

CSCI-B 657
Computer Vision
Spring 2016

Assignment 4 Final Report

marshal-rmeda-a4

Marshal Patel | marshalp

Rajeev | rmeda

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Running the code:

1. Go to the project directory and build the project using 'make'.
2. To get the output for assignment questions run the following commands:

Part 1:

Run with the following command - `./render image.png disp.png`

Note: Please make sure the input images are in the same directory as the source code.

Part 2:

Run with the following command - `./segment input.png seeds.png`

This will give output 4 output images, 2 of them are segmented into foreground and background images using naive segmentation and 2 using mrf segmentation.

The code will also output a disparity maps "disp_naive.png" and "disp_mrf.png".

Invoke render of part 1 for each disparity map. Rename the file generated, else the file will be overwritten for the second disparity map.

Note: Please make sure the input images are in the same directory as the source code.

Part 3

Run with the following command - `./stereo image1 image2 gt`

The code will output a disparity map with more labels.

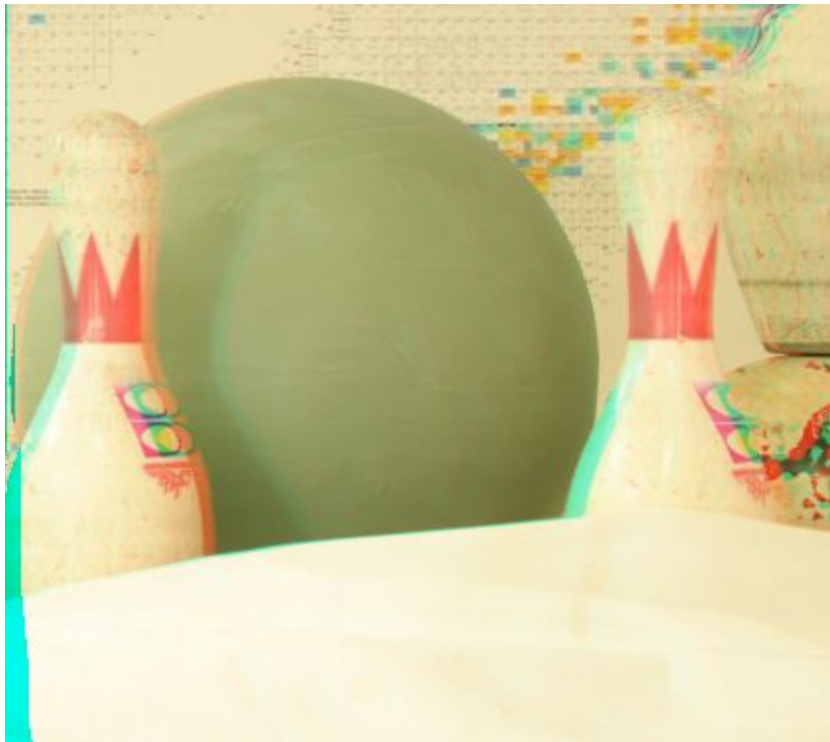
Note: Please make sure the input images are in the same directory as the source code.

Part 1

Parameters used: a constant - 0.1

In this part we take an image and a disparity map and generates an image that appears to be in 3d when viewed through the colored glasses.

Following is the output for part 1 when we run it with bowling image. (view1.png and disp1.png)



