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Abstract

With this project, we created a photomosaic filter. In this report file, we describe our methods to create this photomosaic filter. And also we will provide results after applying this filter on input images.

1. Introduction

In the field of photographic imaging, a photographic mosaic, also known under the term Photomosaic, a portmanteau of photo and mosaic, is a picture that has been divided into tiled sections, each of which is replaced with another photograph that matches the target photo. When viewed at low magnifications, the individual pixels appear as the primary image, while close examination reveals that the image is in fact made up of many hundreds or thousands of smaller images.

2. Related Work

Image collecting. Collecting images from different color tones.

Image resizing. Resizing input image and collected images.

Image matching through lab colorspace. Comparison operation between each image taken from collected images and every small pieces of given input image according to their l and a and b values.

3. The Approach

First we created an image stock with a high number of images from multiple color tones. Each element of this stock is used as a little piece of our final mosaic image.

After reading the image stock, our code resizes the input image to a 2000x2000 square.

Before the matching operation, the code transforms the input image to lab color space. And then it will divide this input image into equal pieces.

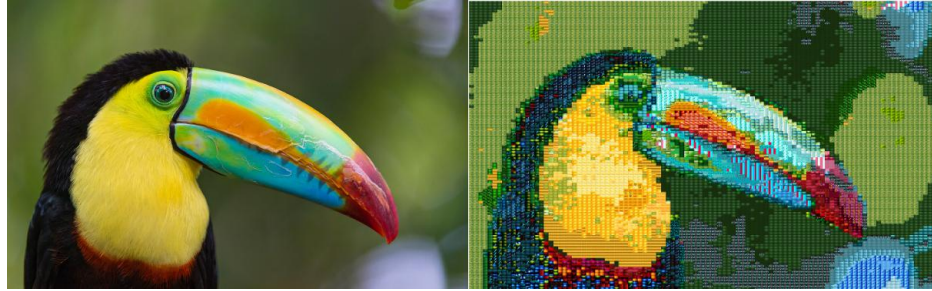
After that we take image from our image stock, then matching the best similar color according to minimum distance of l a b values for every piece*. We take the best matched image, and resize it to piece size. Later we put this image to matched coordinates in rgb colorspace to the original image.

*Here "piece" stands for every little part of output mosaic image.

4. Results

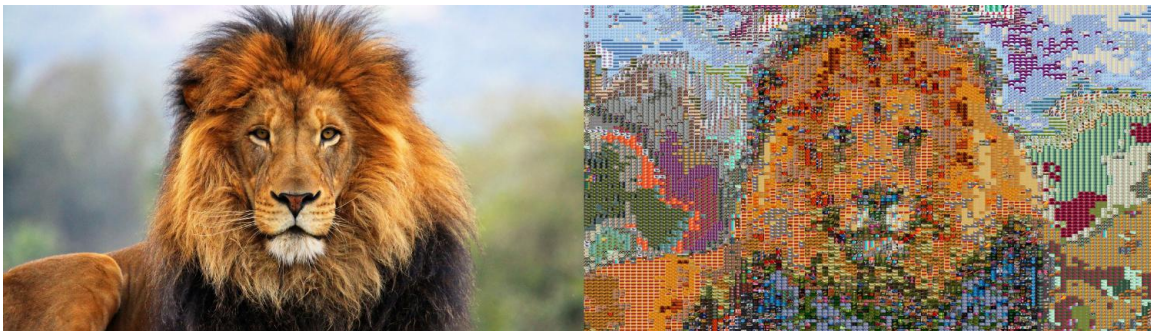
First we begin with an image stock which has 726 images. These images had solid colors (actually they were background images e.g. Red backgrounds, blue backgrounds etc.)

(a) Result with an image stock consisting of 726 images. Here image piece size is 20 pixels.



Now we add more images to our stock. Following results are obtained with an image stock consisting of 2225 images. And these added images are not only background images, these are also real images. Such as underwater image for blue tones, a forest image for green tones, a space image for black tones etc.

(a) Result with new image stock. Here image piece size is 20 pixels.



With this lion image we thought that, we can get a more satisfying result if we decrease the image piece size. Then we changed the value of this piece size to 20 from 10. Now we can see what happens after this change in the following result image.

(a) Result with new image stock. Here image piece size is 10 pixels.



(a) Result with new image stock. Here image piece size is 20 pixels.

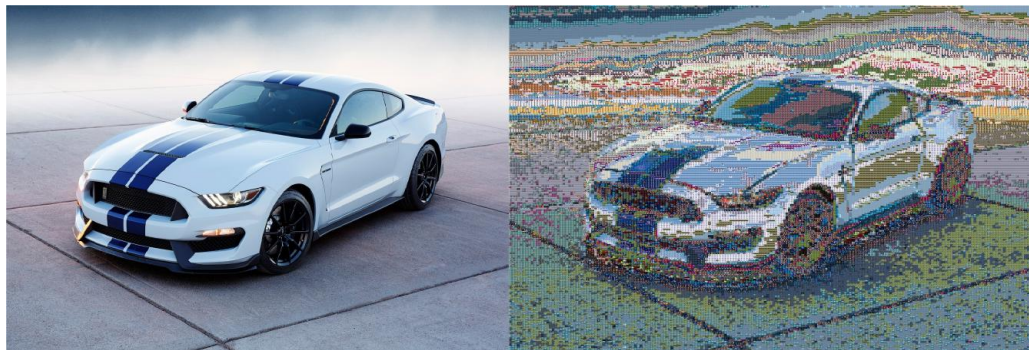


(a) Result with new image stock. Here image piece size is 10 pixels.



