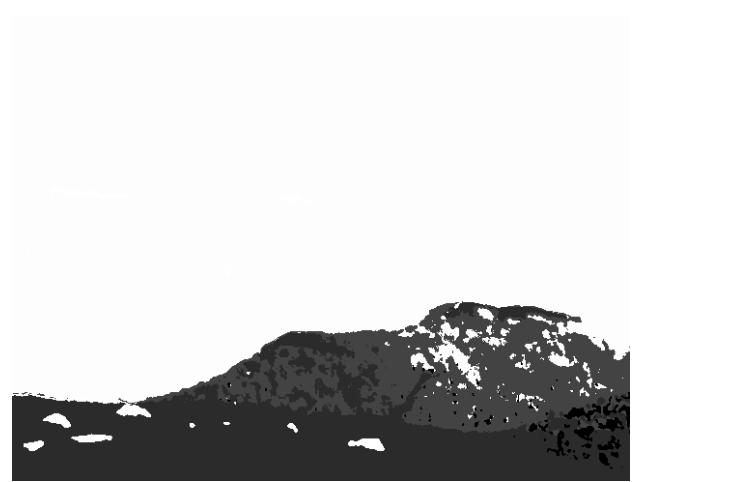
```
int kBands = 8; imageSegmentation.applyUsingCIEXYPolarThetaThenHistEq(gsImg1, kBands);
```



```
int kBands = 2; imageSegmentation.applyUsingCIEXYPolarThetaThenKMPPThenHistEq(gsImg1,  
kBands);
```



```
int kBands =3; imageSegmentation.applyUsingCIEXYPolarThetaThenKMPPThenHistEq(gsImg1,  
kBands);
```



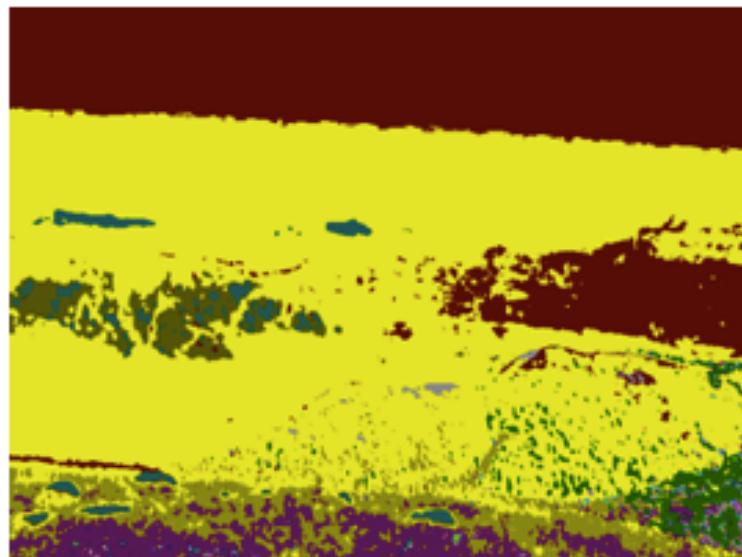
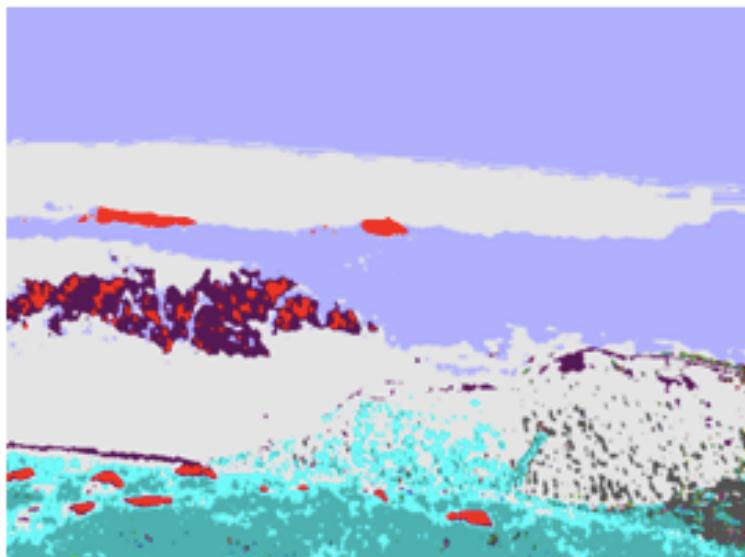
```
int kBands =8; imageSegmentation.applyUsingCIEXYPolarThetaThenKMPPThenHistEq
```



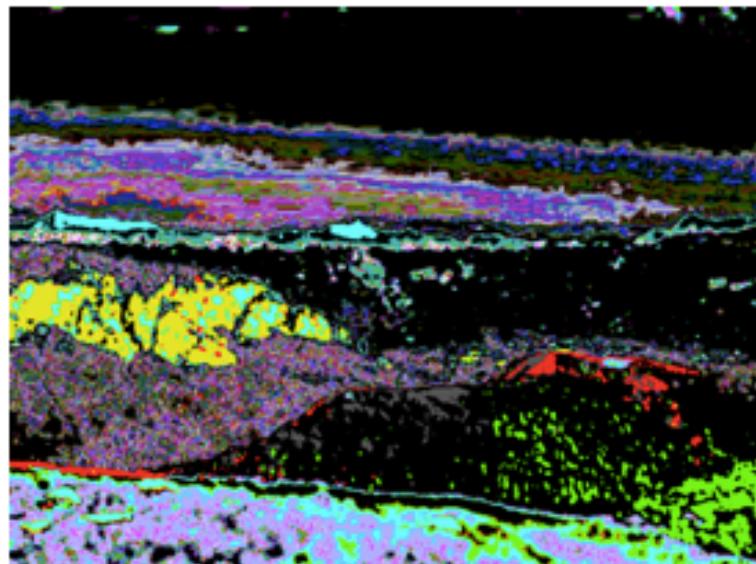
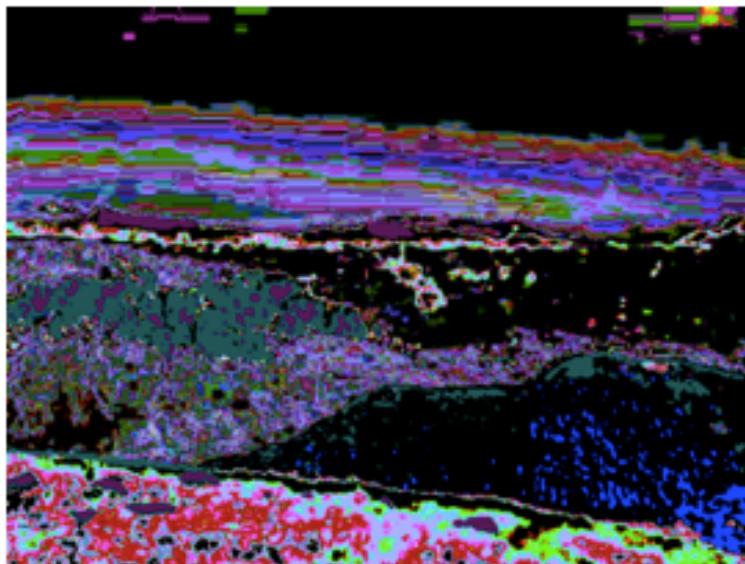
```
int kBands = 2; imageSegmentation.applyUsingCIEXYPolarThetaThenHistogram(gsImg1, kBands);
```



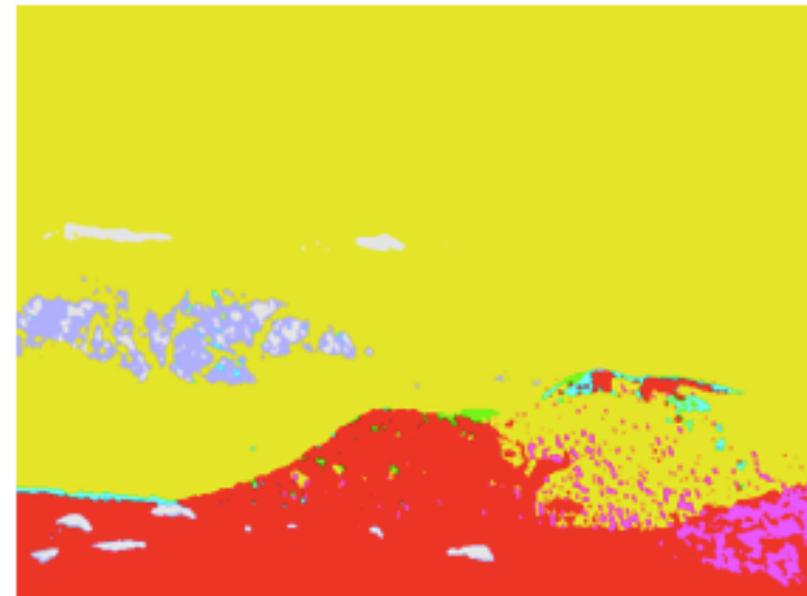
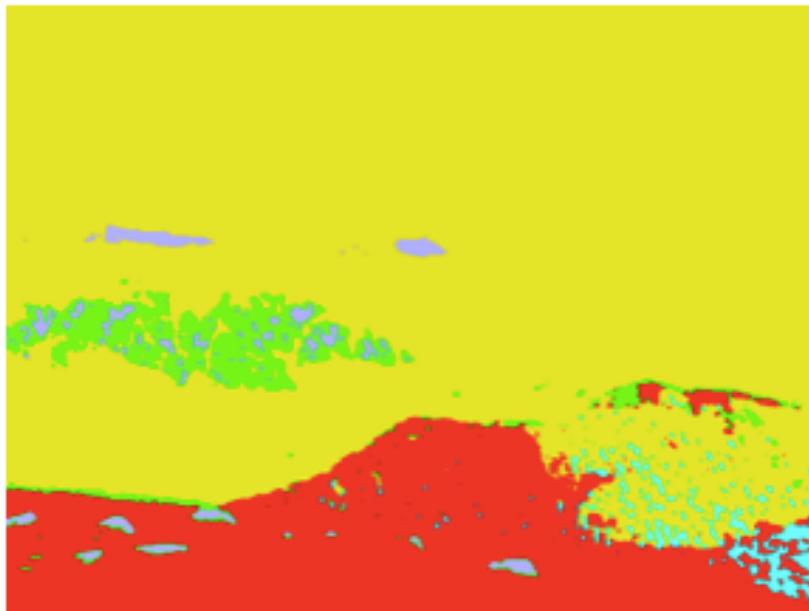
```
imageSegmentation.calculateUsingCIEXYAndClustering(gslImg1, true);
```



