

# Visual Quality Enhancement Of Image Mosaic Using Image Division and Texture Filtering Techniques

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**Abstract-** We describe a process for creating image mosaic – an agglomeration of multiple small images collated in a way that when seen from a distance they connote a larger image. The multiple small images are collated to match a master image. This collation of small images is automatic. Color adjustments further help to better connote the overall form. Use of Texture filter for smoothing the edges make the collection of images look more like the master image. The proposed work also supports image importing from facebook and flickr websites.

**Keywords –** Image Mosaic, Tiles, Texture Filtering, Facebook, Flickr.

## I. INTRODUCTION

A distinct property of the human eye allows them to view an assemblage of small pieces of colored glass, stone, or other materials as a whole image when seen from a particular distance. This property was used by artists to introduce a unique art form called mosaicing. This same principle can be applied to images as well. A collection of small images arranged in a particular way appear to be one single image when seen from far off. This technique is called image mosaicing.

People have many images in their social networking website accounts. They may want to use these images for creating mosaics. The proposed method allows user to give images from social networking website accounts (Flickr and Facebook) as inputs. Using the stated mosaicing algorithm, the user will be able to create a master image which would be a collection of the images taken from users' Flickr and Facebook albums.

The concept of photo mosaics originated in a computer graphics system called DominiPix [1], in which pictures are constructed from sets of dominoes. Silvers later conceived of the idea of dividing a target image into smaller regions, eventually founding a company that now produces photo mosaics on a commercial basis [2], [3]. Further works by Kim and Pellacini [4] and Li and Yuan [5] have contributed much to the problem by exploring a variety of techniques for generating photo mosaics. A thorough survey of the digital mosaic generation techniques is provided by Battiato [6].

According to Tran [7], the effectiveness of a photo mosaic generating algorithm is determined by three factors: similarity between the photo mosaic and original image, granularity of individual tiles and the variety of selected tiles.

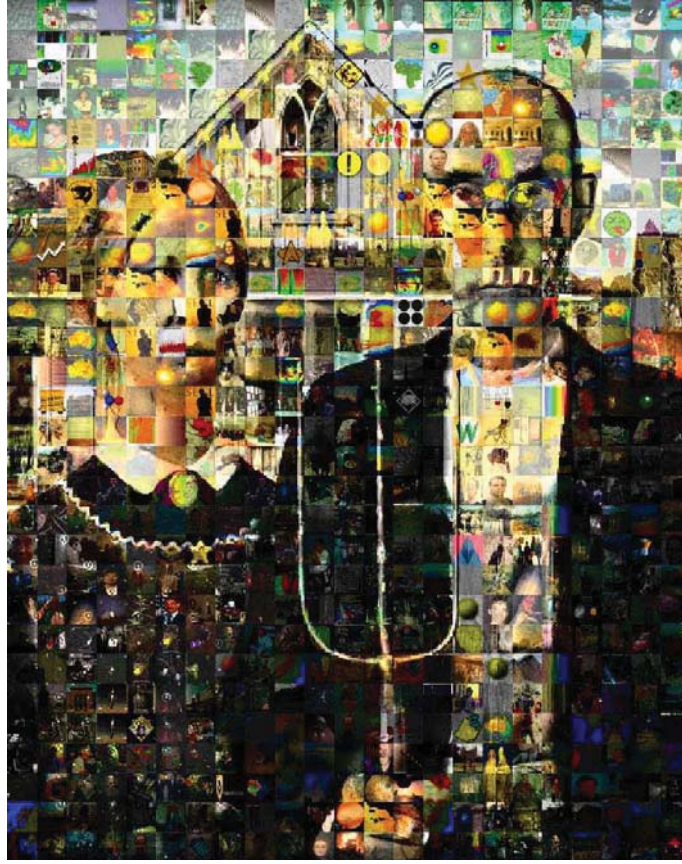


Figure 1. *American Gothic* composed of pictures from the Web.

Several researchers have investigated the use of computers to produce pictures in the style of impressionist paintings. Haeberli described a method of creating an image whose overall form matches a given picture, but is composed of tiny brush strokes [8]. Meier extended this work to apply to 3D animation [9], and Litwinowicz subsequently extended it to video [10]. Like these projects, our work begins with the larger form; however, rather than using small brush strokes, we use small images to convey the larger form. Potential applications of image mosaicing are encoding extra information in an image for transmission or security, new forms of halftoning screens for printing, and association of images for advertising.

## II. PROPOSED ALGORITHM

The proposed system aims at creating digital mosaics from an existing user collection of images, as well as the large collection of images available online. Online image collections are maintained in websites like flickr. Many users also have a huge collection of personal images on social networking websites like facebook. The proposed system aims at creating digital mosaics from the local stores as well as such web sources.

