www.ijecs.in
International Journal Of Engineering And Computer Science ISSN: 2319-7242
Volume 3 Issue 6 June, 2014 Page No. 6286-6290

Generation Of A Scenic Image By Tacking Multiple Images

G R Suma [1]**,** ***Dr. V.Venkatesh*** [2]

[1]P.G. Student, Department of Electronic and Communication Engineering, Channabasaveshwara Institute of Technology, Gubbi,Tumkur,Karnataka

(Sumaraj6@gmail.com)

[2]Principal, Department of Electronic and Communication Engineering, Channabasaveshwara Institute of Technology,Gubbi, Tumkur,Karnataka

(vvenkatesh_vve@yahoo.co.in)

ABSTRACT: ***Image tacking is the process performed to generate one scenic image from a series of smaller, overlapping images. The quality of image stitching is measured by the similarity of the stitched image to each of the input images, and by the visibility of the cease between the stitched scenic images. Image processing techniques involved with treating the image as a two-dimensional signal and applying standard signal processing techniques to it. Image tacking presents different stages to render two or more overlapping images into a ceaseless stitched image. Scale Invariant Feature Transform (SIFT) algorithm is applied to perform the detection and matching control points step and Random Sample Consensus (RANSAC) algorithm is a general parameter estimation approach designed to find the best matching points are used In this process .***

Keywords: Ceaseless Stitched scenic Image, Blending.

1. Introduction

Generating full view scenic images is important for both commercial and artistic value. Since the photography of many specific devices have been invented to create scenic images but with the availability of inexpensive digital camera. This research goal is to create a Matlab script that will stitch two images together to create one larger photograhic image. Given a sequence of images taken from a single point in space, but with varying orientations, it is possible to map the images into a common reference frame and create a perfectly aligned larger photograph with a wider field of view. This is normally referred to as scenic image tacking. Scenic image tacking has an extensive research literature and several commercial applications. The stitched image should not break existing or create new salient structures. Where the edge of the tower is broken in the overlapped region due to structure misalignment, causing obvious ghosting artifact. Intensity alignment .Human eyes are sensitive to large intensity change. Unbalanced contrast beyond the overlapped area of a stitched image can be perceptually magnified. Although the structure is well aligned and color transition is smooth within the overlapped area, the unnatural color transition from left to right reveals the unmatched intensities inherent in the input images. The context information of objects in the input images should be taken into account during the tacking process.

2. Contextualization

2.1 Existing System

Due to the limited Field-Of-View (FOV) of a certain camera [1], it is sometimes need to extend this FOV using heaped up cameras. Image tacking is one of the methods that can be used to exploit and remove the redundancy created by the overlapping FOV. Most of the existing methods of image tacking either produce a ‘rough’ stitch that cannot deal with common features such as vessels, cells and so on, or they require some user input. Approaches for image tacking that optimize the search for the best correlation point by using Levenberg-Marquardt method. Levenberg-Marquardt method gives good results, but it is quite expensive and can get stuck at local minima. The approach offered in this paper makes the selection of the best correlation point in the following way. Based on knowledge about the expected overlap when using the motorized stage, it would be case [2]. However, the overlap area is not perfect, and not accuracy for such an extent, due to deviations in stage position from the ideal and due to stage/camera misalignment way to overcome this problem by searching the small area around the expected central overlap pixel in order to find the best interrelation point. Lading of acquired images with a manual stage is much less accurate, so there is a need to search a wider area in order to find the best cross-correlation point.

2.2 Proposed System

Image processing is divided into two major branches; image enhancement and image restoration. Image enhancement improves the quality of image and to produce image that is different from the original. Whereas image restoration recovers back to the original image after degraded by known effects s. Image processing does not reduce the amount of data present but rearranges it.

Spatial filtering: An image can be filtered to remove a band of spatial frequencies, such as high and low frequencies. Where the transitions of brightness are established in high frequencies and the establishment of slowly changing brightness transitions in low frequencies. The acmatic frequencies normally will be found at the sharp edges or points. Spatial filtering operations include high pass, low pass and edge detection filters. High pass filters accentuate the high frequency details of image and attenuate the low frequency, creats a sharpen effect.