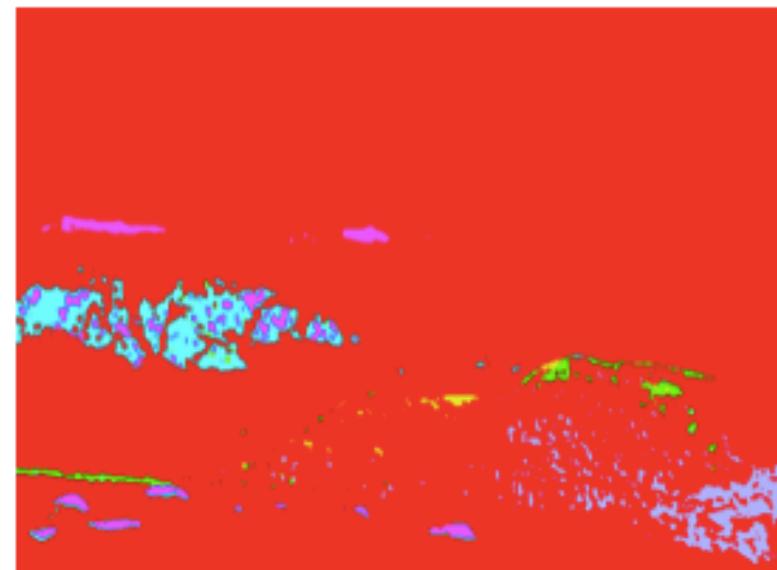
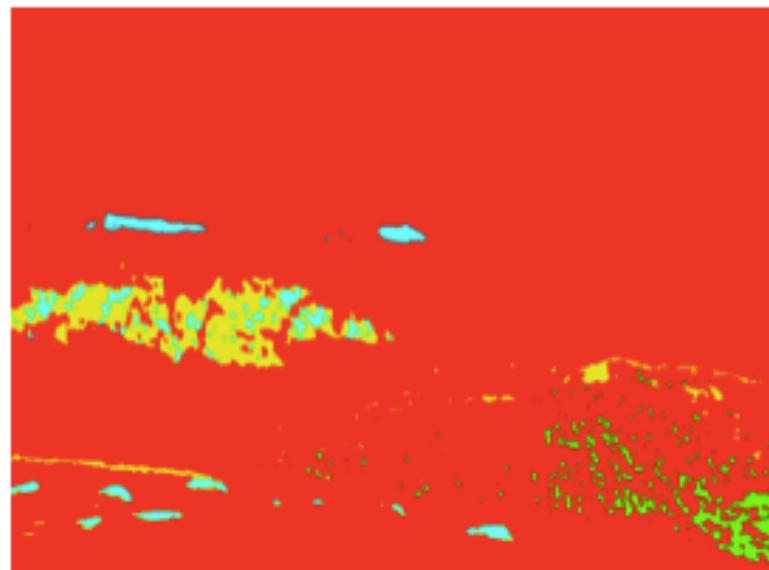
```
imageSegmentation.calculateUsingPolarCIEXYAndClustering(gslImg1, true);
```



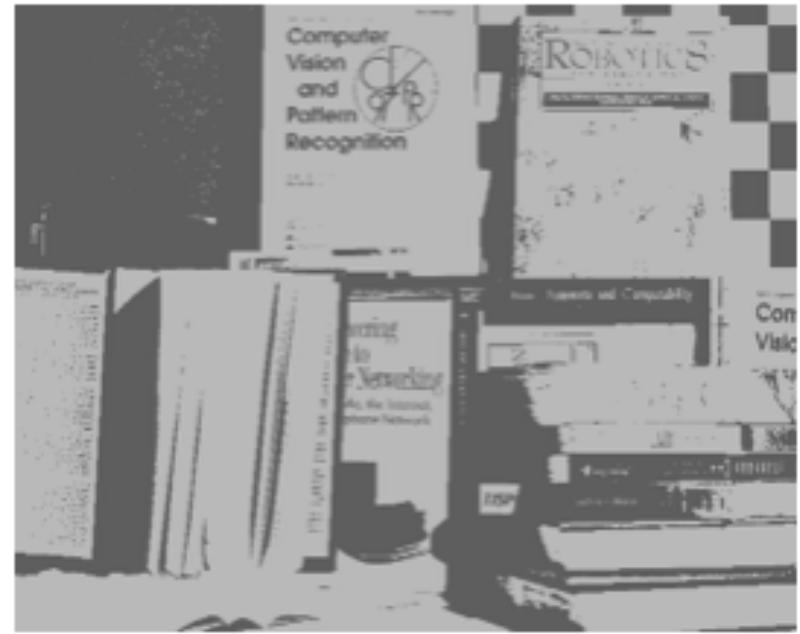
```
imageSegmentation.calculateUsingPolarCIEXYAndFrequency(gslImg1, true);
```



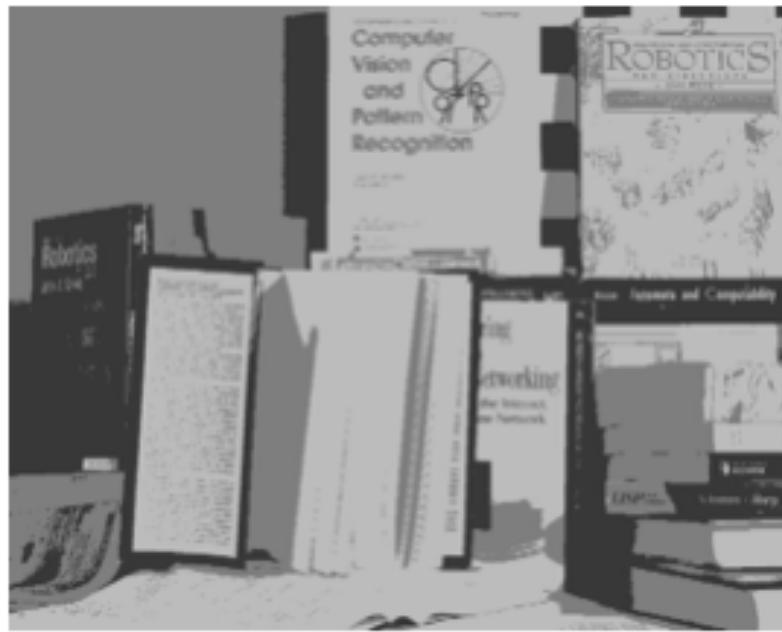
```
imageSegmentation.calculateUsingPolarCIEXYAndFrequency(gslImg1, 0.2f, true);
```



```
int kBands = 2; imageSegmentation.applyUsingKMPP(gslImg1, kBands);
```



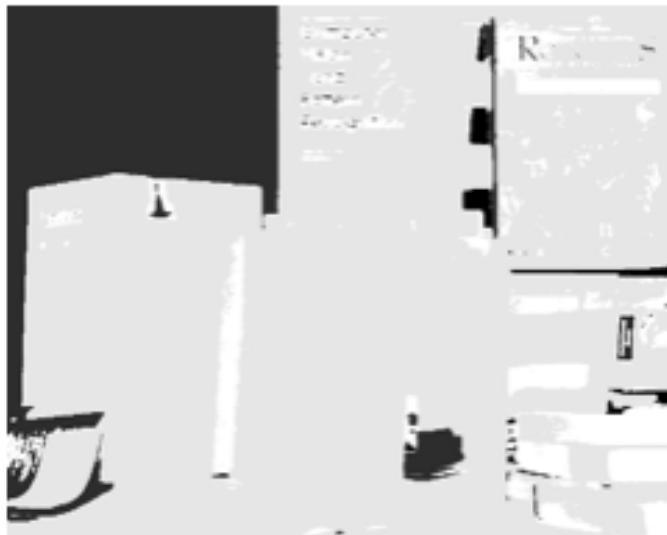
```
int kBands = 3; imageSegmentation.applyUsingKMPP(gslImg1, kBands);
```



```
int kBands = 8; imageSegmentation.applyUsingKMPP(gslmg1, kBands);
```



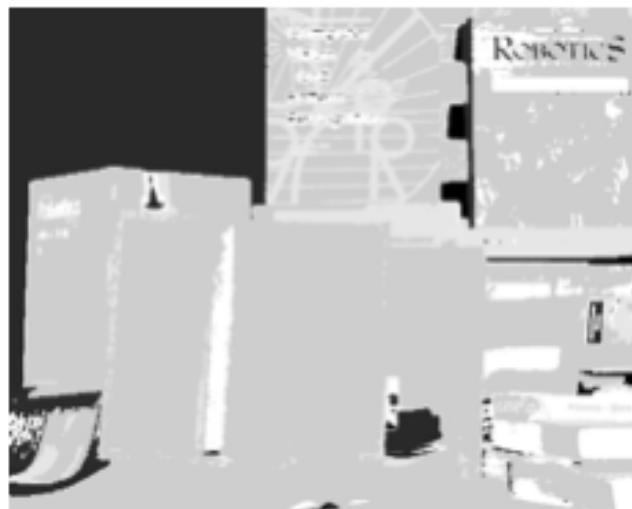
```
int kBands = 2; imageSegmentation.applyUsingCIEXYPolarThetaThenHistEq(gslmg1, kBands);
```



```
int kBands = 3; imageSegmentation.applyUsingCIEXYPolarThetaThenHistEq(gsImg1, kBands);
```



```
int kBands = 8; imageSegmentation.applyUsingCIEXYPolarThetaThenHistEq(gsImg1, kBands);
```



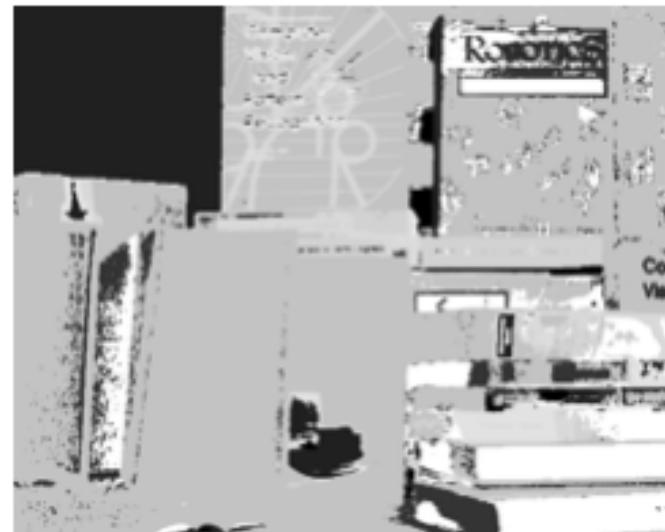
```
int kBands = 2; imageSegmentation.applyUsingCIEXYPolarThetaThenKMPPThenHistEq(gsImg1,  
kBands);
```



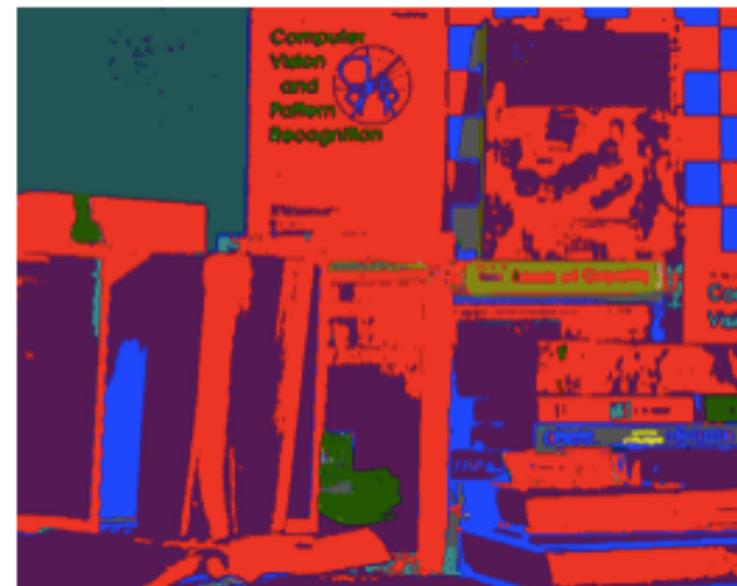
```
int kBands = 3; imageSegmentation.applyUsingCIEXYPolarThetaThenKMPPThenHistEq(gsImg1,  
kBands);
```



