Image Mosaicing

[1]Darshan Jethawa, [2]Kulakarni Prathamesh
[1,2]K J Somaiya Institute of Engineering & IT, Sion, Mumbai, Maharashtra, India.
[1]darshan.j@somaiya.edu, [2]prathamesh.k@somaiya.edu

Abstract : **Mosaicing is blending together of several arbitrarily shaped images to form one large radio metrically balanced image so that the boundaries between the original images are not seen. Any number of geocoded images can be blended together along user-specified cut lines. These techniques can be used to build environments and 3-D models for virtual reality application based on recreating a true scene, i.e., tele-reality applications. The fundamental technique used in this project is image mosaicing, i.e. the automatic alignment of multiple images into larger aggregates which are then used to represent portions of a 3-D scene.**

Keywords — Mosaicing, ransac, sift, featured pixel.

I. Introduction

Many a time, it may not be possible to capture the complete image of a large document in a single exposure as most image-capturing media work with documents of definite size In such cases, the document has to be scanned part by part producing split images. Thus, document image analysis and processing require mosaicing of the split images to obtain a complete final image of the document. Hence, document image mosaicing is the process of merging split images that are obtained by scanning different parts of single large document image with some sort of overlapping region (OR) to produce a single and complete image of the document.Image Mosaicing is mixing together of a few subjectively molded pictures to structure one substantial radiometrically adjusted picture so that the limits between the first pictures are not seen. Any number of geocoded pictures can be mixed together along client determined cut lines. These methods can be utilized to construct situations and 3-D models for virtual reality application focused around reproducing a genuine scene, i.e., tele-reality applications.

Image mosaicing not just permit you to make an expansive field of perspective utilizing ordinary cam, the result picture can likewise be utilized for composition mapping of a 3d environment such that clients can see the encompassing scene with genuine pictures.

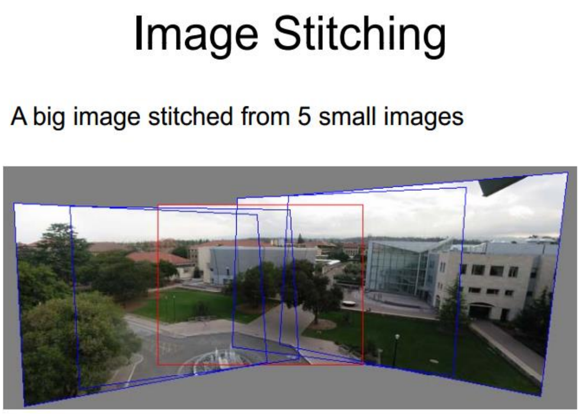


Fig 1: Image stitching

II. LITERATURE SURVEYED

Image processing of larger resolutions and dimensions isn't possible due to limited dimension scope. The entire scene is broken into parts of images and then processed and analyzed. This may include more errors. Time consuming task due to processing and analyzing of individual images. Mosaiced image will have 4 parts of the images stitched together so a larger scope and view. Processing of image needs to be done only once since the n numbers of images are stitched into one single mosaiced image. Fast process since the processing of image needs to be done only with the final mosaiced image

III. SCOPE OF PROJECT

Image mosaicing and stabilization can be applied to many areas of industry, such as: surveillance, mapping, maintenance and inspection..Geographic image mapping, satellite imaging and positioning. Retrieving documents by performing mosaicing and stitching operations. Creating virtual imagery and panoramic views. automatic 3D digital image metrology automatic tracking (video surveillance, quality control, etc.) imaging of full objects (built incrementally by moving a camera).image stabilization and correction quality control (e.g. 3D pose estimation, object alignment, offset displacement).