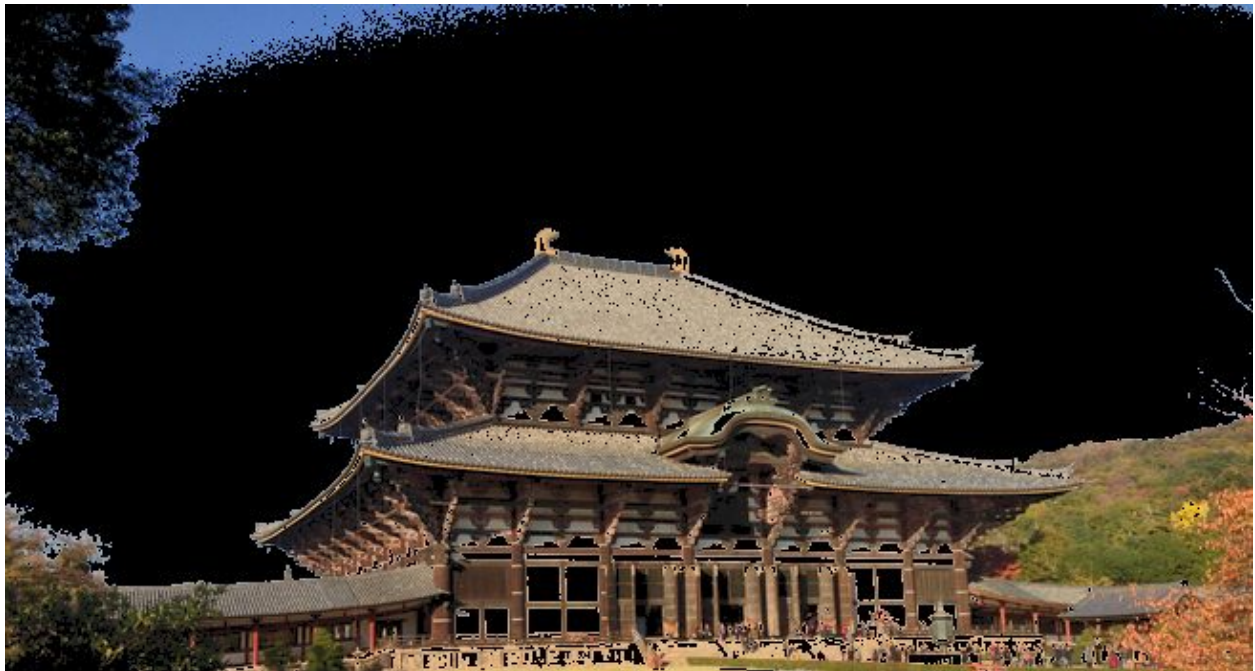
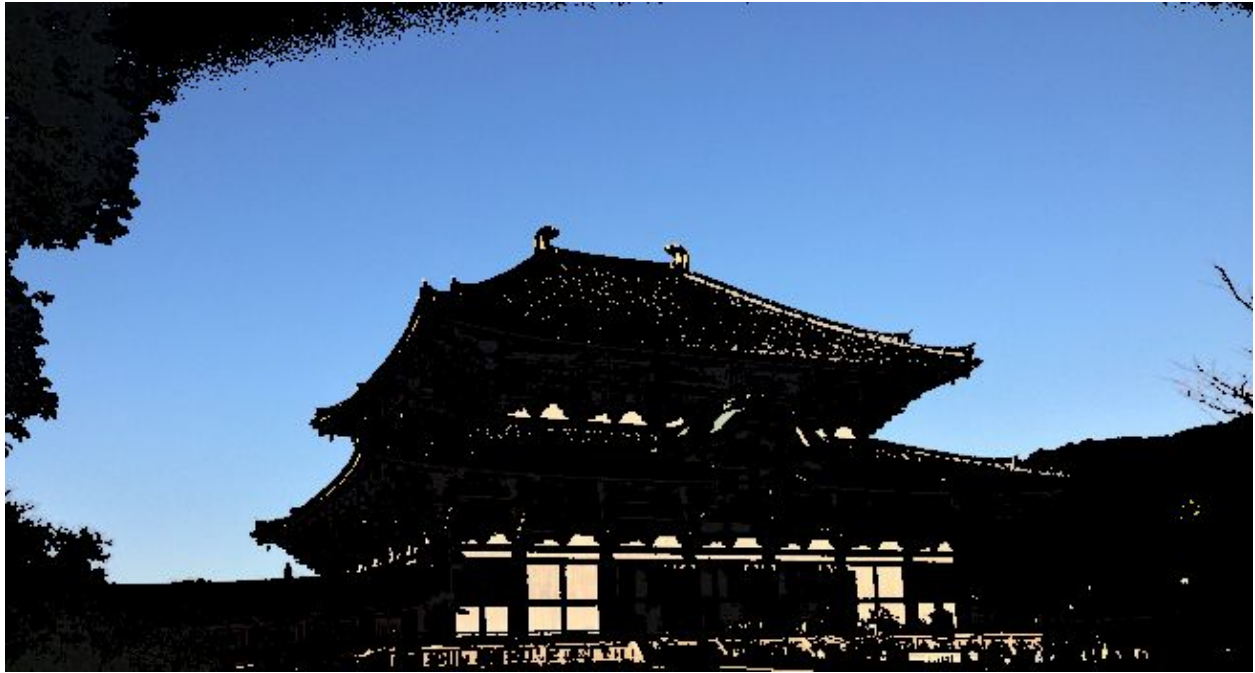
Part 2

Part 2.1

Parameters: BETA = 5

In naive segmentation we take mean and variance of the pixel values marked as foreground with blue line in seeds image and use gaussian model to distinguish between foreground and background pixels.