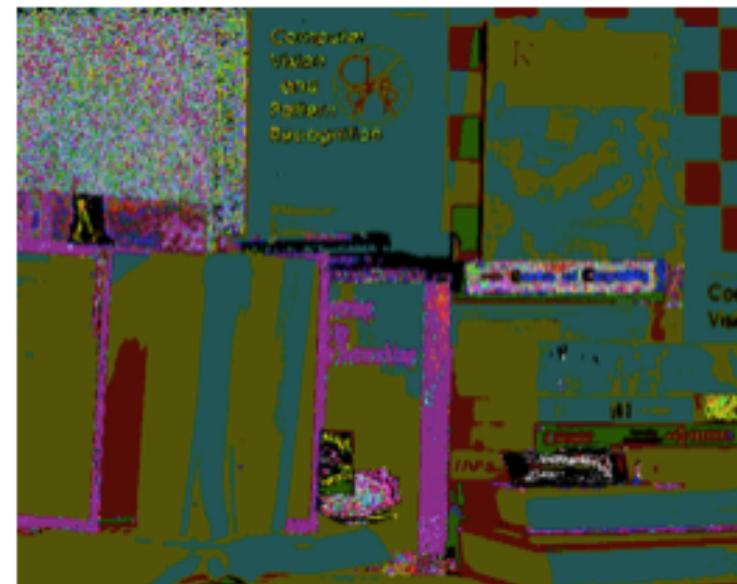
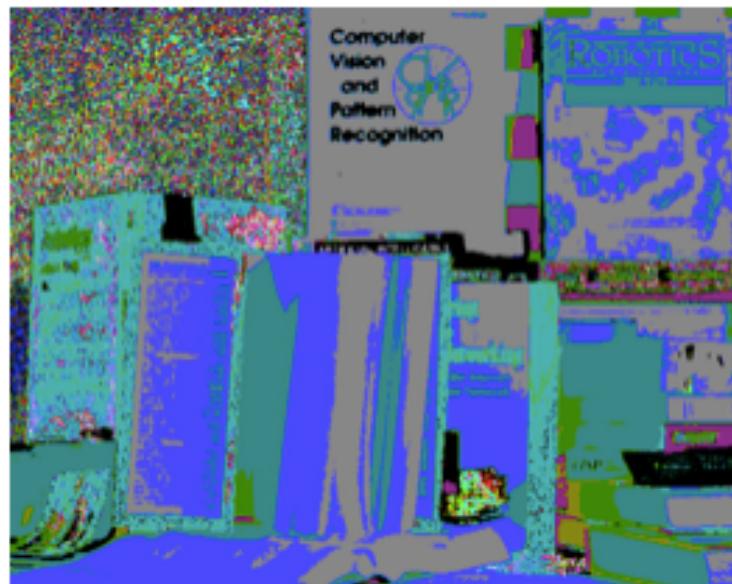
```
int kBands = 8; imageSegmentation.applyUsingCIEXYZPolarThetaThenKMPPThenHistEq(gsImg1,  
kBands);
```



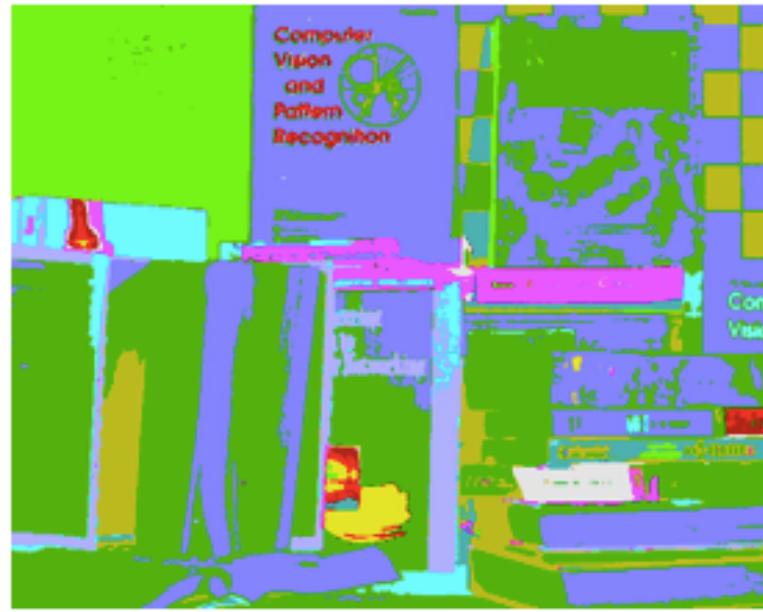
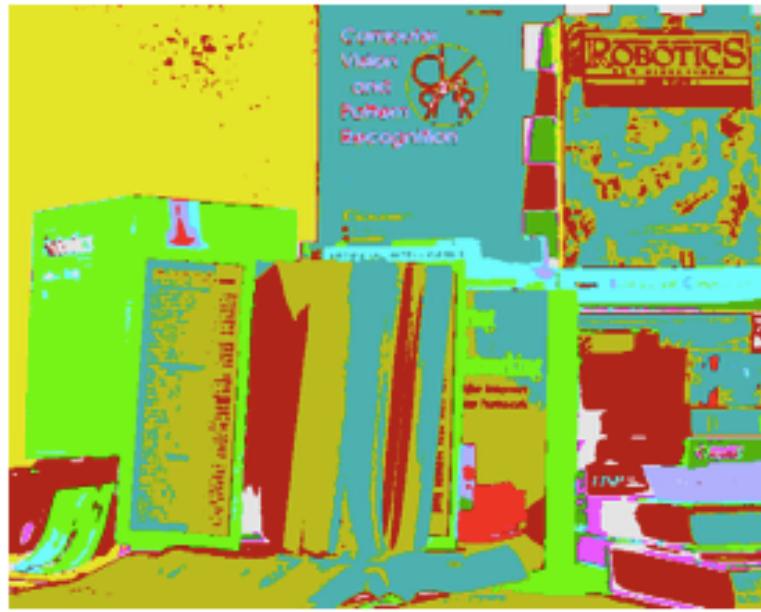
```
imageSegmentation.calculateUsingCIEXYAndClustering(gsImg1, true);
```



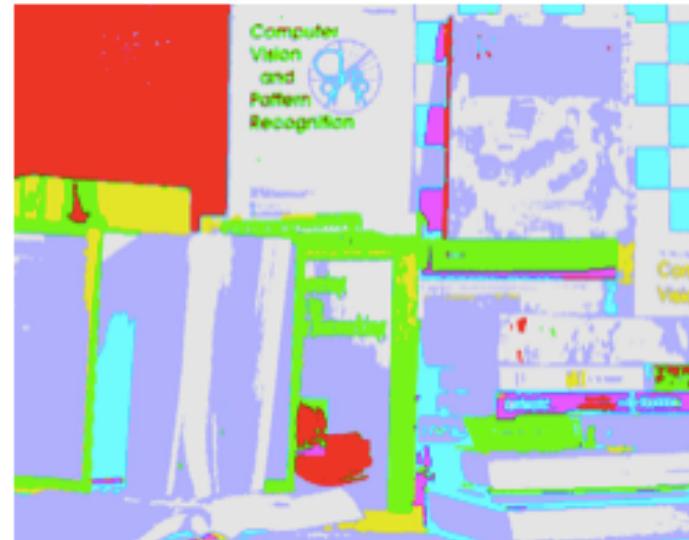
```
imageSegmentation.calculateUsingPolarCIEXYAndClustering(gsImg1, true);
```



```
imageSegmentation.calculateUsingPolarCIEXYAndFrequency(gsImg1, true);
```



```
imageSegmentation.calculateUsingPolarCIEXYAndFrequency(gsImg1, 0.2f, true);
```



```
int kBands = 2; imageSegmentation.applyUsingKMPP(gslImg1, kBands);  
zoom in
```

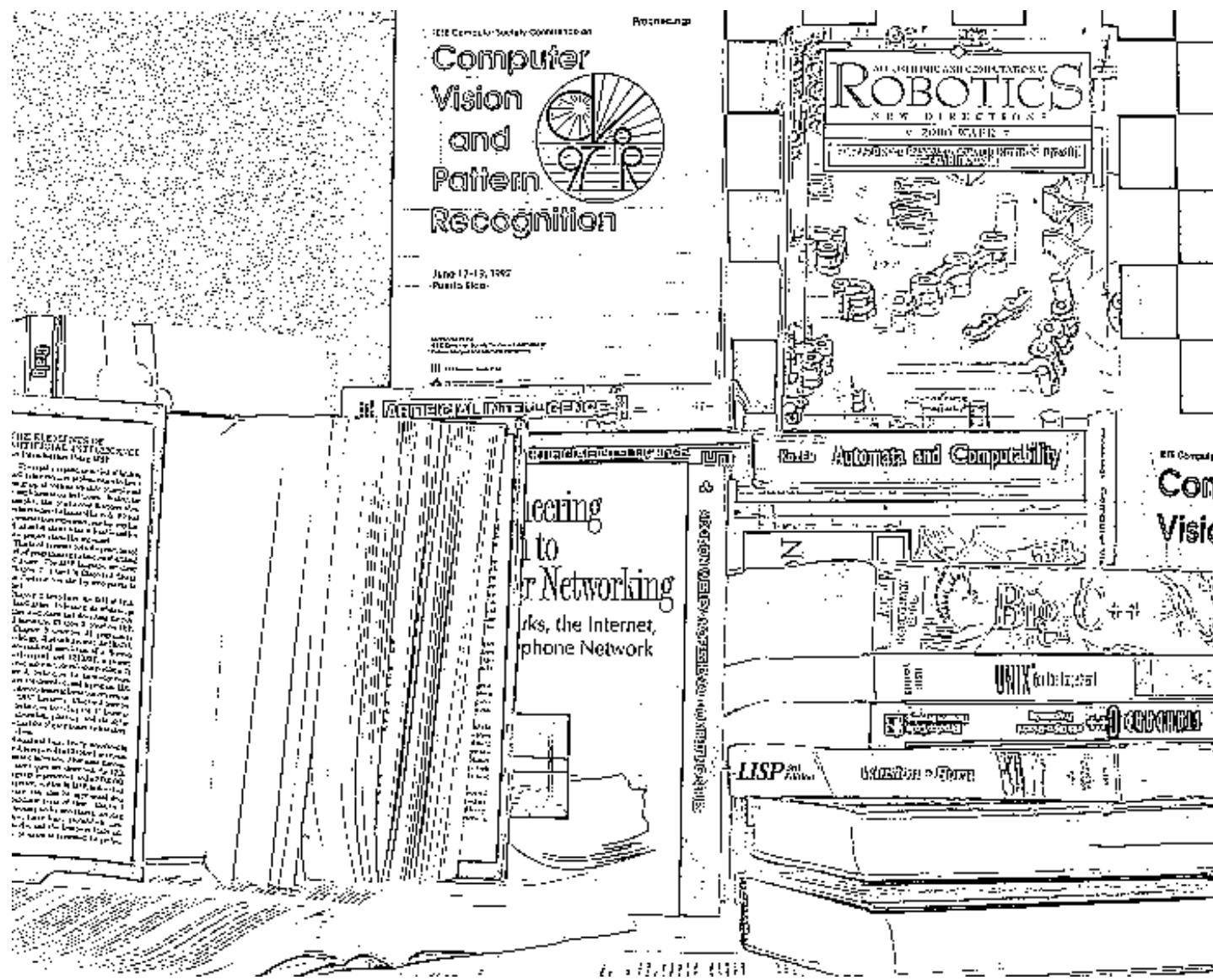
Computer  
Vision  
and  
Pattern  
Recognition