Sharpening: The main aim in image sharpening is to highlight fine detail in the image, or to worsen details of an image that has been blurred due to noise effects. Sharpening emphasizes edges in the image and makes them easier to see and recognize.The nature of sharpening is influenced by the blurring radius used. In addition to that, differences between each pixel and its neigbour too, can influence sharpening effect. The visual effect of a low pass filter is image blurring. This is because the sharp brightness transitions had been attenuated to small brightness transitions. It have less detail and blurry. Blurring can be done in spatial domain by pixel averaging in a neighbor. Blurring is aimed to diminish the effects of camera noise, unauthentic pixel values. The blurring effect can improve an image’s low frequency details by removing visually disruptive high antinode patterns. By the subtraction of a low pass amplitude image from the original image, creats a a sharpened image. This operation is known as unsharp masking enhancement.

Blurring : The visual effect of a low pass filter is image blurring. This is because the sharp brightness transitions had been attenuated to small brightness transitions. It have less detail and blurry. Blurring can be done in spatial domain by pixel averaging in a neighbor. Blurring is aimed to diminish the effects of camera noise.The effect of blurring can improve an image’s low antinode details by removing visually disruptive high frequency patterns.

Edge detection: Edges are often used in image analysis for finding region boundaries. They are pixels where brightness changes abruptly. An edge distinguishes between two apparently different regions. Edge detection of an image reduces significantly the amount of data and filters out information.

3. Steps For Image Tacking:

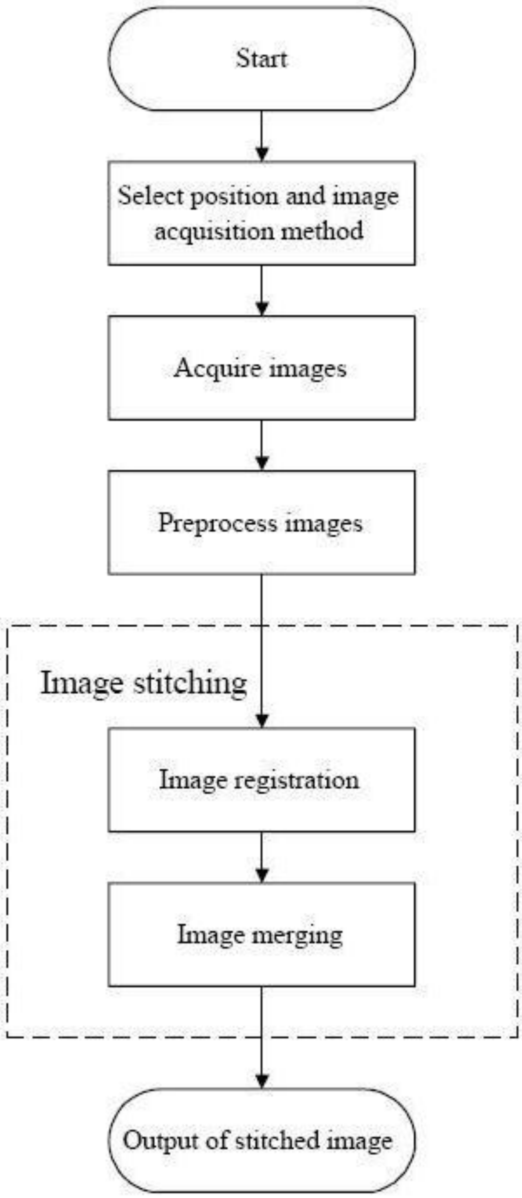


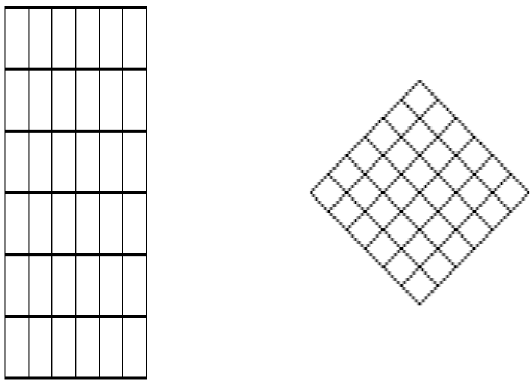
Figure 1:Flow diagram of image tacking.

