
DIGITAL IMAGE PROCESSING

Synthetic Data for Text Localisation in Natural Images

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Introduction

In this project we introduce a method to generate synthetic images of text in clutter. This engine tried to overlay synthetic text to existing background images in a natural way, trying to accounting local 3-D scene geometry.

Approach

We propose a new method for generating synthetic images of text that naturally blends text in existing natural scenes, using off-the-shelf deep learning and segmentation techniques to align text to the geometry of a background image and respect scene boundaries. We use this method to automatically generate a new synthetic dataset for text in clutter.

Our approach differs entirely from the one proposed by the original authors of the paper. We implement a completely different approach to the given problem statement, building it on the bases of techniques learnt in this course.

Method

- The entire pipeline is as shown below :

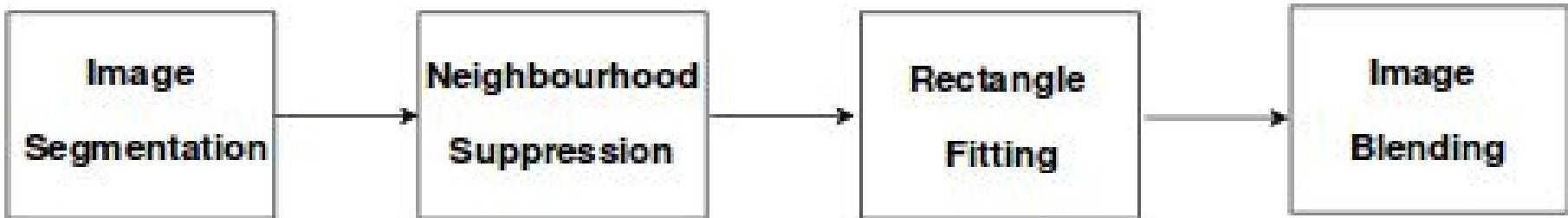
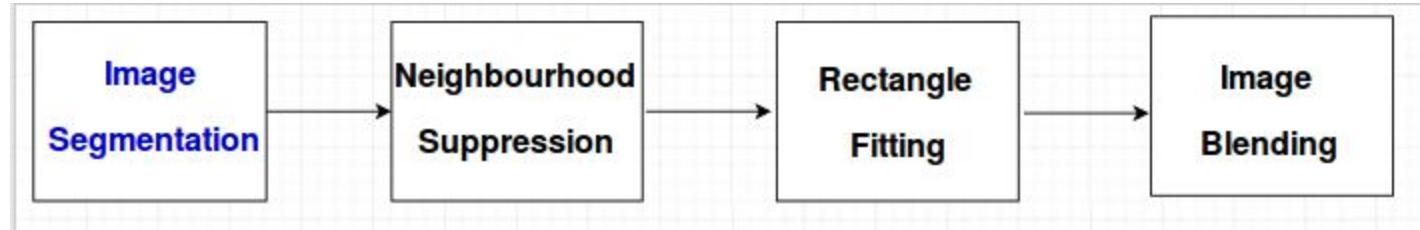


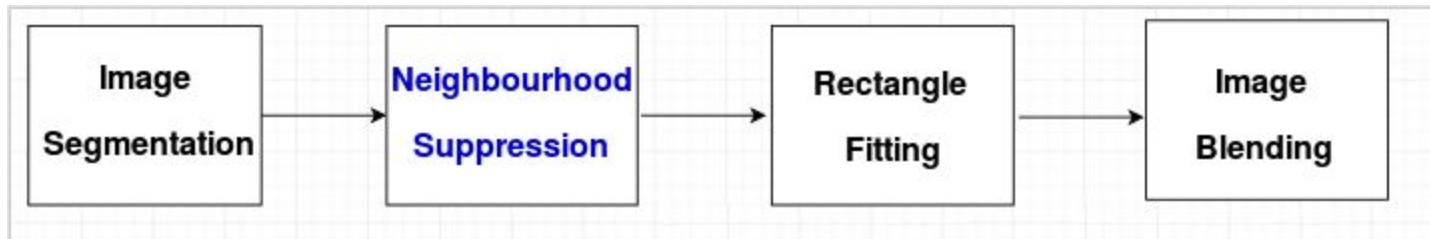
Image Segmentation



- Weighted K Means

$$d_p(y_i, c_k) = \sum_{v=1}^V w_{kv}^p |y_{iv} - c_{kv}|^p$$

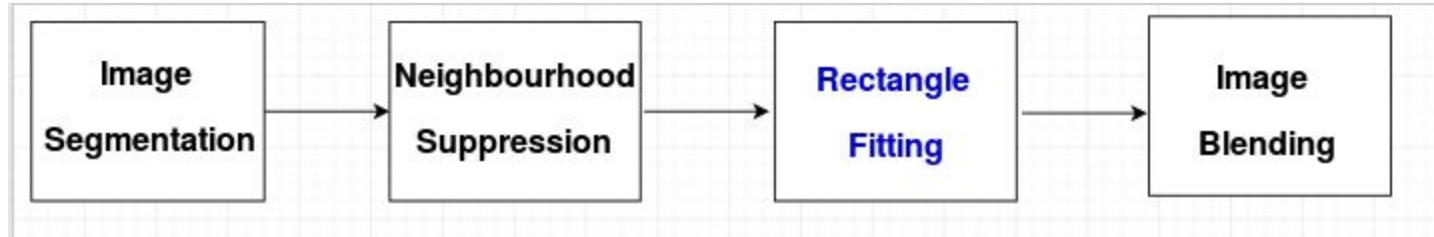
Neighbourhood Suppression



- For every pixel P_i in the segmented image,

$$P_i = \begin{cases} P_i & \text{if } \max(\mathbf{W}(P_i)) = \min(\mathbf{W}(P_i)) \\ mode(\mathbf{W}(P_i)) & \text{otherwise.} \end{cases}$$

Rectangle Fitting



- Naive Way : Dynamic Programming
- Improvements : Two ways
 1. Slope of the larger side of the rectangle
 2. Warping

Image Blending

For the blending of text with the selected area,Poisson Image Blending was used



Results



