CV2015Spring—Assignment #3

Liu Xiaoyang

June 21, 2015

1. Grab Cut

Step1&2 Input image and use image signature

Figure1: Input Image

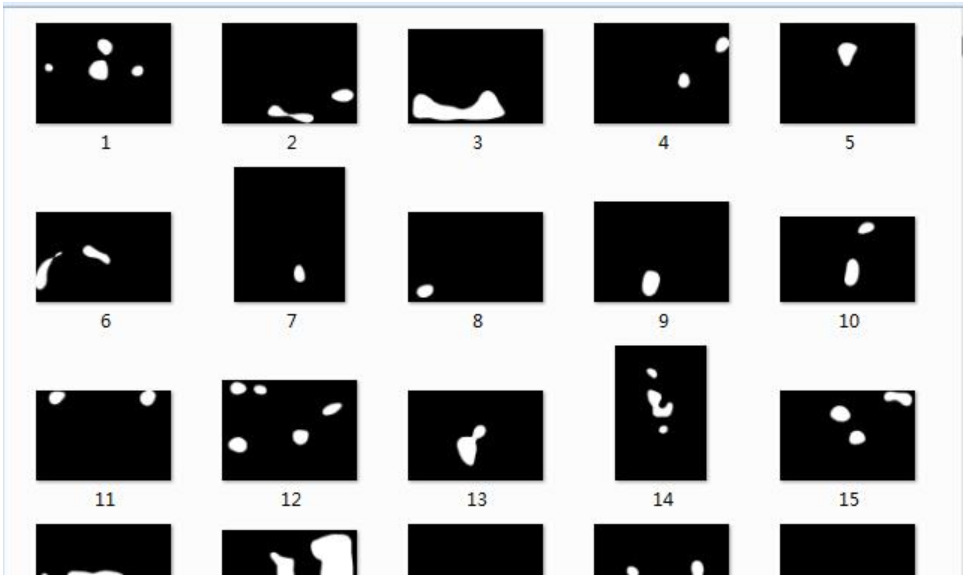

Figure2: Output Image(thresholds=0.7)

In this step, I use the dataset PASCAL and I input all images by batch

processing. The saliency map is obtained by image signature and the matlab code of “signatureSal” can be downloaded from website. A file to save the saliency maps is necessary.

Step3&4 Draw the Rectangle&Implement Grab Cut

I use opencv to implement this step. Firstly, a for loop is used to process images of seven thresholds (0.2 to 0.8) and two strings are used to store the path of origin images and saliency maps. Secondly, the function GetListFiles of class Directory is used to get all the images that stored in these paths and store their information in two string vectors. Thirdly, a for loop is used to process images of each threshold with the times of iterations from 3 to 6. Finally, I use the program which is given to proceed Grab Cut. The C++ code for drawing rectangle and implementing grab cut can be downloaded from the website.

Figure3: Segmentation Image

Step5 Evaluate segmentation result

In this step, the evaluation code is implemented in MATLAB. I

generate a matrix to store the evaluation index of each threshold and two for loops to compute these indexes. After that, the prfCount() is used to computer three indexes of each image and add them into the matrix. Finally, adjust threshold to obtain different segmentation results and draw a bar graph to evaluate grab cut. The evaluation graph are shown in Figure 3-6.

