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Reconstruction of Fragmented Images Using Color and Contour

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Abstract - *Proposed method studies the restoration of fragmented 2D digital photos. Automatic reconstruction of image fragments will facilitate several tasks in anthropology, forensics, and digital media. We tend to propose Associate in Nursing integrated rule for this necessary however difficult drawback. Our rule initial determines the nearness relationship among fragments, then effectively matches sub items and refines the reconstruction iteratively. The reconstruction of fragments to reconstruct pictures and objects may be a drawback usually encountered in many applications, starting from archaeology to medicines. During this method we tend to gift a completely unique methodology for reassembling 2D fragments. The planned methodology relies on the knowledge extracted from the outlines and from the color contents of the fragments, while not counting on any data of the ultimate image. The techniques illustrated during this paper represent the core of a more of general methodology for reassembling n fragments we tend to a developing. However, here we tend to concentrate principally on the outline of the algorithms for matching 2D and on their experimental analysis and validation.*

Key Words*: *Fragmented Image Restoration; Histogram-guided Fragment Matching; Contour-guided Fragment Matching.

1.INTRODUCTION

The proposed project creates comprehensive answer for obtaining data that is meaningful and applicable from the fragmented pictures or items of papers. From the projected answer the restoration of fragmented 2D photos is feasible. Automatic reconstruction of image fragments will facilitate several tasks in archaeology, forensics, and digital media. Propose rule 1st determines the contiguity relationship among fragments, then effectively matches sub items and refines the reconstruction iteratively.

Currently now-a-days there's no system for reconstruction of fragmented pictures. We tend to area unit reaching to propose system which will reconstruct the distributed components of the image to urge an entire image. The system can find the adjacent fragments of the image with the assistance of color and counter of the image i.e. Color and form of the image. The system are going to be ready to reconstruct close to concerning 6-7 fragments of the distributed image to make an entire image.

The problem of reassembling image fragments arises in several scientific fields like forensics and archeology. The manual execution of reconstruction is incredibly tough because it needs large amount of your time, talent and energy. Therefore the automation of such a piece is incredibly necessary and may result in a lot of economical, vital reduction in human effort concerned. In our work, the machine-driven reconstruction of pictures from fragments follows a four step model.

The first step of our approach is the identification of probable adjacent image fragments, so as to scale back the procedure burden of the following steps. There, many color based mostly techniques area unit used. This step can turn out higher performance. The second step is that the identification of the matching contour segments of the image fragments. The corresponding step employs a neural based mostly color quantization approach for the illustration of the image contours, followed by a dynamic programming technique that identifies their matching image contour segments. Once the matching contour segments area unit known, a 3rd operation takes place. Here, the geometrical transformation, that best aligns 2 fragment contours on their matching segments, is found. A really fashionable registration technique is that the repetitious highest purpose

(ICP) is employed to limit the results of noise. Here during this module we tend to area unit proposing a brand new approach of form alignment methodology supported the Fourier constant. The last step in resolution the fragment reconstruction drawback is that the reconstruction of the general image from its constituent fragments. Here, a unique rule is projected. it's clear that it's essential that every step of the rule feeds future one with correct results; otherwise the image reconstruction could contain errors, or could even fail fully. Our goal is to analyze and propose the foremost strong techniques so as to supply correct results at every intermediate step.

The main steps are as follows:

1) Discovery of spatial adjacent image fragments
2) Discovery of matching contour segments of adjacent image fragments
3) Image fragments contour alignment
4) Overall image assembly

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2. System Architechture

- **Input:**

  Input to the system will be the number of fragments of image any paper which can be founded in any historical departments or can be founded in crime branch. Image could be much old and the data which is on paper or on image can't be readable due to its broken. So that fragments of image or paper will be the input.

- **Texture Guided Fragment Adjacency Discovery:**

  Using the color or texture property to describe images is widely studied and demonstrated effective in content-based image retrieval. The main reason is that color often directly related to object or scene in the image. In addition, compared to the other visual features, color features have smaller dependence on the size, the direction and the perspective of the image. In this step, firstly we choose a suitable color space to describe color characteristics. We use the HSV model, where the H, S, and V stand for Hue, Saturation, and Value, respectively. The HSV system is closer to people's experience and color perception than RGB. We divide each of H, S, V range into 12 intervals, so the image color is quantified into 36 colors. We use a color histogram H to describe the image fragment.

- **Contour Guided Fragment Adjacency Discovery:**

  We further use the geometric contours of fragments to refine the adjacency detection. We need to first extract the image fragment's contour from the white background. This can be done through image binarization, whose accuracy dictates the accuracy of contour extraction. Here we used the OTSU algorithm. The OTSU is an adaptive threshold value method. According to the image gray characteristics, the image is divided into background and target. This method can automatically find the best segmentation threshold to separate the image fragment from the background.

  The number of pixels with gray value i is n_i where the gray value has the range [0,L -1].

- **Final Fragment Composition:**

When the above process will be conducted after that number of fragments will take their position according to their corresponding shapes on the basis of color and contour.

- **Output:**

Output of this system will be the reconstruction of image fragments with best accuracy. When the process of Texture Guided Fragment Adjacency Discovery and Contour Guided Fragment Adjacency Discovery will be done after that number of fragments will take their original position due to that we will able to find the meaningful information and appropriate data.

The preprocessing step is the digital acquisition of image fragments. Image fragments could be scanned consistently in to digital pictures. In our experiment, we also try the acquisition simply using a digital camera. To ensure the consistency of scaling for image fragments, the camera is fixed and is perpendicular to the image. Then with these fragmented image pieces, first, we discover their adjacency using the image color information, which we can also call texture information. This texture/color information can provide an efficient but not fully reliable suggestion. Hence, the result of this step is used as an initial guess for the next step, contour-guided discovery of adjacent image fragments. In this step, we first extract fragment contours, then detect the inflection points on the contour and divide the contour into several segments, finally match the segment sequences of all potentially adjacent fragments.

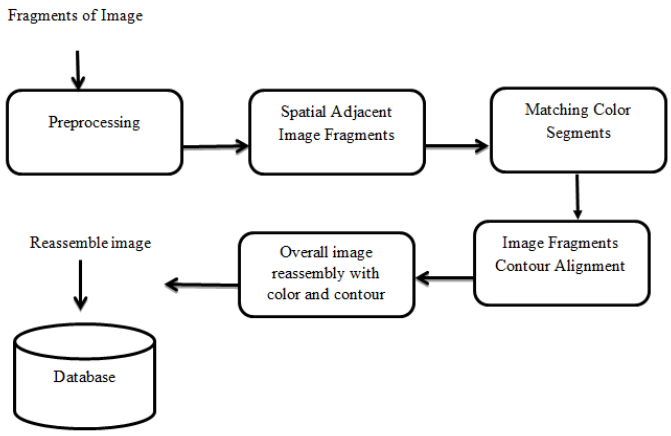

Fig. System Architecture of Reconstruction of Fragmented Images Using Color and Contour

3. CONCLUSIONS

We have presented an effective integrated algorithm to detect adjacent image fragments using color and contour. We describe reconstruction of fragmented images using color and contour. We generated the proper relevant result to through the system. We have presented the operation in the various image formats such as png and bmp. We provide to present the relevant information to the user.

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