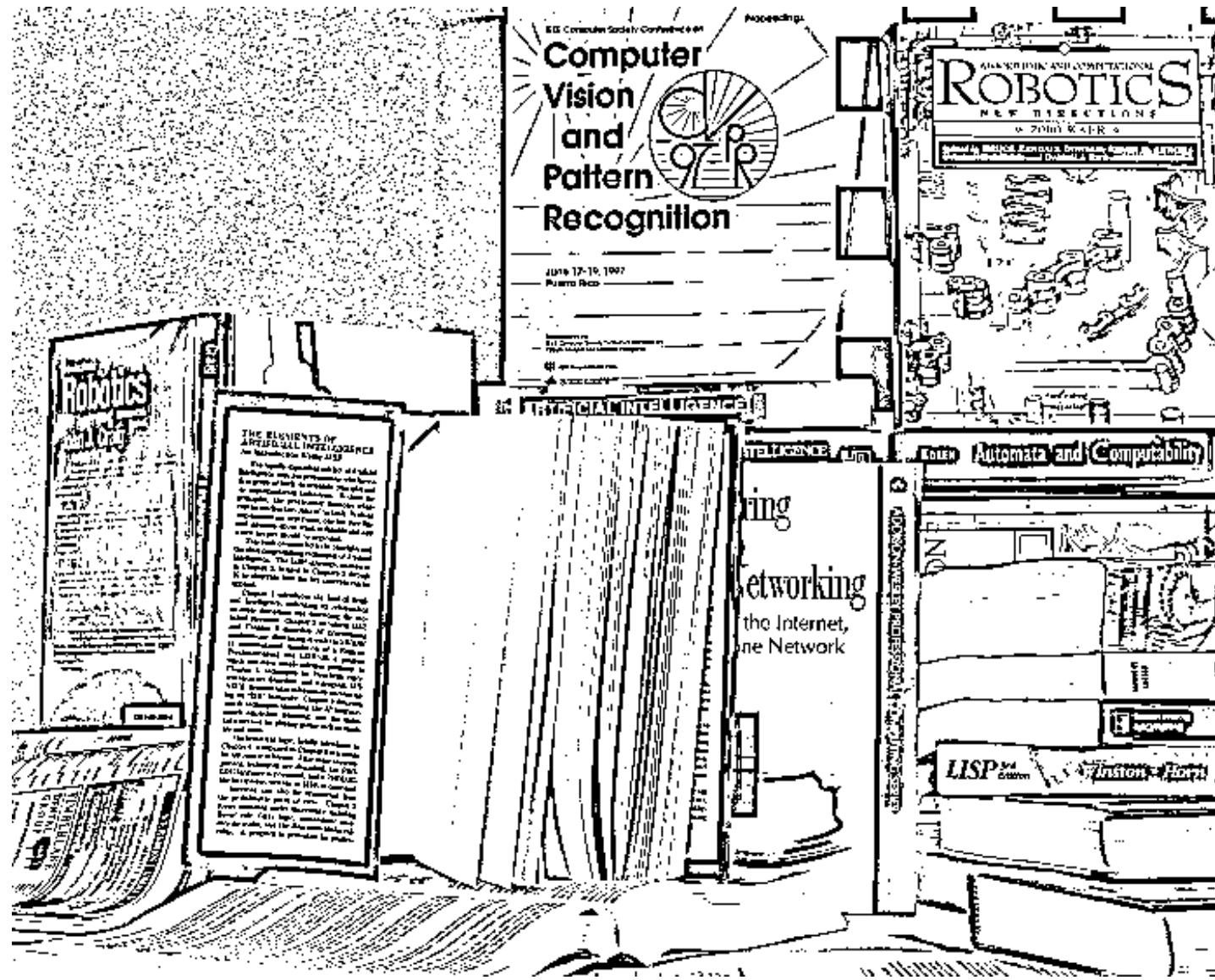
Computer  
Vision  
and  
Pattern  
Recognition



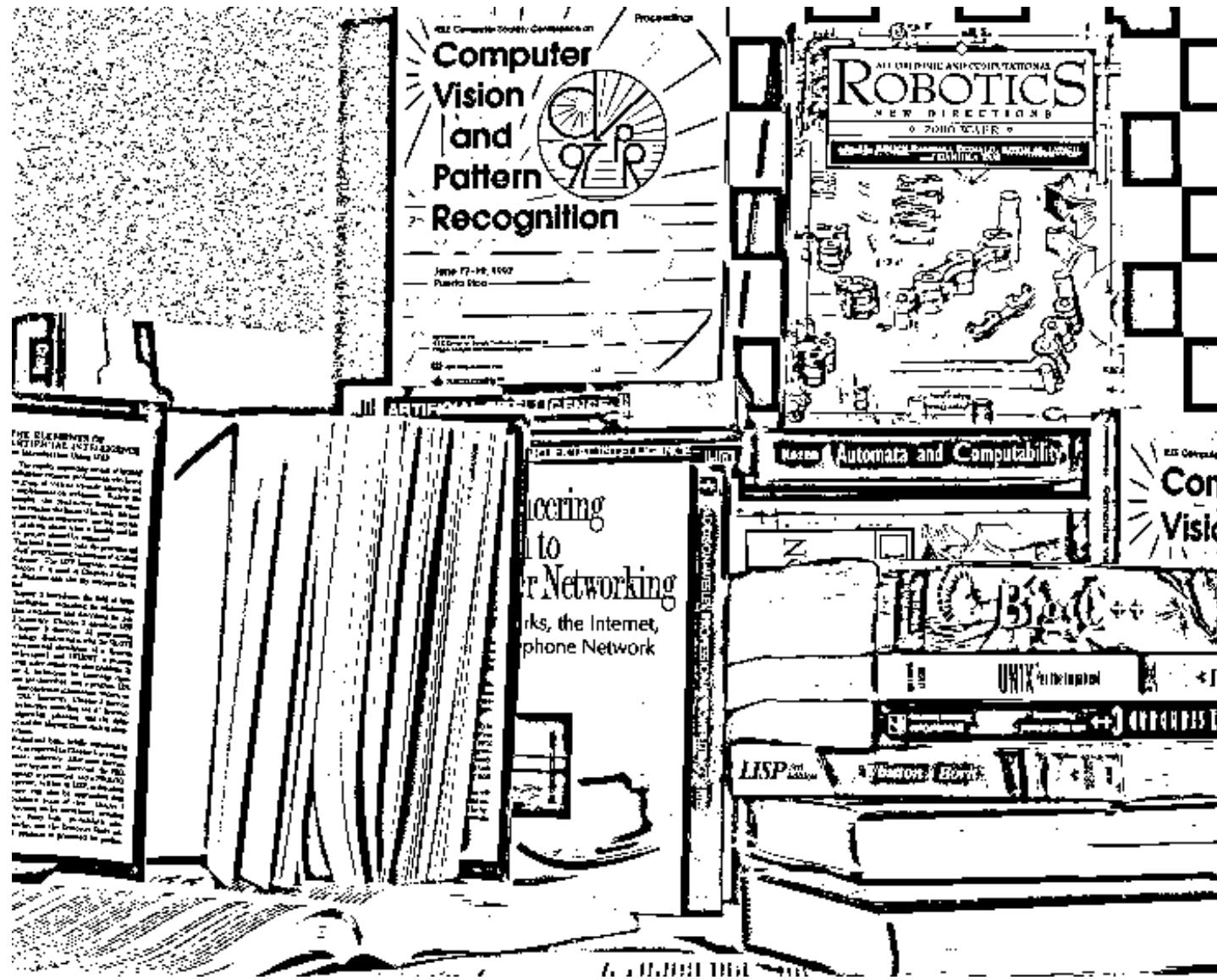
## adaptive means, h=1



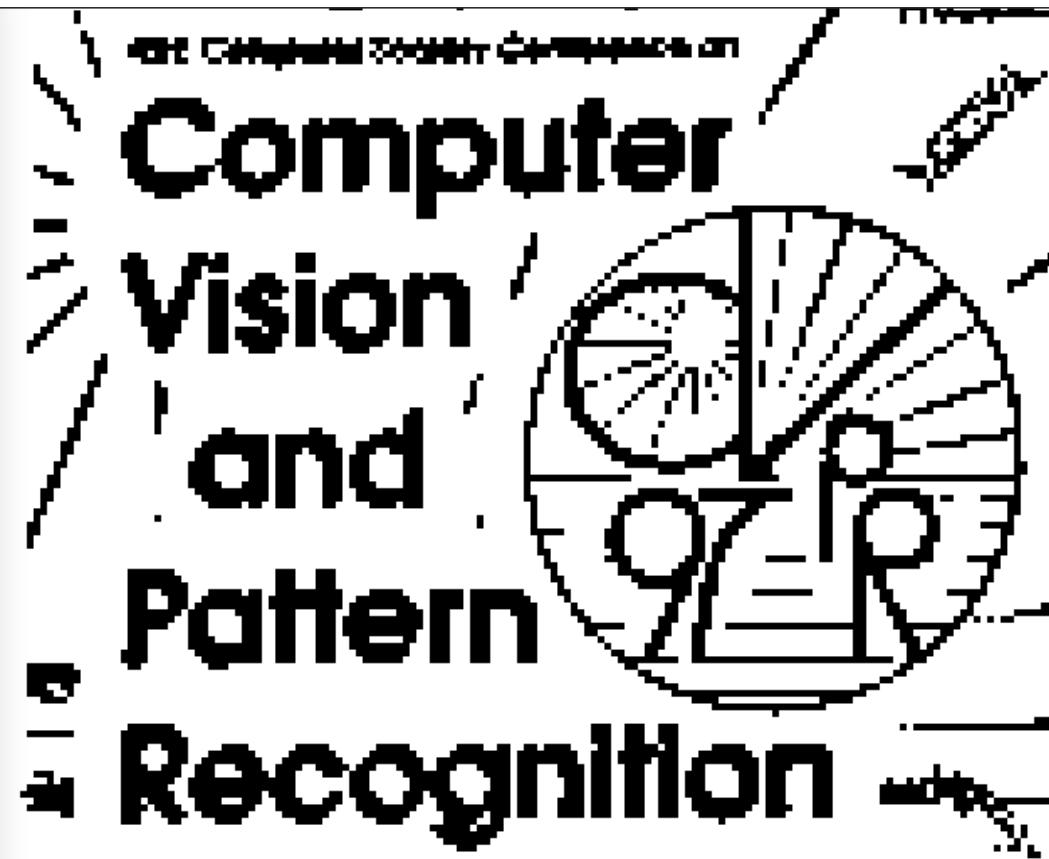
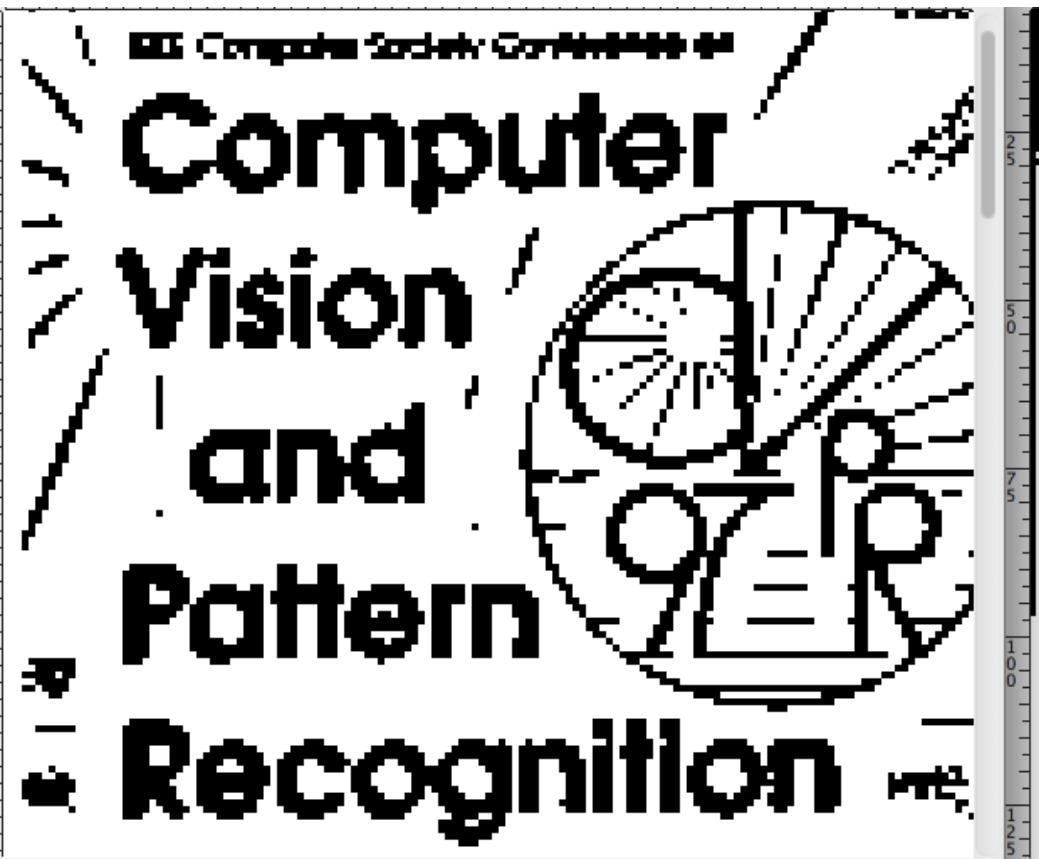
adaptive means, h=3



