

Research Article

Survey on Mosaic Images Creation

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Abstract

Mosaic means collection of smaller images in various colors. Mosaic, is an image that has been divided into equal sized rectangular images, called as tiles of images each tiles of one image is replace with tiles of target image. Mosaic must be made up of hundreds and thousands of smaller images of the various color. There are two type of mosaic, which depends on how the matching is done. In the simpler type, each part of the target image is change into a particular color. Also each part of the other images is also reduced to a particular color. That part of the target image is then replaced with part of the other image where these colors are matches. In result, the target image is reduced, and then each of the resulting pixels is replaced with an image whose average color matches that pixel. In another type matching is done by comparing each pixel in the rectangle to the corresponding pixel from each other image. The rectangle in the target is then replaced with the other images.

Keywords: Color transformation, image encryption, mosaic image, secure image transmission.

1. Introduction

Mosaics are one form of art in which a large image is formed by a gathering of small images called tiles. Various mosaics can be created for an image depending on the choice of tiles and the restriction in their placement. Tile mosaics, for example, are images made by cementing together uniformly colored polygonal tiles carefully positioned to emphasize edges in the composite picture; mosaicing of image can be classified broadly into two methods such as direct method and feature based method. Direct Method uses information from all pixels. It iteratively updates an estimate of homography so that a particular cost function is minimized. Sometimes phase-correlation is used to estimate the a few parameters of the homography. In Feature Based Method a few corresponding points are selected on the two images and homography is estimated using these reliable points only. Feature Based Methods are in general more accurate. It can handle large disparities.

The images are mosaic in the number of way such as Jigsaw Image Mosaic, where image tiles of arbitrary shape are used to compose the final picture. A jigsaw image mosaic is one kind of puzzle image, composed of many arbitrary shapes of tiles selected from a database. It creates many arbitrary shapes in kinds of puzzle image. Another type of automatic method for mosaicing images by using Voronoi diagrams. The

Voronoi diagrams are reduced so that the error between the original image and the resulting image is small. The mosaic image is generated by using the sites and edges of the Voronoi diagram (*Yoshinori Dobashi and Toshiyuki Haga et al 2002*). A Voronoi diagram is a geometric structure that represents proximity information about a set of number of points or objects. In a set of sites or objects, the plane is partitioned by assigning to each point its nearest site. In the next of mosaic is the Analysis of Multiresolution Mosaic Image It aims to combine images such that no obstructive boundaries exist around overlapped regions and to create a mosaic image that exhibits as little distortion as possible from the original images. When two or more images are overlapped to form a single image, finding an ideal image can be difficult. An image mosaic processing technique can be applied to greatly reduce this difficulty.

To mosaic an image is to combine overlapped images so that the mixed image contains no obstructive boundaries in the transition region while preserving the general appearance of the original images. In today's era, number of images from various sources are used and transmitted through the internet for various Applications, such as album of personal photograph, confidential enterprise archives, storage systems, medical imaging systems, and military image databases (*Ming-Shing Su, Wen-Liang Hwang, and Kuo-Young Cheng et al 2004*). These types of images usually contain private or confidential information so they should be protected from the loss of confidential data, and for that many methods have been proposed for

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securing image transmission, for secure image transmission two common approaches are image encryption and data hiding. In the encryption of images use various methods to encrypt the data or image using a key concept. The encrypted image is a noise image so that no one can obtain the secret image from it unless user has the correct key. The encrypted image does not have any meaning, and cannot provide any type of additional information before decryption and may attract an attacker's attention during transmission due to its randomness in form (Ya-Lin Lee and Tsai et al 2014).

By creating mosaic image a new technique for secure image transmission is proposed, which transforms a secret image into mosaic images which look like similar to target image. The transformation of the images is controlled by a secret key, and only the person recover the secret image which known about that image from the mosaic image. The another type of mosaic image used to secure data called as secret fragment mosaic image The mosaic image is the result of rearrangement of the fragments of a secret image in disguise of another image called the target image.

This paper has following structure: section 2 is about the literature survey contains the survey on previous papers section 3 survey on different mosaics in which different forms of mosaics will be explain section 4 is about the conclusions.

2. Literature survey

Kim and Pellacini et al 2002. has proposed jigsaw image mosaic it also called as puzzled image mosaic, composed of tiles selected from a database which is equal shape image. It creates many arbitrary shapes called tiles in kinds of puzzle image. The generation of a Jigsaw Image Mosaic is a solution problem: given an arbitrarily-shaped container image and a set of arbitrarily-shaped image tiles, fill the container as compactly as possible with tiles of similar color.

Yoshinori Dobashi and Toshiyuki Haga et al 2002. has proposed the voronoi diagram to add various effects to the mosaic image, such as simulation of stained glasses. The mosaic image is generated by using the sites and edges of the Voronoi diagram. We use graphics hardware to efficiently generate Voronoi diagrams. A Voronoi diagram is a geometric structure that represents proximity information about a set of points or objects. Given a set of sites or objects, the plane is partitioned by assigning to each point its nearest site.

Ming-Shing Su, Wen-Liang Hwang, and Kuo-Young Cheng et al 2004. has proposed multi resolution mosaic images. To combine images such that no obstructive boundaries exist around overlapped regions and to create a mosaic image that exhibits as little distortion as possible from the original images. Finding the ideal image after combing is difficult and to overcome this difficulty proposed system.

Battiato, Blasi, Farinella and Gallo et al 2007. has proposed digital mosaic framework in which divide

mosaic images into four types, including crystallization mosaic, ancient mosaic, photo-mosaic, and puzzle image mosaic. The first two types are obtained from decomposing a source image into tiles and reconstructing the image by properly painting the tiles, and so they both may be called tile mosaics.