The complexity of creating the mosaic remains, but it is extended by adding the online locations in the search options to have a wider approach and better results.

This is an outline of what happens when the user chooses to generate a mosaic.

1. Query our sources for a photoset
  - User can select a source from three available sources from where the images which are going to be used for populating the mosaic will be picked.
  - The three available sources are:
    - a) Local file system
    - b) Flickr

## c) Facebook albums

2. Accept a master image and resolution (n) from the user
3. Split up the master picture into n tiles and analyze the colors of these tiles  
Based on the resolution provided by the user, the image will be divided into tiles (Grid). Higher the resolution more will be the number of tiles thus giving a better quality mosaic.  
For example: Suppose user inputs resolution as 10. Hence the image will be divided into 10\*10 tiles.

1	2	3	4	5	6	7	8	9	10
2									
3									
4									
5									
6									
7									
8									
9									
10									

Figure 2. Master Image divided into tiles.

4. For each result we receive from our query
  - a) Analyze its average color and compare it with the average color of each tile
  - b) Place it in a region of the mosaic where it is a better fit than what already exists there
5. When a user-defined threshold has been reached (n), stop processing
6. Apply texture filtering  
Before displaying the final output, the output image goes under a texture filtering or texture smoothing process. This process allows a texture to be applied at many different shapes, sizes and angles while minimizing blurriness, shimmering and blocking.
7. Display the final output to the user.