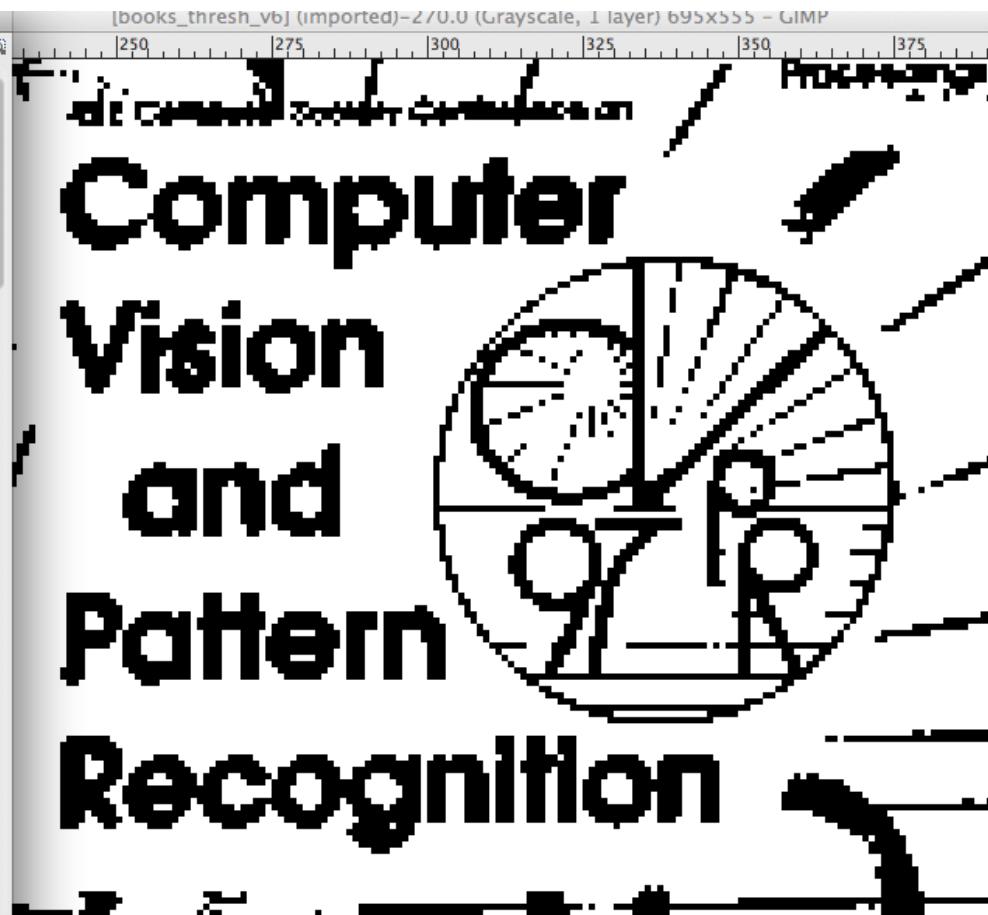
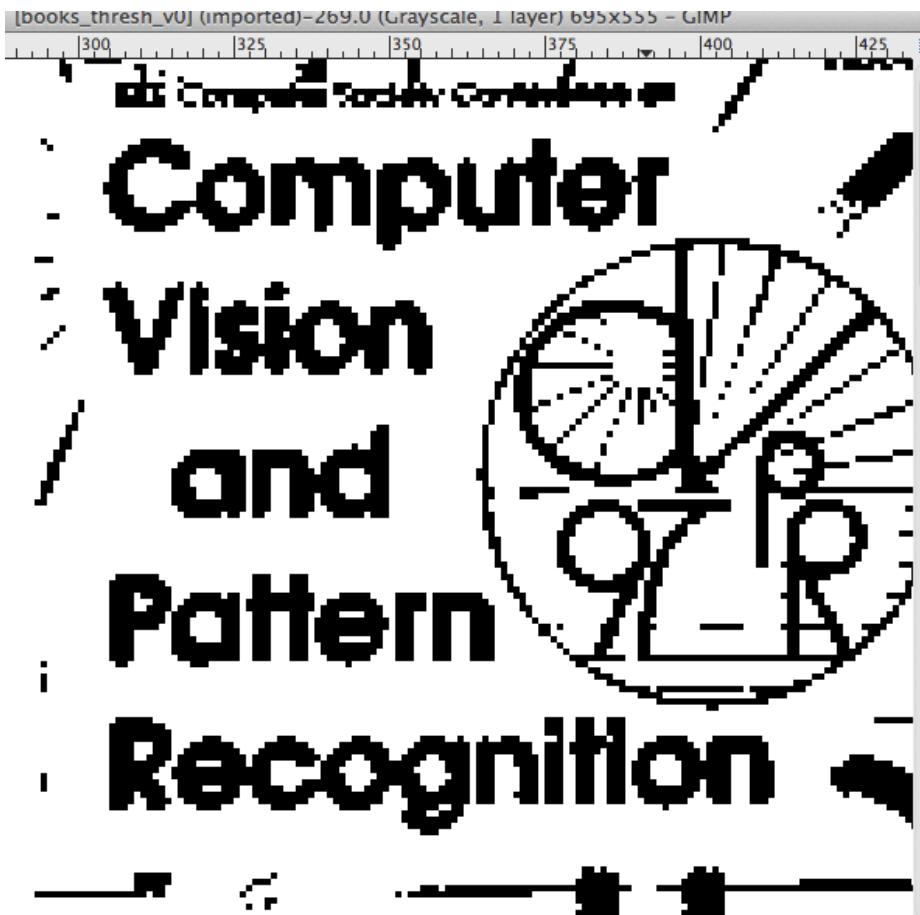
adaptive means, h=5



