Project Milestone: Convolutional Neural Network to Image Segmentation

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Abstract

The ABSTRACT is to be in fully-justified italicized text, at the top of the left-hand column, below the author and affiliation information. Use the word "Abstract" as the title, in 12-point Times, boldface type, centered relative to the column, initially capitalized. The abstract is to be in 10-point, single-spaced type. Leave two blank lines after the Abstract, then begin the main text. Look at previous CVPR abstracts to get a feel for style and length.

1. Introduction

Image segmentation refers to the partition of an image into a set of regions to cover it, to represent meaningful areas [2]. The goal is to simplify and/or change the representation of an image into something that is more meaningful and easier to analyze [1].

Segmentation has two main objectives: the first one is to decompose the image into parts for further analysis and the second one is to perform a change of representation [2]. Also, segmentation must follow some characteristics to identify regions, as it follows:

- Regions of an image segmentation should be uniform and homogeneous with respect to some characteristic, such as gray level, color, or texture [2];
- Region interiors should be simple and without many small holes [2];
- Adjacent regions of a segmentation should have significantly different values with respect to the characteristic on which they are uniform [2];
- Boundaries of each segment should be smooth, not ragged, and should be spatially accurate [2].

The future paper will evaluate segmentation methods using Deep Neural Networks and compares with classical methods of segmentation, using the superpixels approach. Also, the paper will evaluate the composition of classical methods with DNN approach, to speed up the training process and become more accurate.

The organization of this paper is as follows. In the next Section we discuss the problem statement. In Section 3 its explained how the will work and the results we expect. Then in Section 4 we present an some preliminary results.

2. Problem Statement

This paper

This paper evaluates segmentation methods using Deep Neural Networks and compares with classical methods of segmentation, using the superpixels approach. Also, the paper evaluates the composition of classical methods with DNN approach, to speed up the training process and become more accurate.

Main Dataset: Berkeley Segmentation Data Set and Benchmarks 500 (BSDS500) Provides Contour Detection and Image Segmentation Resources; As BSDS500 provides few images, it will be necessary using Data Augmentation; Other possible datasets: KITTI Road Evaluation: BSDS500 Performance Evaluation Provides evaluation using Precision and Recall Method; Code in Matlab provided with BSDS500 dataset .

3. Technical Approach

4. Preliminary Results

References

[1] S. A. Ahmed, S. Dey, and K. K. Sarma. Image texture classification using artificial neural network (ann). In *2011 2nd National Conference on Emerging Trends and Applications in Computer Science*, pages 1–4, March 2011.

[2] D. Domnguez and R. R. Morales. *Image Segmentation: Advances*, volume 1. 2016.