The 3 important stages in the process of tacking images are:

1. Image Acquisition: The images that need to be stitched are acquired using a camera mounted on a tripod stand. The camera angle is varied to take different overlapping sample images

2. Image Registration: Image Registration is an important part of image restoration that use object criteria and prior knowledge to improve pictures. The process of image registration aims to find the translations to align two or more overlapping images such that the projection from the view point through any position in the aligned images into the 3D world is unique. This method processes distorted images the pixels of which are shifted from their nominal place. Another alterpiece of the same boggle taken from a different camera position often serves as a control image. This situation is very common in the remote sensing where image registration method helps to find the corresponding points in two images of the same region taken from the different viewing angles.

2.1 Image Registration Principle: The goal of image registration is removing of image distortion according to some prior information. The pixels in the incoming distorted image are shifted from their correct position caused by various acceptables. The basis for belief of making only the planar archery of three dimensional objects or various viewers' positions belongs to the most common causes of distortion. Figure 2 shows an example of the image distortion caused by various points of view. (a) Image of Carthesian grid viewed from the direction of z-axis. (b) The



(a) (b)

Figure 2: An example of the image distortion caused by various points of view. (a) Image of Carthesian grid viewed from the direction of z-axis. (b) The same grid distorted with selection of another viewer position. constitute a basic mathematical tool for mapping receiving distorted image into correct system. The prior information about proper positions of pixels is often given by another (base) picture of the same scene taken from the different ace of angle.

3. Methodology

There are two main algorithms which are as follows:

1.Scale Invariant Feature Transform Algorithm.

2. Random Sample Consensus (RANSAC) Algorithm.

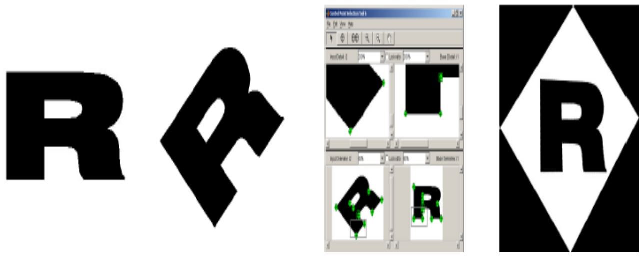
3.1 Scale Invariant Feature Transform Algorithm (SIFT):

Algorithms for image taching are some of the oldest problems in computer vision [3] . The goal of this is to take

same grid distorted with selection of another viewer position.The spatial transformations

An example of image registration is shown in Figure3.

.



(a) (b) (c) (d)

Figure 3: An example of image registration presenting (a) original image serving as a prototype image used as the base image in the registration process, (b) distorted image exported from 3D drawing system in similar way as the base image, (c) selection of control points in the Matlab system, (d) resulting image after registration .

3. Image Merging: The process of adjusting the values of pixels in two registered images known as Image merging. It should also ensure that the new image has a quality comparable to that of the original images which have been used. Image merging can be carried out by making the cease invisible in the output image. The cease is the line that is visible at the point where the two images overlap.

several overlapping pictures of a scene and then let the computer determine the best way to combine them into a single image.

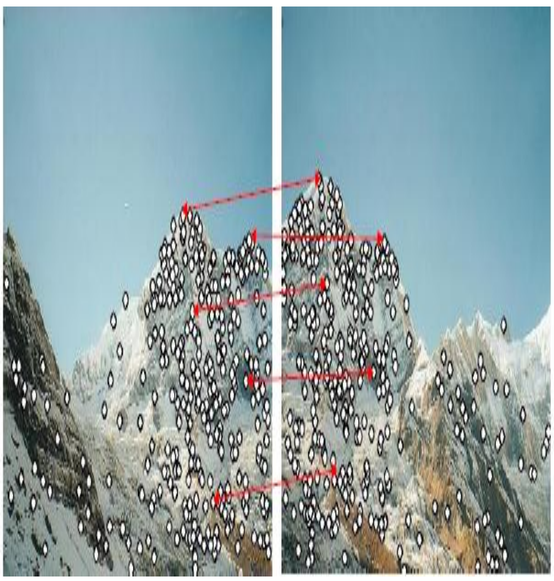
The Process involved are as shown below :

1. Collect a set of overlapping images.
2. Choose a reference image.

3. For each image “x”:
i. Find feature matches between reference and x.
ii. Determine transform from x to reference.
iii. Transform x and place both on composite surface.
iv. Composite becomes new reference.
4. Run algorithms required

SIFT :Scale Invariant Feature Transform Algorithm.