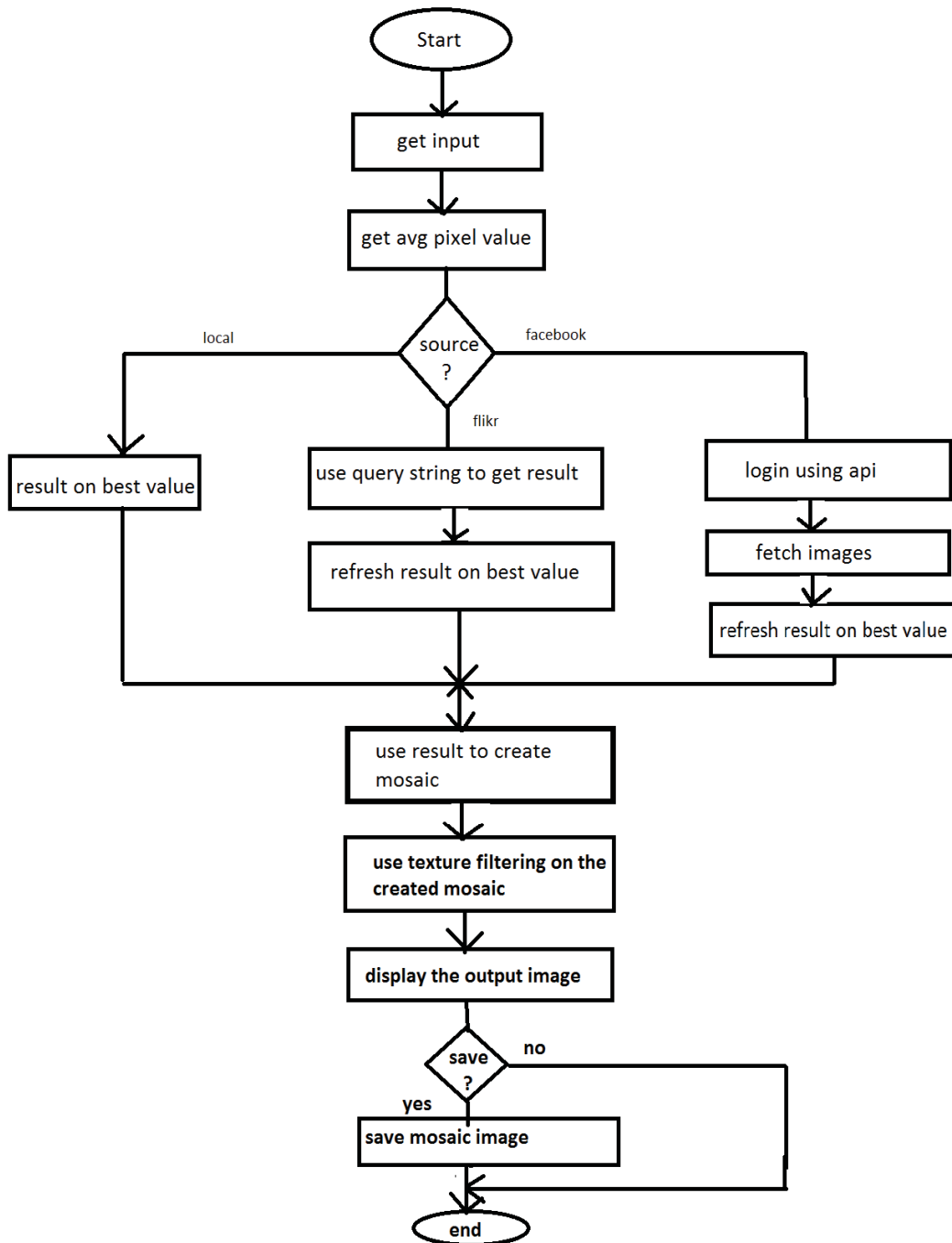


Figure 3. Image Mosaicing algorithm Block Diagram

### III. EXPERIMENT AND RESULT

The test set for this evaluation experiment image mosaicing using images randomly selected from the Internet. The PC for experiment is equipped with an Intel Core 2 Duo 2.9GHz Personal laptop and 2GB memory.

The proposed scheme is tested using ordinarily image processing. From the simulation of the experiment results, we can draw to the conclusion that this method is robust to many kinds of image mosaics of different resolutions.

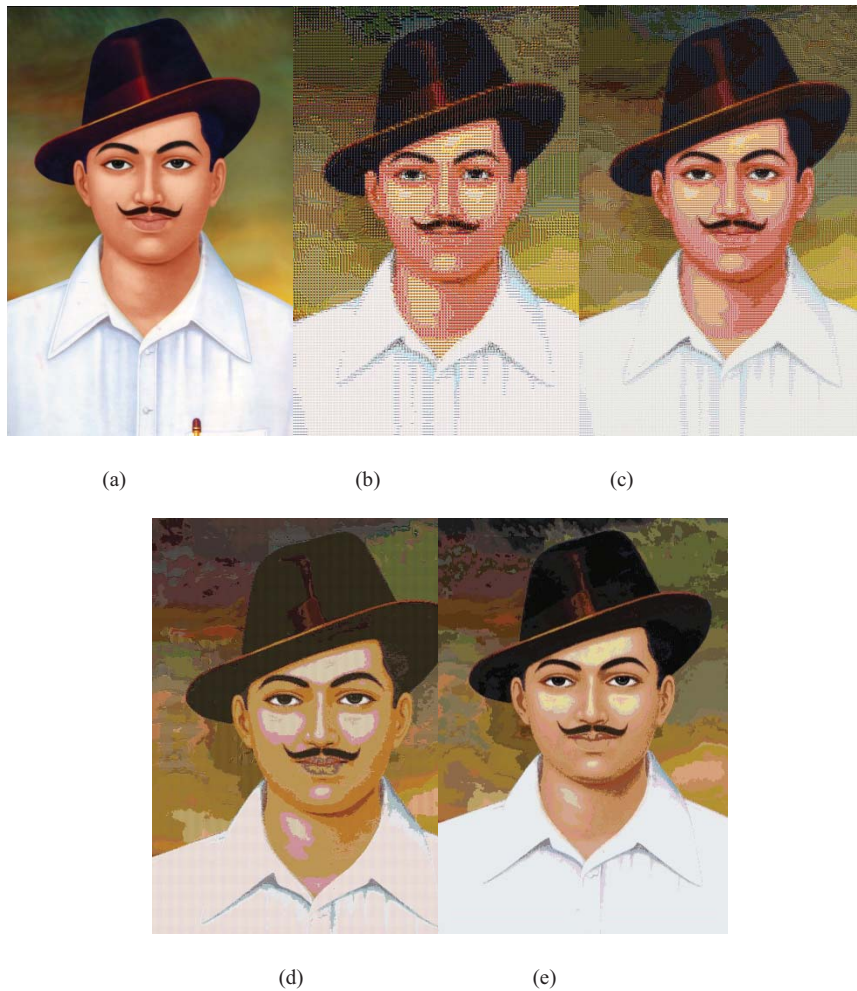


Figure 4. (a) Original Image (b) Mosaiced output with resolution 100 (c) Mosaiced output with resolution 250 (d) Mosaiced output with resolution 450 (e) Mosaiced output with resolution 500.

#### IV.CONCLUSION

This paper describes a method of creating image mosaics using image division and image smoothing techniques. Image division is based on the resolution specified by the user and image smoothing is performed using texture filtering. Texture filtering can be applied at many different shapes, sizes and angles while minimizing blurriness, shimmering and blocking. This method allows mosaicing to be performed on complex source images with an acceptable computational cost. Allowing user to choose images from social networking websites makes this method a unique one.

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