IV. METHODOLOGY, TECHNIQUES AND ALGORITHMS

4.1 Image Mosaic Procedure

Basic Procedure

Capture a sequence of images of the entire window of landscape that you wish to mosaic together..Shift the camera position by the same distance as that of the image width or height when capturing corresponding adjacent snapshots horizontally or vertically. Compute transformation between second image and first. Transform the second image to overlap with the first. Blend the two together to create a mosaic. If there are more images, repeat

4.2 ALGORITHM

4.2.1 Scale invariant featured transform

SIFT is an algorithm in computer vision to detect and describe local features in images. For any object in an image, interesting points on the object can be extracted to provide a "feature description" of the object. This description, extracted from a training image, can then be used to identify the object when attempting to locate the object in a test image containing many other objects. To perform reliable recognition, it is important that the features extracted from the training image be detectable even under changes in image scale, noise and illumination. Such points usually lie on high-contrast regions of the image, such as object edges. Applications include object recognition, robotic mapping and navigation, image stitching, 3D modeling, gesture recognition, video tracking, individual identification of wildlife and match moving.

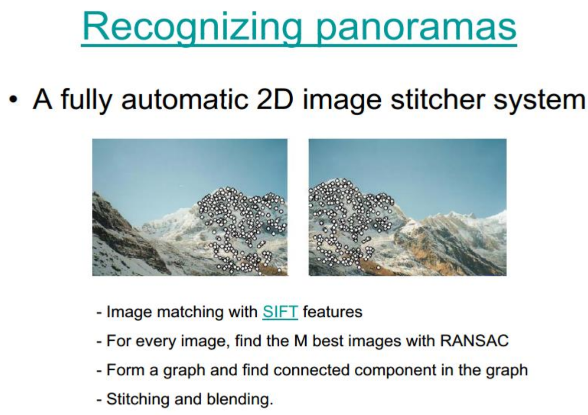
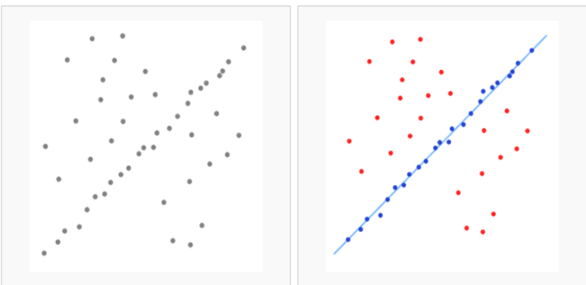


Figure 2:SIFT Algorithm

4.2.2 RANSAC

RANSAC is an abbreviation for "RANdom SAmple Consensus". It is an iterative method to estimate parameters of a mathematical model from a set of observed data which contains outliers. It is a non-deterministic algorithm in the sense that it produces a reasonable result only with a certain probability, with this probability increasing as more iterations are allowed. A simple example is fitting of a line in two dimensions to a set of observations. Assuming that this set contains both inliers, i.e., points which approximately can be fitted to a line, and outliers, points which cannot be fitted to this line, a simple least squares method for line fitting will generally produce a line with a bad fit to the inliers. The reason is that it is optimally fitted to all points, including the outliers. RANSAC, on the other hand, can produce a model which is only computed from the inliers, provided that the probability of choosing only inliers in the selection of data is sufficiently high.



A data set with many outliers for which a line has to be fitted.

Fitted line with RANSAC; outliers have no influence on the result.

figure 3: RANSAC Algorithm

V. DESIGN DETAILS

5.1 Image load/Capture module

This module empowers user to load a current picture into the software. It additionally empowers client to catch the picture at that exact second utilizing the product in this manner giving more adaptability. Numerous pictures to be mosaiced/ sewed together can be all the while stacked or caught through this module.

5.2 Image Mosaic module

After the images are loaded via the image load/capture module they are visible in the software display section. The image mosaic module then works on the stitching of the image by applying the image mosacing algorithm. After processing the mosacing the final image output is then showcased in the image display section of the software.

5.3 Image Processing module

This module applies standard image processing filters such as image brightness, image contrast, image grayscale, image rotate, image zoom and image invert.The processing modules ask for user to decide which filter to apply to the image.

5.4 Image Storage module

This module lets users to store the processing image into database backend. Also enables user to retrieve previously stored processed images for future reference.

VI. CONCLUSION

In this way mosaicing enables the client to capture various picture utilizing diverse sources like cam ,webcams and so on and to join them together utilizing different algorithms and therefore keeping up its solidness

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