

CV Assignment 1: Image Segmentation

Due Date: April 24, 2017

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1 Introduction

In this assignment, you will implement five approaches for image segmentation and compare the performance of different image segmentation methods by using at least three evaluation measures.

The whole framework of the implementation for image segmentation is shown in Figure 1, it may serve as a reference for your assignment.

To get started with the assignment, you will need to download the BSDS500 dataset from the website¹. The dataset is explicitly separated into disjoint train, validation and test sets. Use the whole test set of BSDS500 for image segmentation.

The details of this assignment are given below in the following sections.

2 Image Segmentation

In this section, you will implement at least five image segmentation methods on all images to get different segmentation results.

2.1 Requirements

Choose one segmentation method respectively among:

¹<https://www2.eecs.berkeley.edu/Research/Projects/CS/vision/grouping/resources.html>

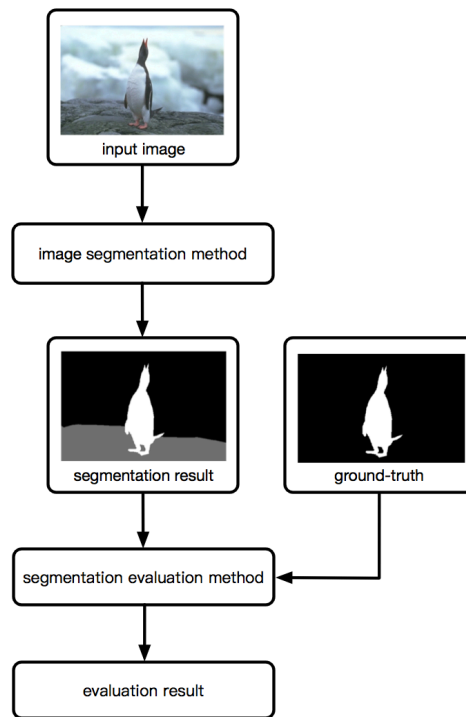


Figure 1: The framework of this assignment

- Threshold based segmentation
- Edge based segmentation
- Region based segmentation

Next, select at least two approaches from:

- Mean Shift
- Normalized Cut
- Efficient Graph-Based Image Segmentation
- gPb-owt-ucm

3 Evaluation of Image Segmentation

In this part of the assignment, you will compare the quality of image segmentation algorithms using at least three evaluation measures.

3.1 Requirements

Choose at least three evaluation measures from:

- F-measure
- Segmentation Covering
- Probabilistic Rand (PR) index
- Normalized Probabilistic Rand (NPR) index
- Variation of Information (VI)
- Global Consistency Error (GCE)
- Boundary Displacement Error (BDE)

Compare all segmentation algorithms on each evaluation measure you selected.

4 Submission

1. Your code
2. A report with your results and simple explanation

Zip all your files and submit your assignment to ouceecv@163.com with the subject: YourName_Assignment1.zip. The name of your zip file should be the same as the email subject.