Algorithms and Application in Computer Vision - 046746

Homework #1

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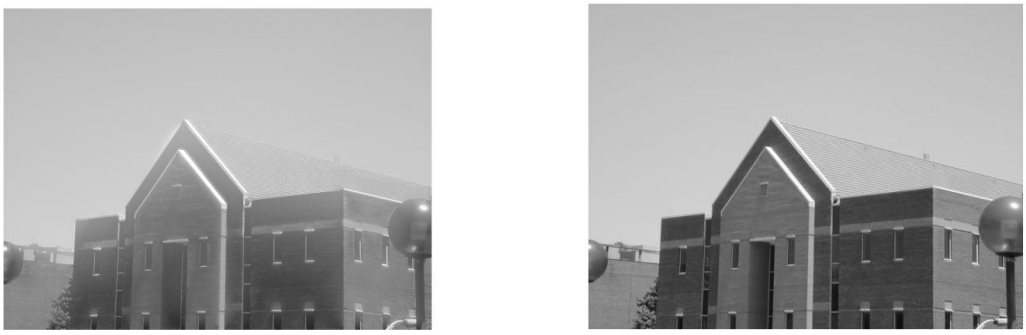
I. Part 2

A. Part 2b

The default format for image data in Matlab is **uint8**. This format does not support negative numbers that result from subtraction of image data matrices (all $L_l[I]$ except for $l = n$), thus when reconstructing back the original image the reconstruction is not accurate (Fig 1a) and results in a bloom effect. To solve this problem, the image data needs to be converted to **double**, thus supporting negative values. This allows for an accurate reconstruction (Fig 1b).

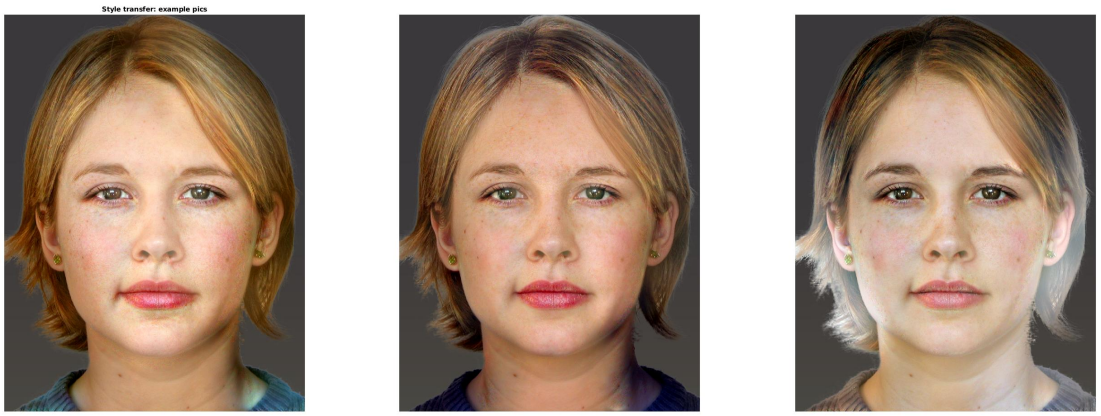


(a) (b)

Figure 1: **(a)**: recreated image from uint8 laplacian pyramid. **(b)**: recreated image from double laplacian pyramid

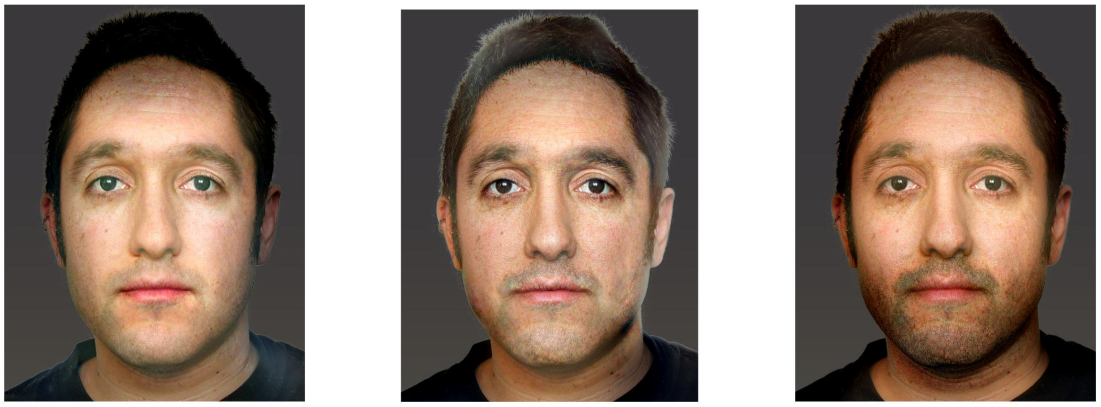
B. Part 2g

In this section we present the style transfer of images of a woman (Fig. 2, image 0004_6) and a man (Fig. 3, image 0006_001) with 3 different styles, one for each image. Note that for image 2c the style image had a short-haired woman with a light gray background, hence part of the woman's hair is gray.



(a) (b) (c)

Figure 2: Style transfer of the woman photo. **a** with image 6, **b** with image 16, **c** with image 21.

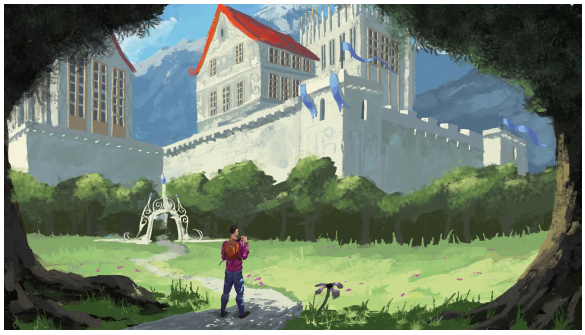


(a) (b) (c)

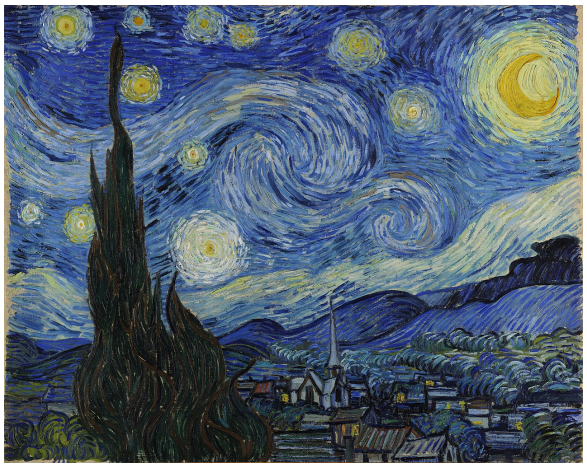
Figure 3: Style transfer of the man photo. **a** with image 0, **b** with image 9, **c** with image 10.

C. Part 2h

In Fig. 4 we present a style transfer for a painting made by one of the submitters to Van Gogh's Starry Night. The result is presented in Fig. 4c; the style transfer changed the color scheme and some of the textures. Note that in Starry Night the top right yellow circle is transfered profoundly to the style transfer image.



(a)



(b)

(c)

Figure 4: **a** a painting destined to style transfer. **b** Starry Night by Van Gogh. **c** the style transfered painting.