These are the results of running naive segmentation on nara.png using seeds from nara-seeds.png image. First image is background and second is foreground.



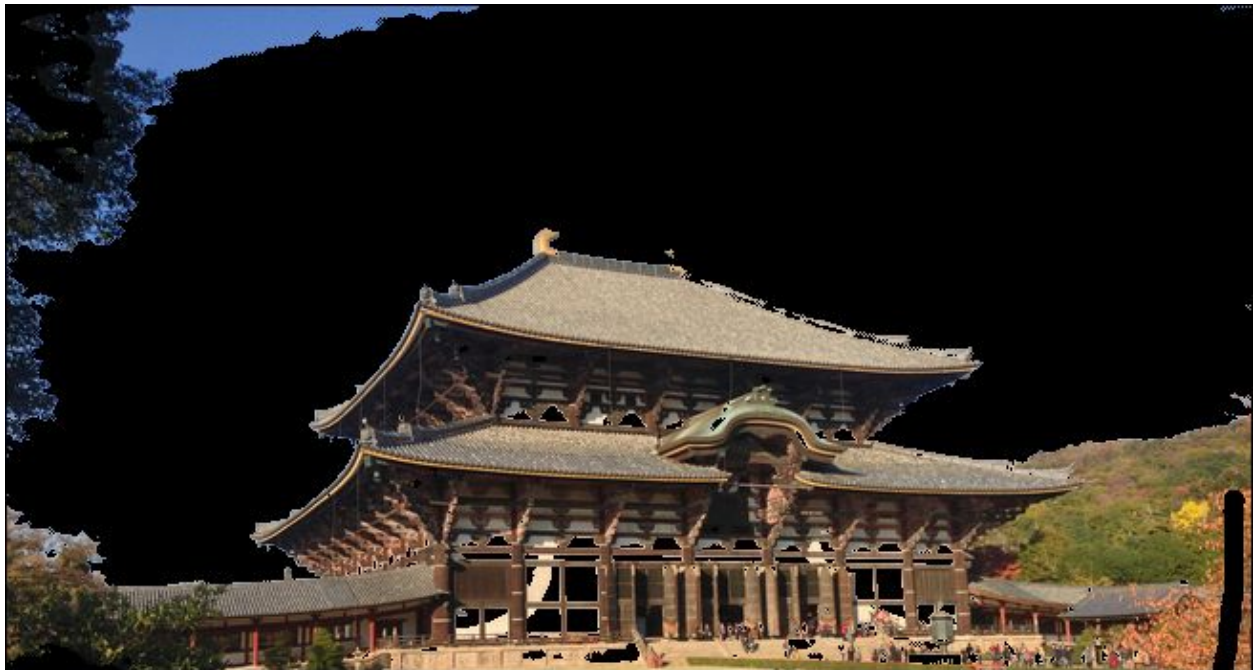
Part 2.2

Parameters: Iterations 10, ALPHA = 150, BETA = 5

Running time 15-20 mins.

In this part we implement segmentation using MRF. This works better than the naive approach we followed in part 2.1

These are the results of running naive segmentation on nara.png using seeds from nara-seeds.png image. First image is background and second is foreground.



Part 2.3

We create the disparity map using the naive and mrf segmentation we did previously and generate a 3D image as in part 2.1. The disparity map we we got from mrf segmentation gives better results compared to the naive segmentation one. But it still doesn't work as well as the ones generated using the given disparity maps for part 1.



Part 3

Parameters : Iteration 30, BETA: 5, Window size: 4, ALPHA: 250, Labels: 5

Running time: 30 to 45 mins.

Here is the output images we get after running the stereo program on Aloe images (view1.png, view5.png). First image is generated using naive technique and second using mrf.



Naive stereo technique mean error = 140.107

MRF stereo technique mean error = 482.182

Here is the stereogram produced for Adol image using part 1 when inferred with the disparity map produced using mrf stereo, compared with the stereogram produced using the disparity map given. Qualitatively, it looks pretty good.



Created using inferred disparity map.



Created using disparity map given.