I-Jen Lai and Wen-Hsiang et al 2011. has proposed a method to create secret fragment visible mosaic image for secure image transmission. The mosaic image is the result of rearrangement of the fragments of a secret image in disguise of another image called the target image preselected from a database. Recover from embed information of secret image.

Li Jing et al 2013. has proposed a method of remote viewing image mosaic technology based on fuzzy cellular automata corner detection in substitution, to improve the effect of remote video monitoring system using fuzzy cellular automata viewing the mosaic image.

Hae-Yeoun Lee et al 2005. has proposed an automatic photo-mosaic algorithm through block matching and intensity adjustment. The input image is split into block unit to extract feature. Then, each block is compared with photos in photo database to find the similar photo with the block.

Lukac and Plataniotis et al 2014 has proposed method indexes captured images directly in the single sensor digital camera, mobile phone and pocket device by embedding metadata information in the CFA domain. Single sensor digital camera captured indexed.

Ya-Lin Lee and Tsai et al 2014. has proposed method of secret fragment visible mosaic image for the secure transmission of the data using key. Processing the key can reconstruct the secret image by retrieving the embedded information, while a hacker without the key cannot.

3. Survey on different mosaics

3.1 Jigsaw Mosaic Images

The Jigsaw Image Mosaic creation is a solution to problem, given an arbitrarily shaped container image and a set of arbitrarily-shaped image tiles, fill the container fully possible with tiles of similar color.

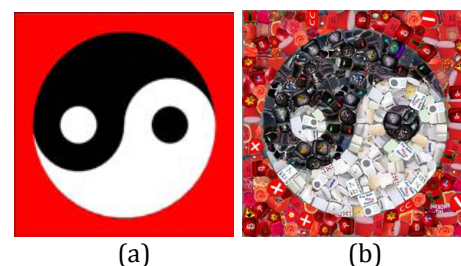


Fig. 3.1 (a) Original image (b) Jigsaw Mosaic Image

In this mosaics image tiles of arbitrary shape are used to compose the final arbitrarily-shaped picture called

Jigsaw Mosaic Images. Takes a container image of arbitrary shape as input and a set of image tiles of arbitrary shape; it then packs the container as compactly as possible with tiles of similar color to the container taken from the input set while optionally deforming them slightly to achieve a more visually-pleasing effect. The authors approach the problem by defining a mosaic as the tile configuration that minimizes a mosaicing energy function and introduce a general energy-based framework for mosaicing problems

3.2 Mosaic images using Voronoi Diagram

A Voronoi diagram is a geometric structure that represents proximity information about a set of points or objects. Given a set of sites or objects, the plane is partitioned by assigning to each point its nearest site. The points, whose nearest site is not unique, form the Voronoi diagram. Method consists of two processes. In the first process, the mosaic image is automatically generated by creating the optimal Voronoi diagram so that the error between the original image and the resulting image becomes as small as possible. The second process allows the user to add various effects to the mosaic image created by the first step. The second process is designed in accordance with our observation of stained glass windows since stained glass is one of the applications that use mosaic images. One important feature is that there are color variations in each region of the stained glass. In the Voronoi diagram placing the sites at random and filling each region with a color sampled from the image. This approach tessellates the image with tiles of variable shapes and but it does not attempt to follow edge features; the result is a pattern of color having a cellular-like look.



(a) (b)

Fig 3.2 (a) original image (b) Final image

3.3 Analysis on Multiresolution Mosaic

When two or more images are overlapped to form a single mixed image, finding an ideal image combination can be difficult. An image mosaic processing technique can be applied to greatly reduce this difficulty. To mosaic an image is to combine overlapped images so that the mixed image contains no obstructive boundaries in the transition region while preserving the general appearance of the original images. An image mosaic is typically completed in two stages. In

the first stage, the corresponding points in the two to-be-combined images are identified And registered. This stage is usually referred to as image registration. In the second stage, the intensities of the images are blended after the corresponding points have been registered. Not all applications of image mosaicing require registration, such as in movie special effects.



(a)



(b)

Fig. 3.3 (a) image with overlapped boundary (b) image without boundary

3.4 Secrete Fragment Visible Mosaic Images

In this mosaic, transforms a secret image into a meaningful mosaic image with the same size and looking like a preselected target image. The transformation process is controlled by a secret key, and only with the key can a person recover the secret image nearly lossless from the mosaic image. A new type of computer art image called secret-fragment-visible mosaic image is proposed, which is created by composing small fragments of a given image to become a target image in a mosaic form. These effects hide the images and keep it secret. To create a mosaic image of this type from a given secret color image, the one color scale is transformed into a new color scale, based on which a new image selecting from a database as a target image is the most similar to the given secret image. Secret image is first divided into rectangular shaped fragments, called tile images, which are fitted into a target image.



(a) (b) (c)

Fig 3.4 (a) Secrete image (b) Target image (c) Secrete fragment visible mosaic image

Conclusions

A new type of the image form called mosaic image from two images or using different tiles of images tiles is nothing but the small rectangular form of image. In this paper studied more than one form of mosaics such as puzzle form of mosaic, mosaic using voronoi diagram, multiresolution mosaic and secrete fragment visible mosaic. In the puzzle mosaic given an arbitrarily shaped container image and a set of arbitrarily-shaped image tiles, fill the container as compactly as possible with tiles of similar color. In the second form mosaic image is form using voronoi diagram and multiresolution mosaic two images are overlapped and no boundary shown between overlapped region. In secrete fragment visible mosaic form a mosaic by using secrete image and target image. Mosaicing image is useful for a variety of tasks in vision and computer graphics. In this paper study of methods of mosaics are given.

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