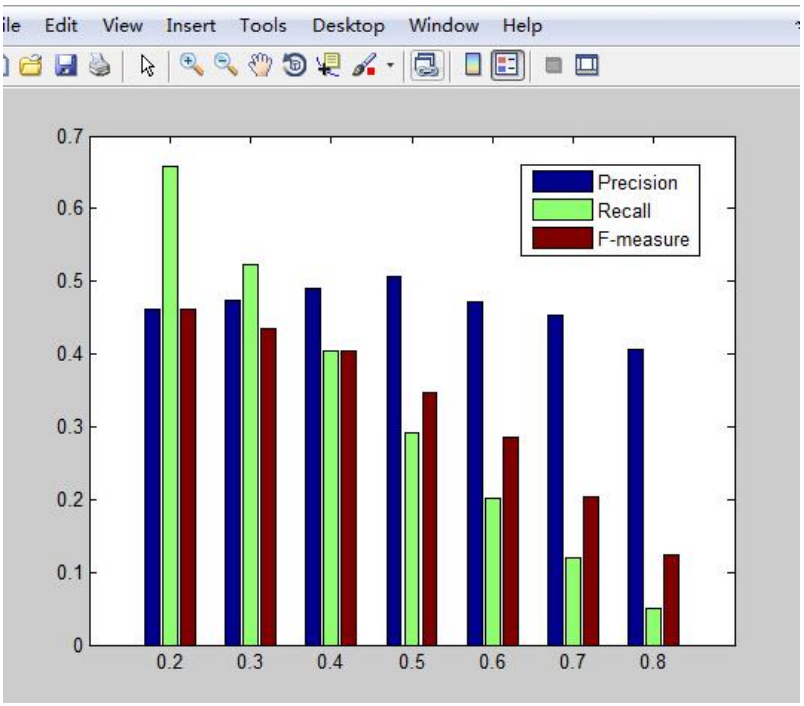

Figure4: PRF bar graph when times of iteration is 3

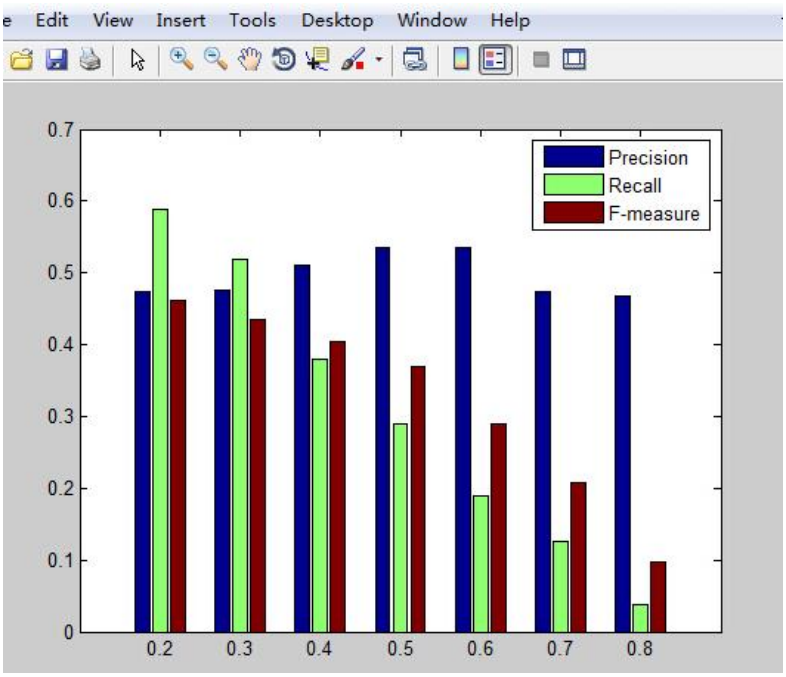

Figure5: PRF bar graph when times of iteration is 4

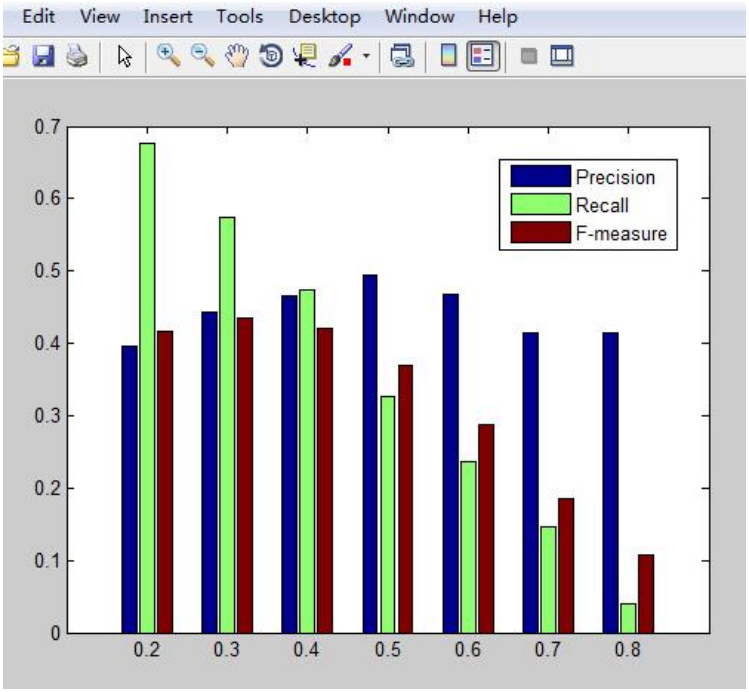

Figure6: PRF bar graph when times of iteration is 5

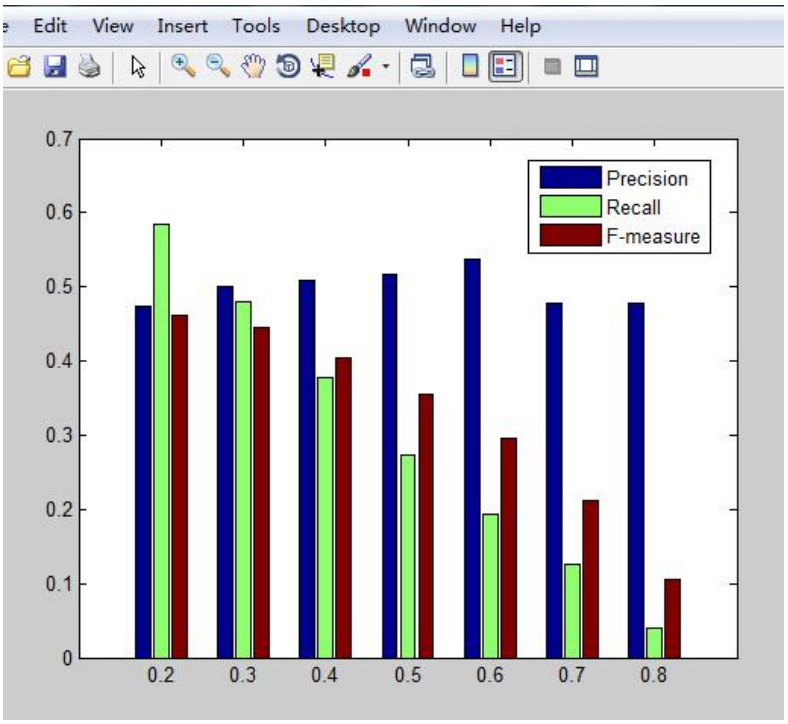

Figure7: PRF bar graph when times of iteration is 6

Evaluation:

The larger index means better result. From the charts we can get the conclusion that if we enlarge the times of iteration, we can get better segmentation. And when the threshold is set 0.2 or 0.3, we will get the best segmentation, and if we increase the threshold the result will become worse.

2. Mean shift

