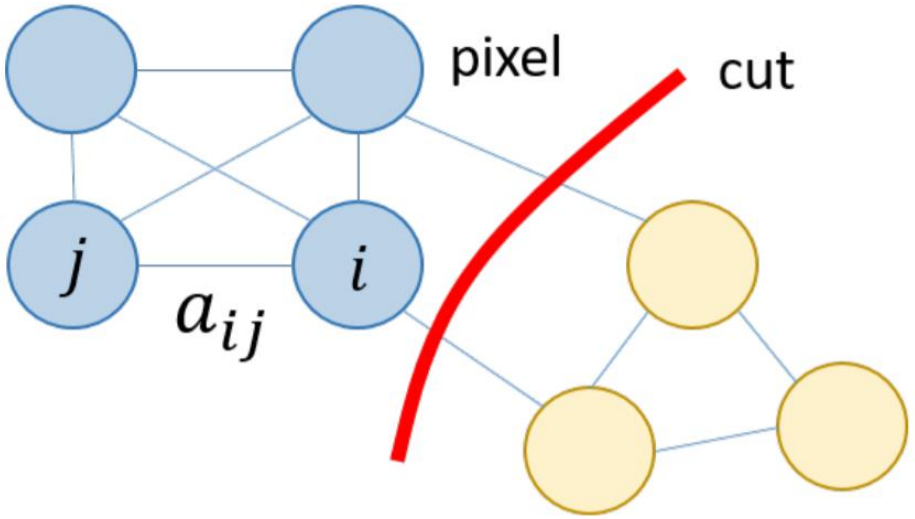
ISPR

MIDTERM 1

ASSIGNMENT N.4: IMAGE SEGMENTATION VIA NORMALIZED CUT



Bisconti Elia 518630 e.bisconti@studenti.unipi.it

THE PROCESS

IMAGE → SUPERPIXEL SEGMENTATION → REGION ADJACENCY GRAPH → NCUT SEGMENTATION

```
def myNCut(img, c, n):

    labels1 = segmentation.slic(img, compactness=c, n_segments=n)
    out1 = color.label2rgb(labels1, img, kind='avg')

    g = graph.rag_mean_color(img, labels1, mode='similarity')

    labels2 = graph.cut_normalized(labels1, g)
    out2 = color.label2rgb(labels2, img, kind='avg')


    return out1, out2, len(np.unique(labels1))
```

- compactness : higher value makes superpixel shapes more square/cubic (0.1, 1, 10, 100).
- n_segments : approximate number of labels in the segmented output image. (100, 200, 400, 800)

RESULTS

Original Image

Slic nseg: 162

N Cut

Slic nseg: 540

N Cut

K-MEANS VS NCUT COMPARISON

Original Image

N Cut

Kmeans K=3

Kmeans K=9

CONCLUSIONS AND REMARKS

- Different oversegmentation method can lead to different results.
- SLIC is a good solution to obtain superpixels
  - avoids several redundant distance calculations.
  - tuning the parameters is essential
- NCut produces a better segmentation compared to a kmeans approach.

repo: https://github.com/eliabisconti/ispr-ncut.git