•It finds and matches the features [4] between the two images that are overlapping in nature.
• Works very well even under rotation and scaling changes between images
• Approach:
–Constructing a scale space of two images: progressively blur images with a Gaussian images.
– Take difference between images (DoG)
– Find the local extrema in this scale space Choose keypoints (dependent on specified threshold)
– For each keypoint create a 16x16 window and find histograms of gradient directions.
– Combine these into a feature vector (128 dimensions)
– Implemented with Matlab coding.



[3] i.e the minimum number of points in the image are randomly picked up for each proposition in the process.

Figure 4:SIFT features are extracted and matched between the images.

3.2 Random Sample Consensus (RANSAC) Algorithm:
RANSAC is an abbreviation for random sample consensus. Thus as the name sugeest radical subset.

.
RANSAC Algorithm:
1. Select random sample of minimum required size to fit model
2. Compute a putative model from sample set
3. Compute the set of inliers to this model from whole data set
4.Repeat 1-3 until model with the most inliers over all samples is found.

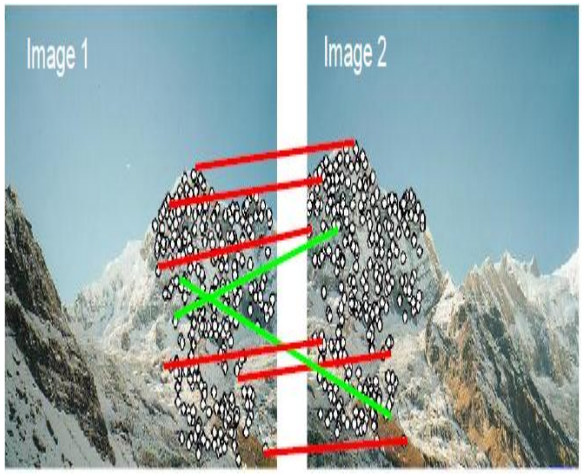


Figure 5: RANSAC is performed to compute the homography, then a probabilistic model is invoked to verify the image match based on the number of inliers.
Matches:Red: good matches,Green: bad matches

4. Preliminary Results

Figure 5: Two geometrically misaligned images stitched using MATLAB.

In this paper, we have proposed a novel image stitching approach by image deformation, where the overlapped regions may contain significant intensity inconsistency and geometrical misalignment. The below figure depicts two geometrically misaligned images stitched in a panorama using MATLAB.

5. Conclusion

In this research paper, we have proposed a novel image-matching algorithm. The first is simple and reliable algorithms for extracting and matching SIFT features and the second algorithm is used for fitting a model to data with outliers. Our algorithm can significantly increase the number of matching pairs, and matching accuracy. Extensive experimental results show that our method improves the traditional detectors, even in large variations, and the new indicators are distinctive. The image stitcher provides a cost effective and flexible alternative to acquire panoramic images using a panoramic camera. The panoramic images stitched by a stitcher can also be used in applications where the camera is unable to obtain a full view of the object of interest. The full view of the object can be constructed using the image stitcher using overlapping regional images acquired for the object.

6. References

[1] Tejasha Patil, Shweta Mishra ,Poorva Chaudhari , Shalaka Khandale, IMAGE STITCHING USING MATLAB, International Journal of Engineering Trends and Technology- Volume4Issue3- 2013.

[2] J. M. Morel and G. Yu, "Asift: A new framework for fully affine invariant image comparison," SIAM J. Imag. Sci., vol. 2, no. 2, pp. 438–469, Apr. 2009.

[3] http://en.wikipedia.org/wiki/Image_stitching.

[4] D.G. Lowe, Distinctive image features from scale-invariant keypoints, IJCV' 04.