

Course : Digital Image Processing

Project ID : 19

Flash Matting

Github Link : <https://github.com/Digital-Image-Processing-IIITH/dip-project-fft>

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Refered Paper :

Sun, Jian & Li, Yin & Kang, Sing Bing & Shum, Heung-Yeung. (2006). Flash matting. ACM Trans. Graph.. 25. 772-778. 10.1145/1179352.1141954.

Project Objectives and Motivations

Matting refers to the process of extraction of the foreground object from the image. This primarily involves the creation of an matte which can be used to separate the foreground from the background or even to combine the foreground with a different background to create a new image.

This is an important task in Photo editing .It has varied applications, the most prominent of it being in used in movies.

This is primarily done using chroma-keying. But chroma-keying is an extremely expensive process requiring studio conditions. Hence it is important to ensure more generically applicable mechanisms to extract mattes.

Consider the below Equation

$$I = \alpha F + (1 - \alpha)B$$

From a given Input Image I, the aim is to efficiently approximate the value of F which is the

foreground Image, and B which is the background Image and α which is value of the alpha channel or matte.

In images when the the foreground and the background is complex , or when the background and foregroun is not very distinguishable,Matting becomes extremely challenging.

We propose to implement a more efficient and robust matting algorithm using the pixel-pixel aligned pair of flash and no-flash images. We implement this functionality using an algorithm called **Joint Bayesian Flash Matting**.

This is based on the assumption that there wouldn't be significant differences in the background part of the image in both the flash and non-flash aspect.

Finally we plan to test our code in a variety of images to demonstrate the effectiveness of this approach.

Expected Result

We plan to submit a final software(most likely in the a notebook,though not final) that will allow users to create efficient mattes of a input image and also allow them to transfer a foreground of an input image to the background of another input image.

Project Milestones

9 Nov - 15 Nov : Collection and Preprocessing of the images.Also the coding of the trimap generation

16 Nov - 23 Nov : Implementation of the Joint Bayesian Matting Algorithm

24 Nov -29 Nov : Robust Testing with Image and generation of the Resulting Images.Add the functionality to merge foreground and background of the Images.

29 Nov - 3rd December : Creation the of the demo/report and the final Presentation

- Given we have sufficient time and availability of the appropriate data available ,we may implement a few extensions of the general flash matting algorithm

Dataset

We need a dataset which contains paired flash-and non flash images.
Luckily such a dataset exist.

<http://yaksoy.github.io/faid/>

Yagiz Aksoy, Changil Kim, Petr Kellnhofer, Sylvain Paris, Mohamed Elgharib, Marc Pollefeys, & Wojciech Matusik (2018). A Dataset of Flash and Ambient Illumination Pairs from the Crowd. In Proc. ECCV.