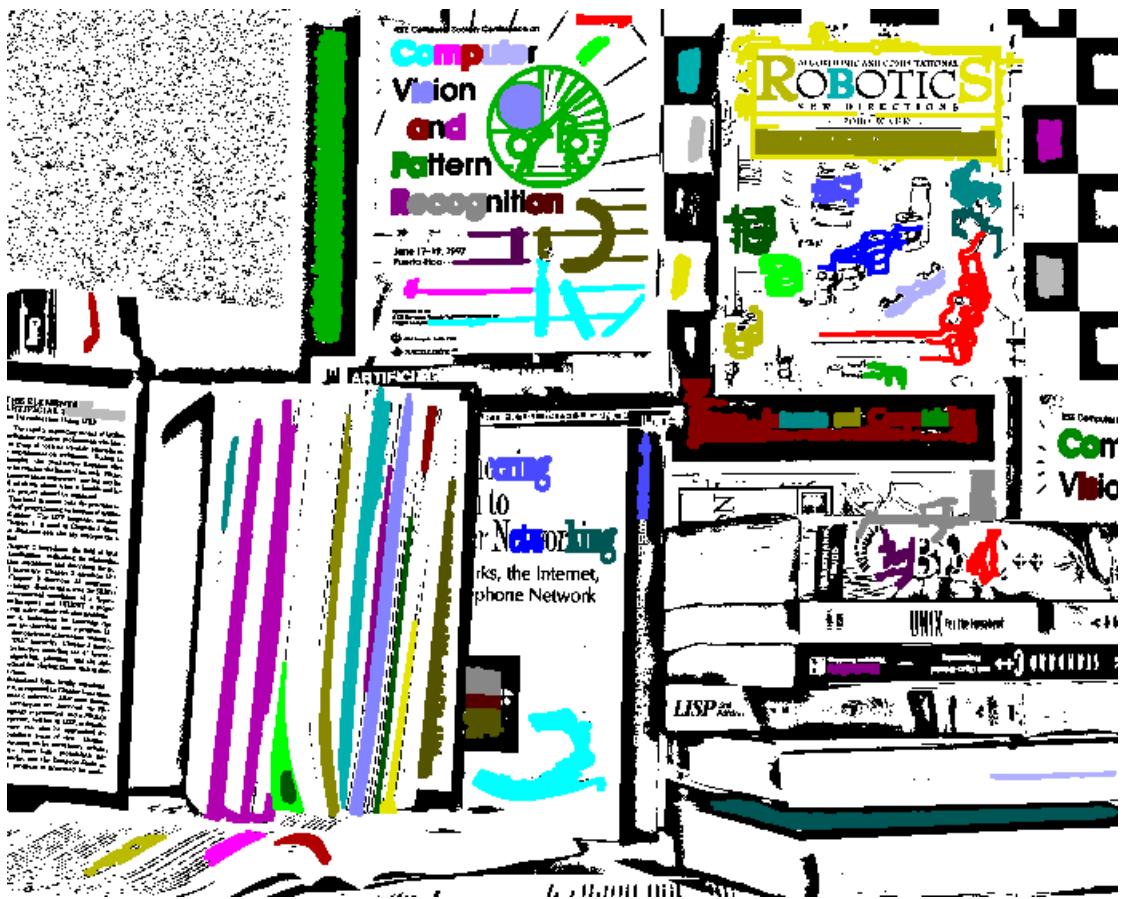
adaptive means,  $h=7$



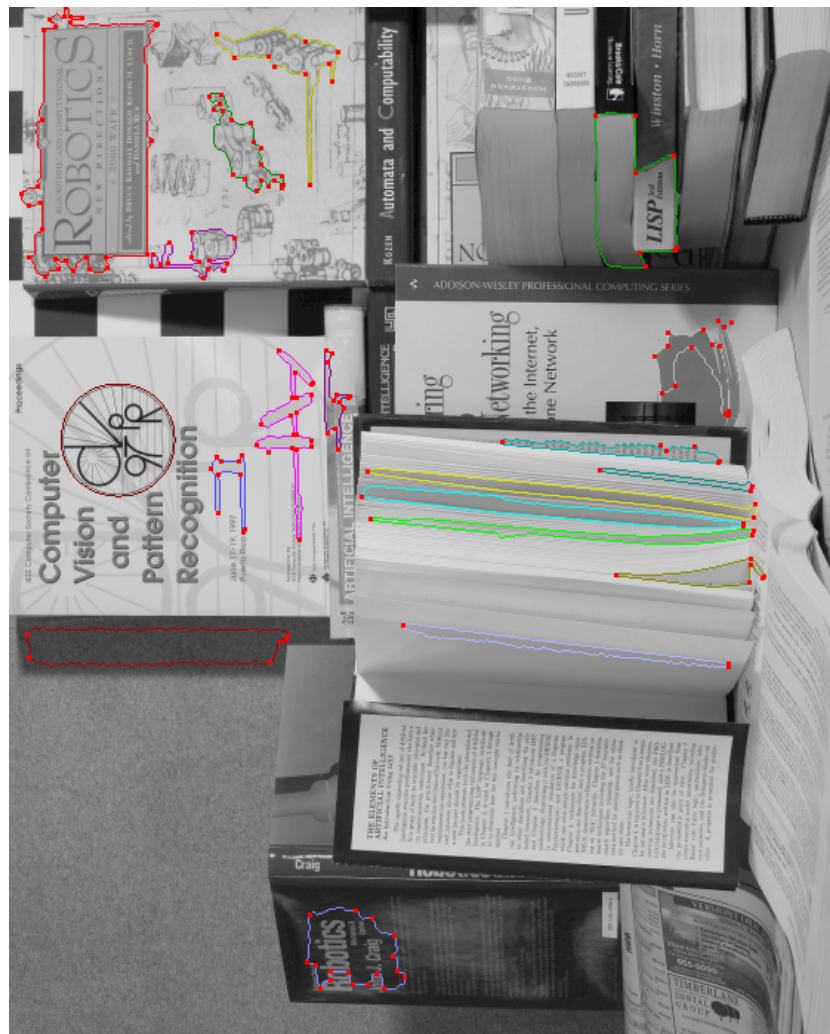
adaptive means, h=11 for adaptive to join close letters



adaptive means, h=11 blobs (extr using scale calc code)

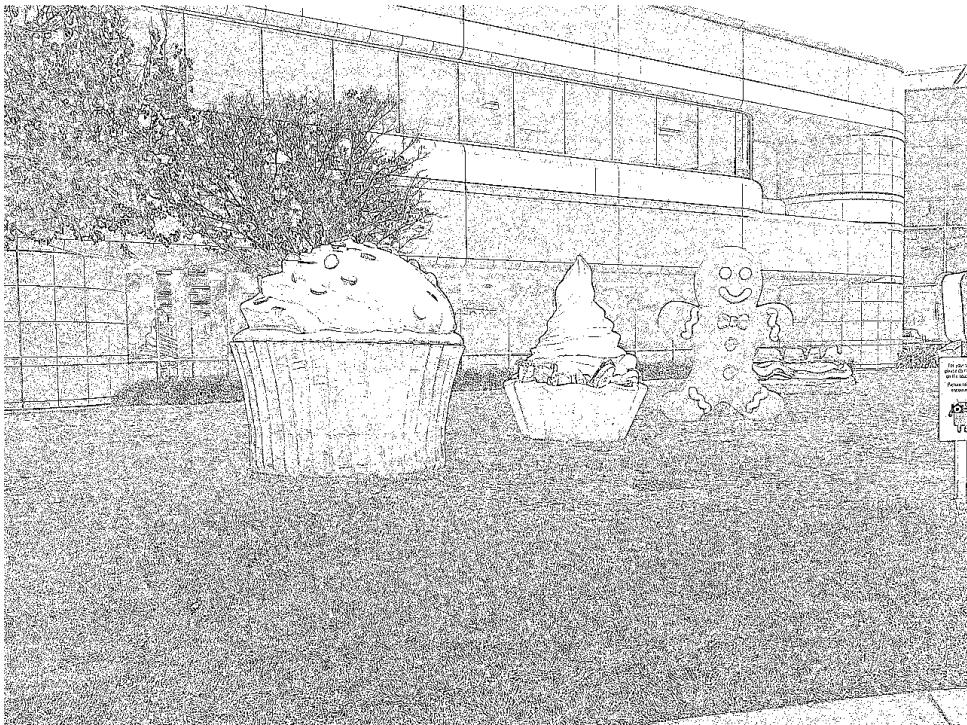


# adaptive means, h=11 blob corners

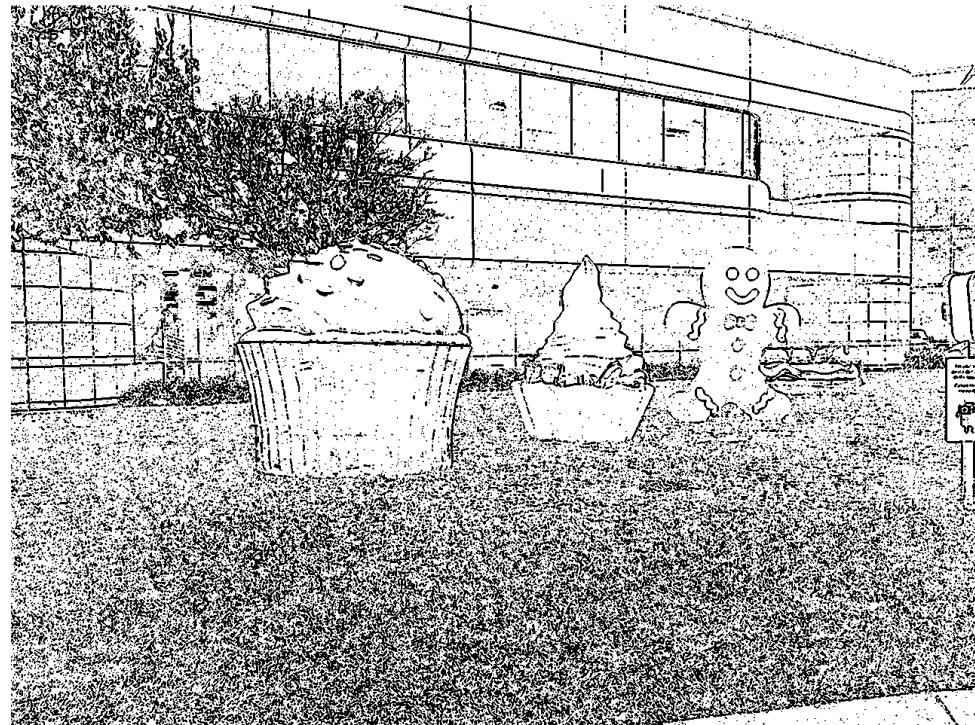


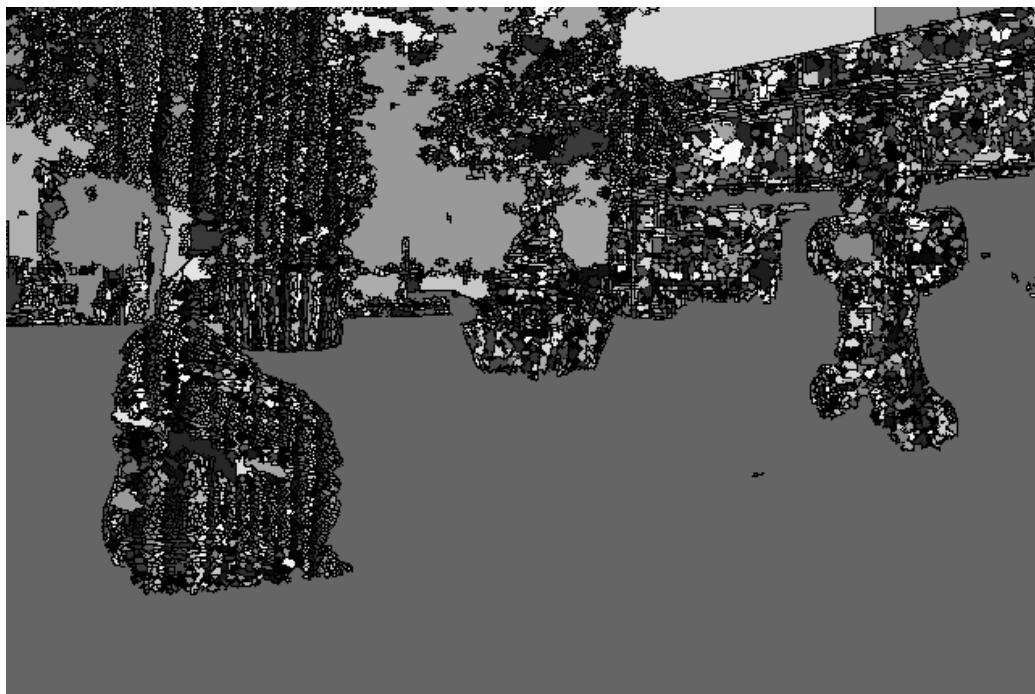
the letters are filtered out due to large nPerimeter compared to nInternal  
adaptive means, h=3 was better for letters as blobs

adaptive means, h=1



two median smooth with h=2





A (from LAB color space) watershed:

very large levels looks like the start of a good mask (excepting for green objects on green background)

<— full size image

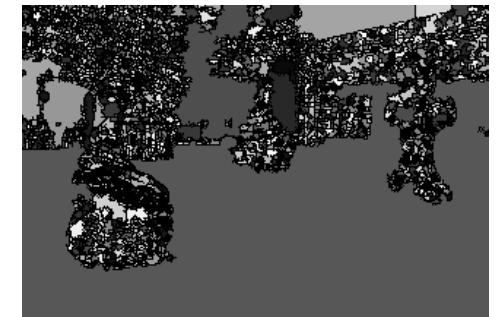
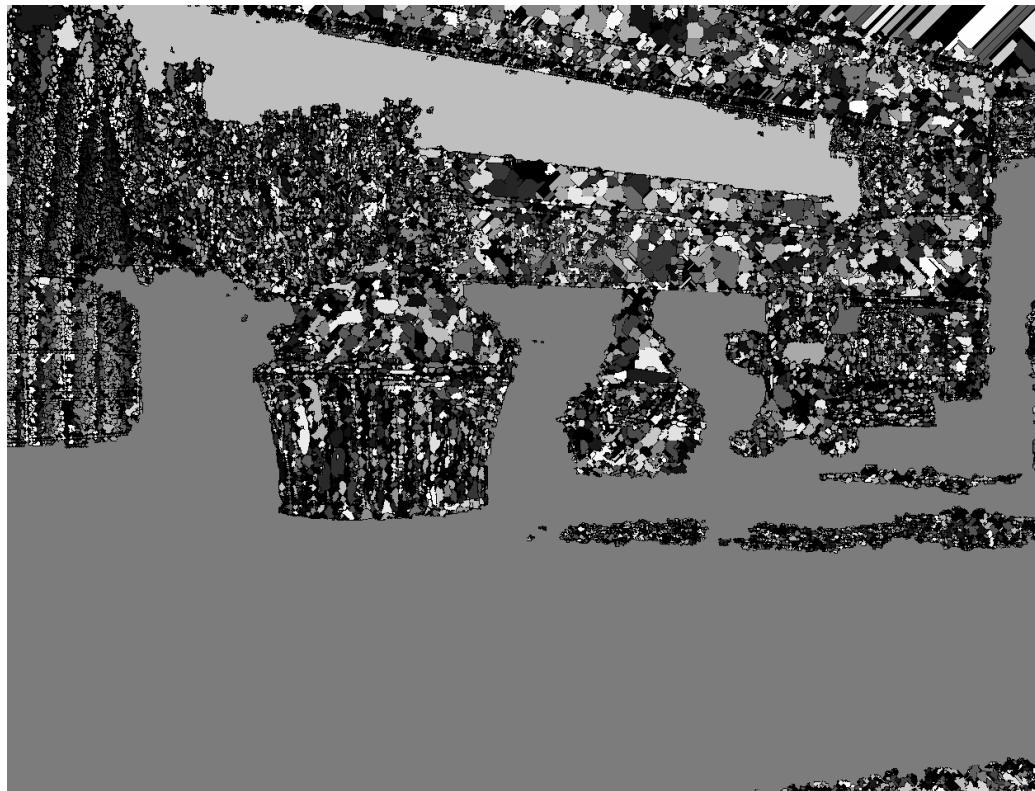


image binned to max  
integer dimension  
350



A (from LAB color space) watershed:

