Assignment 3 : Bayesian Matting

7 points

Due Date: 19.10.2020

1 Problem Statement

Image Matting is the process of accurately estimating the foreground object in images and videos. It is a very important technique in image and video editing applications, particularly in film production for creating visual effects. In order to fully separate the foreground from the background in an image, accurate estimation of the alpha values for partial or mixed pixels is necessary. Bayesian matting models both the foreground and background color distributions with spatially-varying mixtures of Gaussians, and assumes a fractional blending of the foreground and background colors to produce the final output. It then uses a maximum-likelihood criterion to estimate the optimal opacity, foreground and background simultaneously. The goal of this assignment is for you to understand the real life implications of theory that are covered in the class. The task is to implement bayesian matting in python. Link to the CVPR 2001 paper on bayesian matting

2 Dataset

- Input Image
- Trimap segmentation of the images
- Ground truth alpha matting

3 Deliverables

1. **3-page (at max 4) report** with some example results. Also, compute the sum of absolute difference. Link to the well commented code should be given in the report. You can use colab and generate a link. Report should explain the mathematical aspect of bayesian matting.
2. Basic python libraries like OpenCV, Numpy, Scipy , etc. can be used.
3. Avoid any sort of copying and adhere to the institute's code of conduct. We shall be using plagiarism checker to keep a check.