Step1&2 Input image&Segment via mean shift

The dataset (BSDS500) can be downloaded from the website. Because of the limitation of time, I just pick 150 images to evaluate. In this step, I adjust the spatial radius (hs) from 10 to 100, the interval is 10 and the color radius is set as 10 in mean shift to get different segmentation results.

Step3 Evaluate segmentation result with groundtruth

In this step, I evaluate the different segmentation results from last step. I choose PRI and VOI to evaluate the segmentation results.

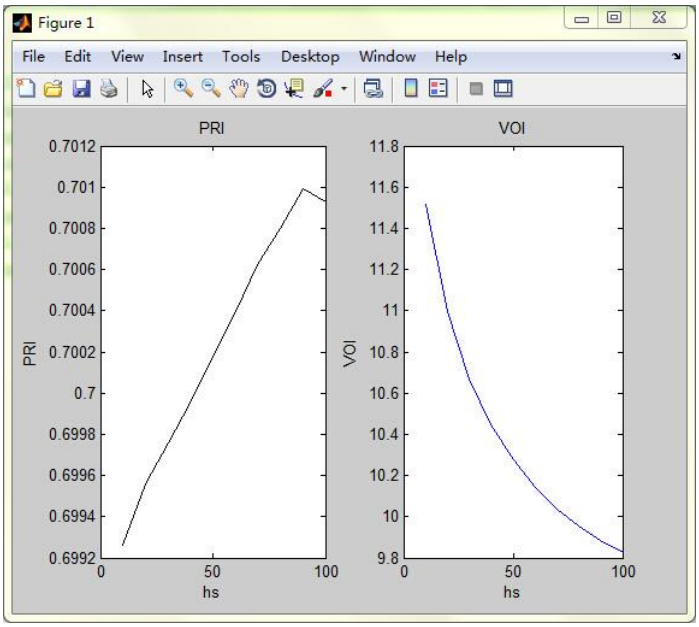

Figure8: Evaluation with same hr and different hs

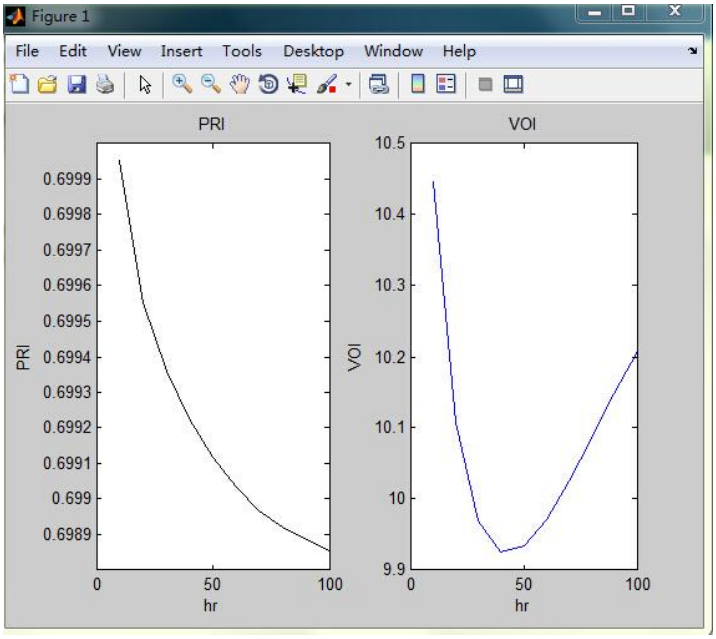

Figure9: Evaluation with same hs and different hr