CV Homework 1

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Q1 : How to evaluate the performance of different methods for eye fixation?

A1 : Using ROC Area Under the Curve(AUC)[7] to compare a saliency map(compute by fixation algorithm) against human eye fixation. However, due to dataset bias[9], Talter proposed a shuffled-AUC(s-AUC) score[11] to normalize the effect of center-bias. In s-AUC, positive samples are taken from the fixations of the test image, whereas the negative samples are from all fixations across all other images. If an algorithm get a high AUC score, then it has good performance.

Q2 : How to evaluate the performance of different methods for salient object detection?

A2 : F-measure[10]. For salient object segmentation task, the test/ground-truth saliency maps are binary maps obtained by first averaging the individual segmentations from the test/ground-truth subset, and then threshold with $Th = 0.5$ to generate the binary masks for each subset. Then compute F-measure of the test subset[9]. Also, if the F-measure of method is big, then this method has good preformance.

Q3 : Survey all existing saliency detection datasets and how the ground truth annotated in these datasets.

A3 : PASCAL-S[9]: first manually perform a full segmentation to crop out all objects in the image. following rules: 1) do not intentionally label parts of the image (e.g. faces of a person); 2) disconnected regions of the same object are labeled separately; 3) use solid regions to approximate hollow objects, such as bike wheels.
FT[1]: Can't open this link in paper[1]. http://ivrg.epfl.ch/supplementarymaterial/RKCVPR09/index.html
Bruce[4]: 70 subjects under the instruction to label the single most salient object in the image[9]. Per pixel raw count of annotations, e.g. the number of subjects that mark the pixel as salient object.
IS[8], MSRA10K[5][6][2][3] etc.

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