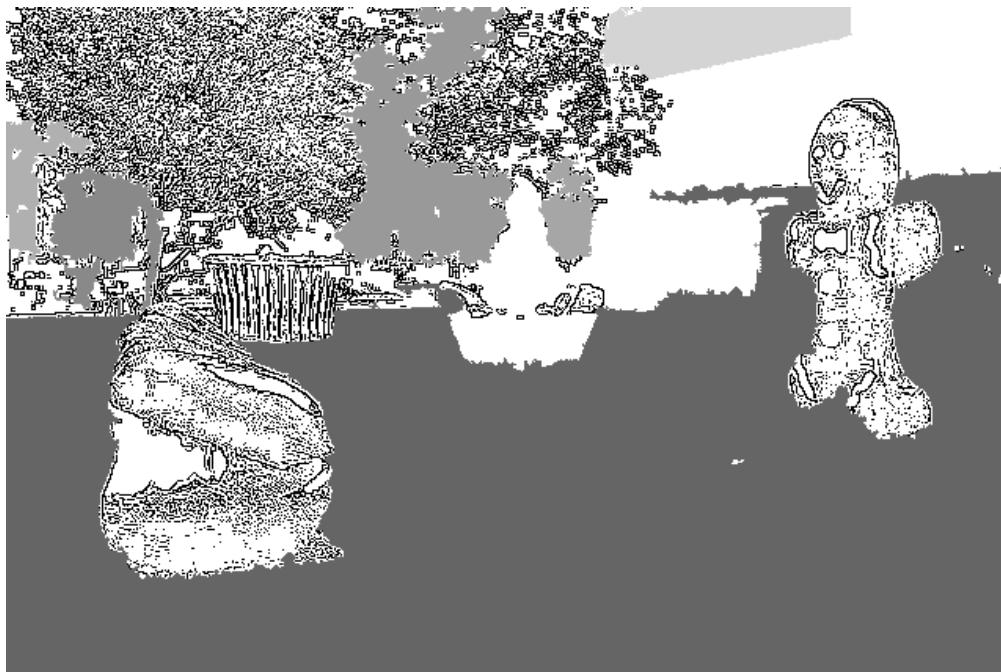
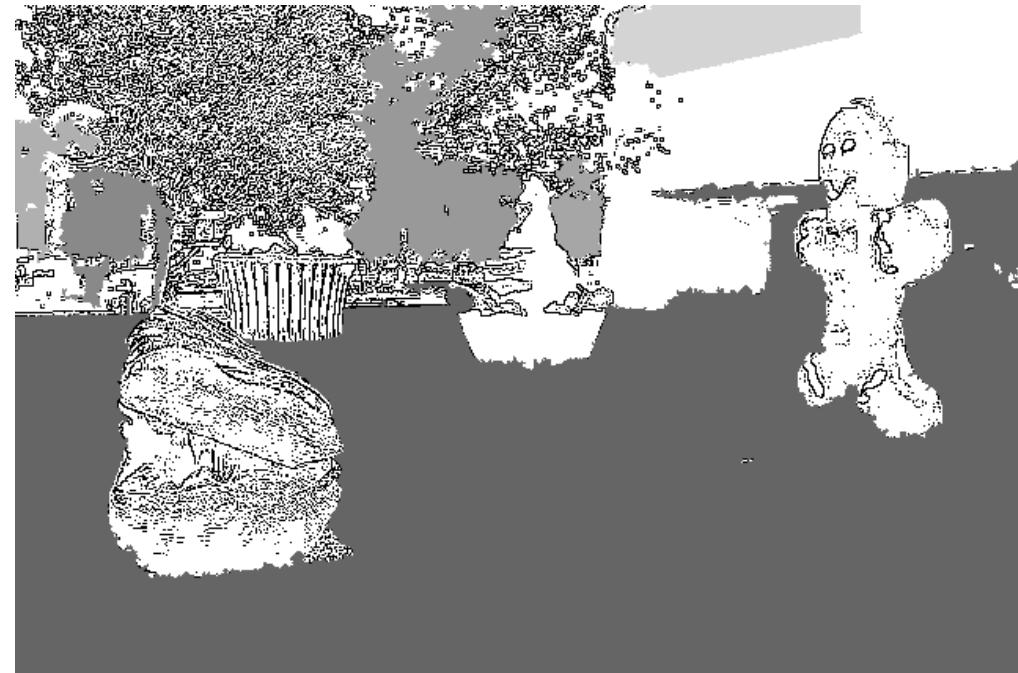
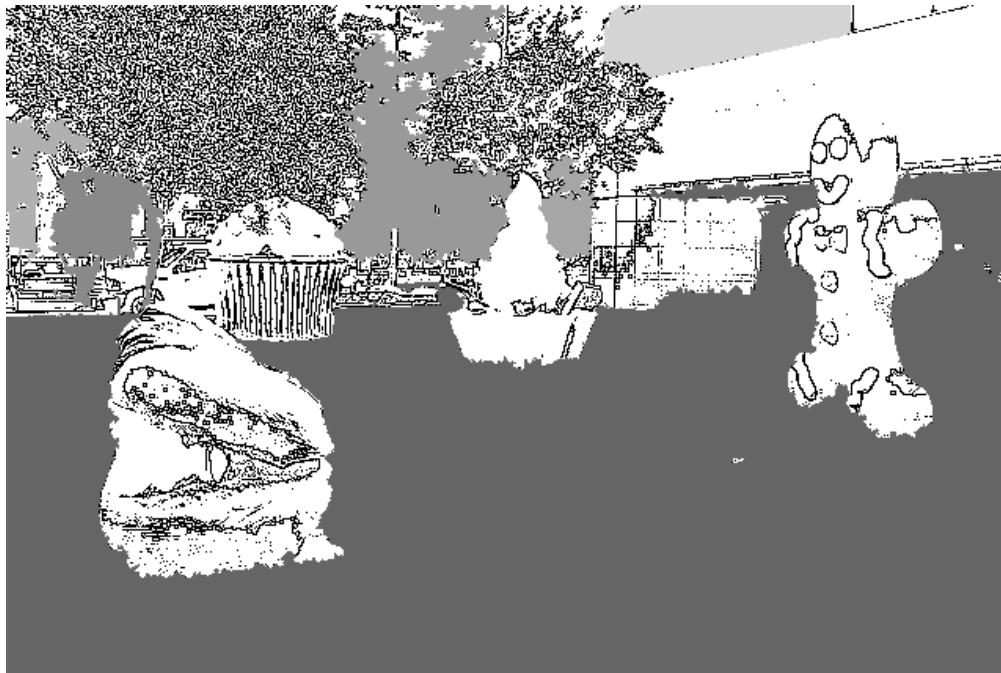
very large levels looks like the start of a good mask (excepting for green objects)

<— full size image



image binned to max  
integer dimension  
350

A watershed large regions as a mask  
then O3 adaptive median or O2 adaptive median.



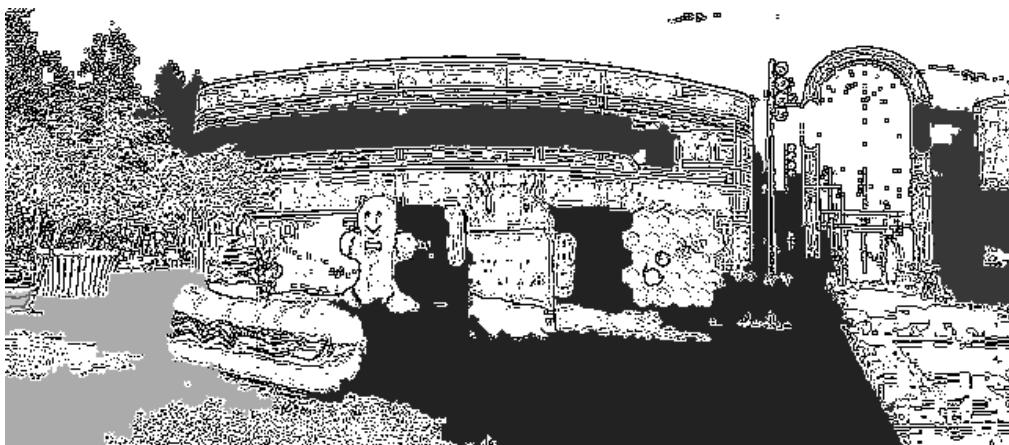
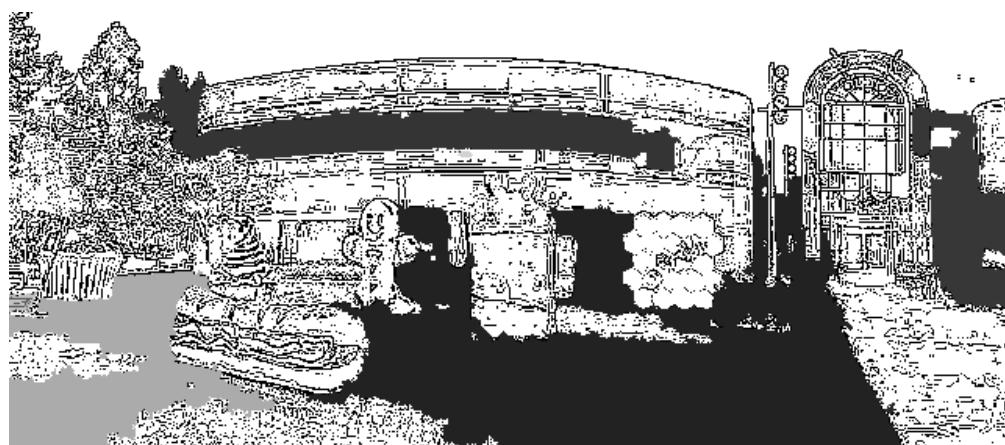
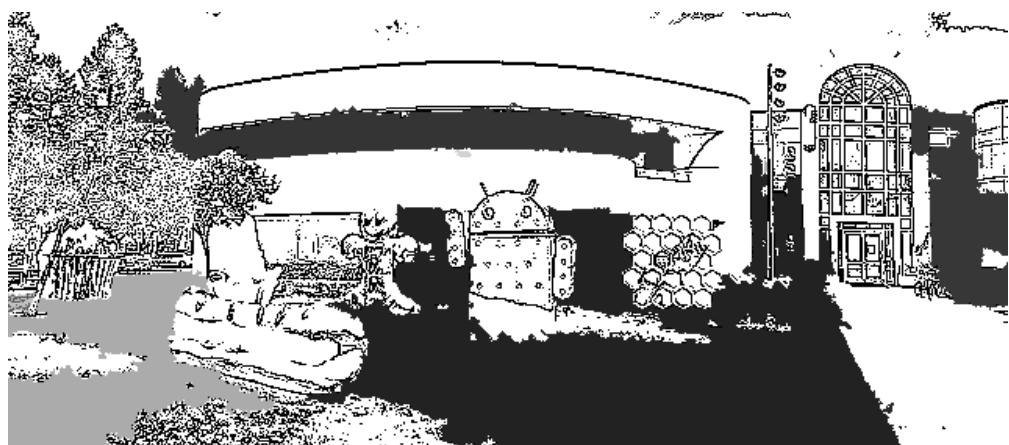
A watershed large regions as a mask  
then O1 adaptive median.