After getting the results which are shown above, we got a more detailed result image of given input image. Then we decided that to use image piece size as 10 in the following tests.

(a) Result with new image stock. Here image piece size is 10 pixels.



(a) Result with new image stock. Here image piece size is 10 pixels.



(a) Result with new image stock. Here image piece size is 10 pixels.



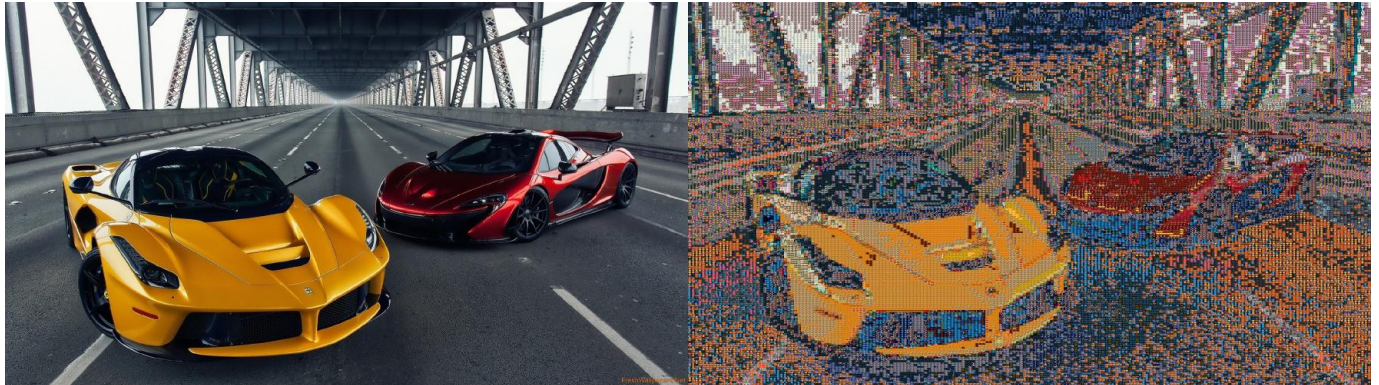
(a) Result with new image stock. Here image piece size is 10 pixels.



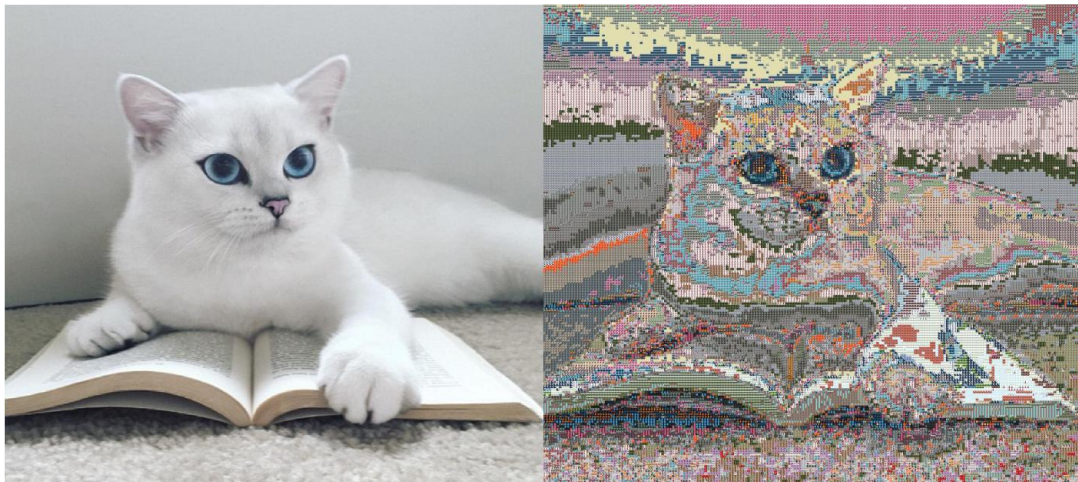
(a) Result with new image stock. Here image piece size is 10 pixels.



(a) Result with new image stock. Here image piece size is 10 pixels.



(a) Result with new image stock. Here image piece size is 10 pixels.



5. Conclusions

To obtain more satisfying results;

- More images from different color tones can be added to image stock.
- The image piece size can be reduced.

We could do these changes, but the execution time grows with all of these changes. For example reading images from image stock nearly takes 86 minutes.

And also, when image piece size was 20 pixels, the execution time was nearly 10 minutes long. After changing it to 10 pixels, the execution time became nearly 60 minutes, and this is equal to one hour.

6. References

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