Project ID: 30

Title: Removing Non-Uniform Motion Blur from Images

GitHub Link: https://github.com/neel1998/DIP_Project_2019

Team Name: Cheese DIP

Team Members:

1. Neel Trivedi (@neel1998)
2. Anchit Gupta (@Anchit1999)
1. Kunal Vaswani (@kunalvaswani123)

Main Goals:

1. The main goal of this project is to implement the "**Removing Non-Uniform Motion Blur from Images** (link)" paper by **Sunghyun Cho** *et al*.
2. Unlike traditional methods of removing blur which use a single motion blur kernel for entire image, this method aims to restore images blurred by varying motion blur kernels caused by different relative motions between the camera and the scene.
3. If time permits, we also aim to develop a mobile application to utilize this functionality of removing blurring from blurred image.

Problem Definition:

This project aims to deblur the image using different kernels corresponding to different relative motions between camera and scene.

This project provides an algorithm to remove spatially varying motion blurs from images. This task involves the following 3 different subproblems:

1. Estimation of motions
2. Segmentation into regions of homogeneous motion
3. Estimation of motion blur kernel

Since all these 3 problems are inter linked, they are jointly solved by energy minimization approach.

From two or more input images, images are restored by removing spatially varying motion blurs.

Results of the Project:

Given two or more blurry input images this project aims to restore a deblurred image using the energy minimization algorithm to find motion kernels related to different motion blurs. Some of the result of the project, (as given in the paper by **Sunghyun Cho** *et al*.) the first image in each image pair is the blurred input and the second image is the result after deblurring.

Timeline and Milestone:

Milestone 1:

During this first milestone we aim to go through the main paper as much thoroughly as possible.

Also read about the related work in the area of removing motion blur.

Get ourselves familiar with datasets and the algorithms used in the paper

Estimated Deadline: 15th October 2019

Milestone 2:

Start implementing the algorithm as described in the paper.

We aim to use python and related modules in the project.

Try to get at least as good results as has been described in the paper.

Estimated Deadline: 31st October 2019

Milestone 3:

Finalize the implementation of the algorithm

Test the algorithm with some real-world data collected by ourselves

More testing, documentation and refining of the implementation

Estimated Deadline: 10th November 2019

Milestone 4:

Prepare the final presentation of the project

If enough time, try to develop an Android or a Web app that utilizes this algorithm and allows user to upload blurry images and get them deblurred

Estimated Deadline: Deadline of project Submission