A watershed large regions as a mask  
then O3 adaptive median or O2 adaptive median.



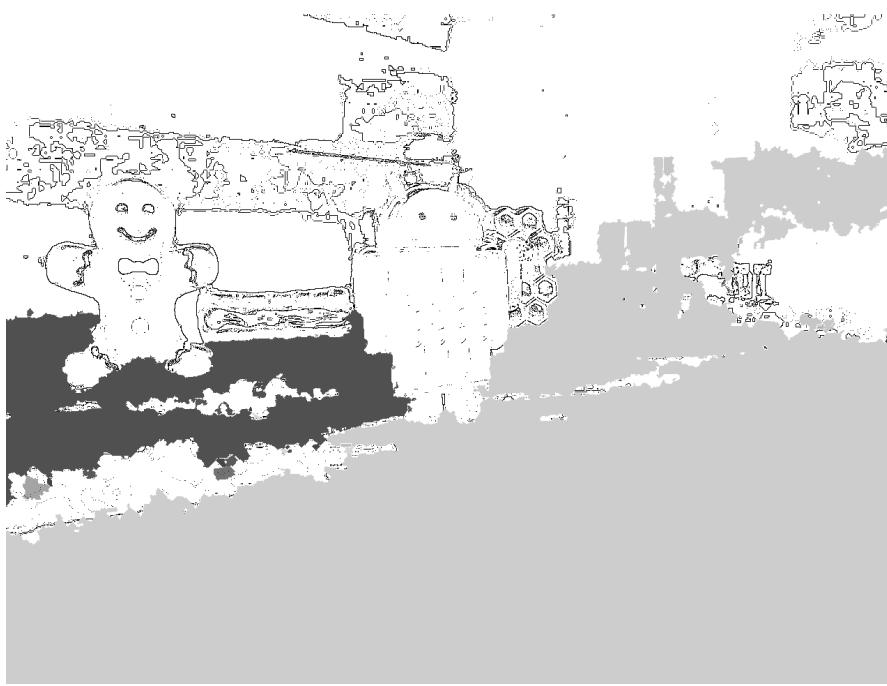
A watershed large regions as a mask  
then O1 adaptive median.

A watershed large regions as a mask  
then O3 adaptive median or O2 adaptive median.

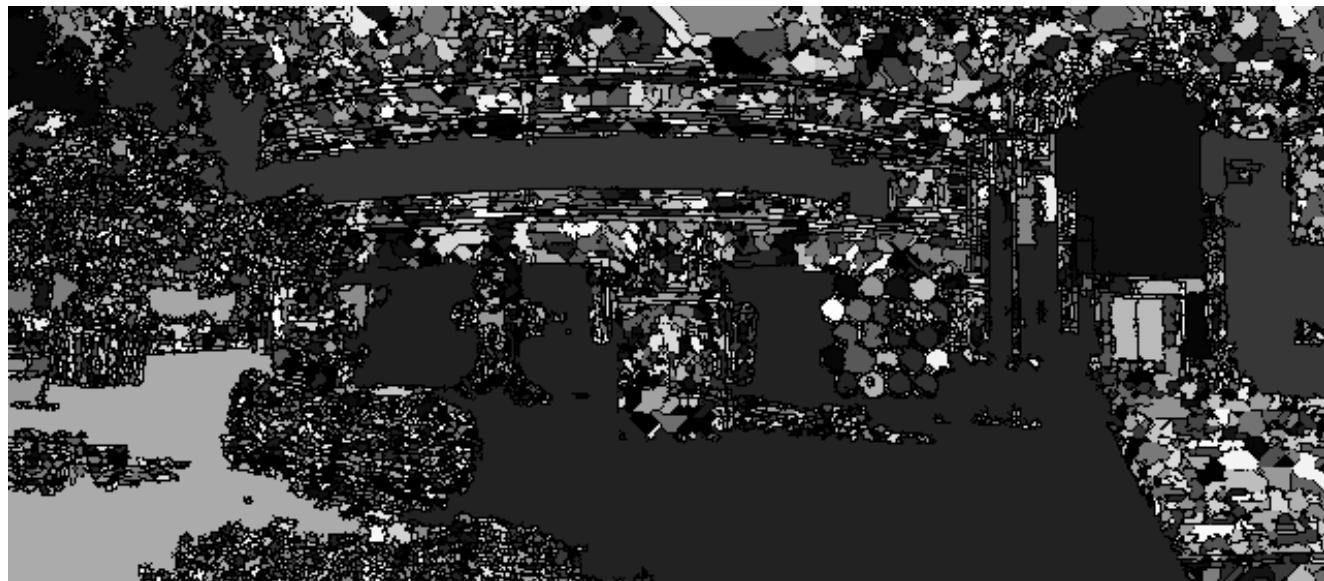


A watershed large regions as a mask  
then O1 adaptive median.

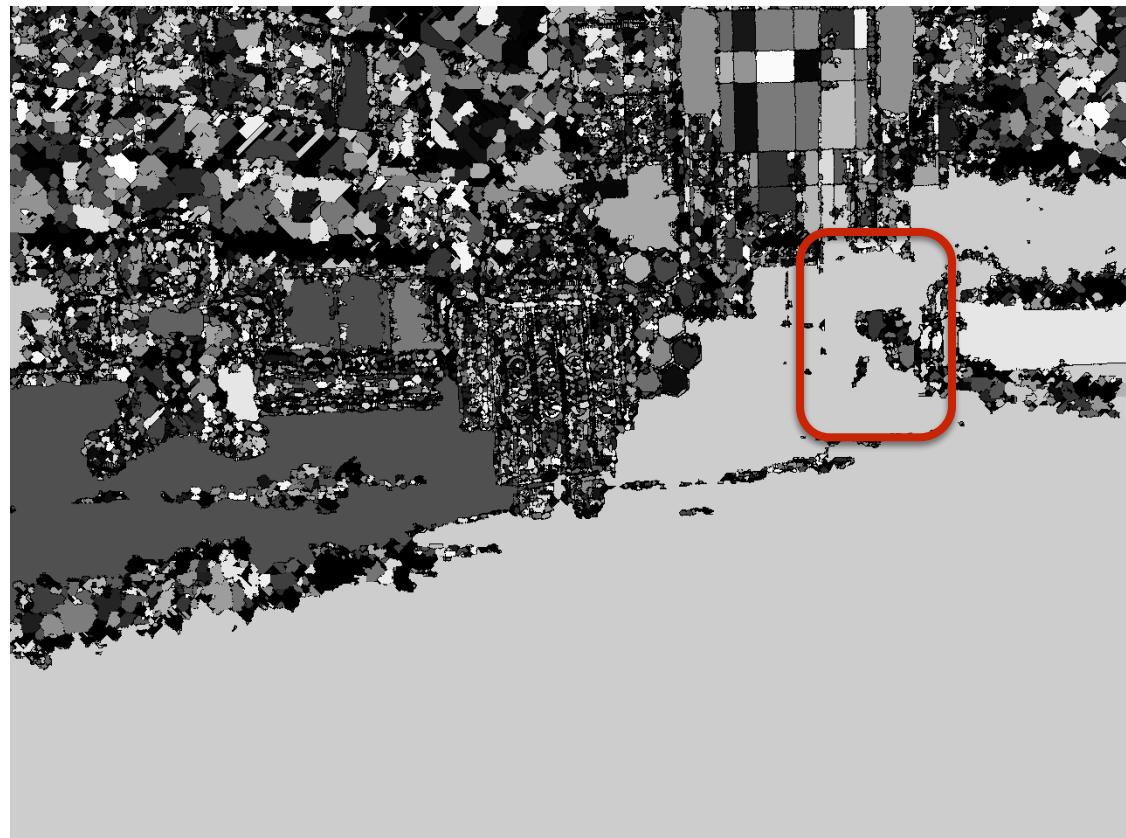
A watershed large regions as a mask  
then O3 adaptive median or O2 adaptive median.



A watershed large regions as a mask  
then O1 adaptive median.



A (from LAB color space)  
watershed:



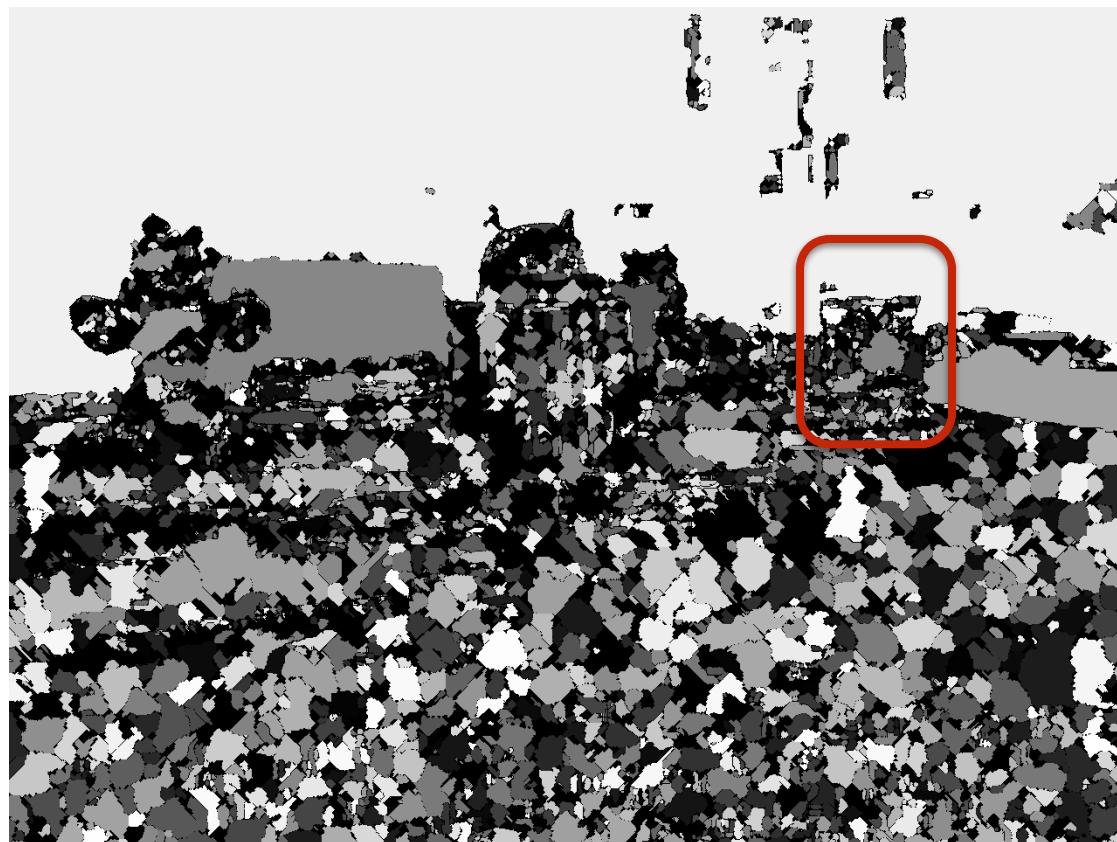
A (from LAB color space) watershed:

part of green droid is lost in grass watershed





O2 watershed:



O2 watershed:



