

Proposed Technique for Edge Matching of Torn Paper

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Abstract— Corner distance matching Technique is proposed, which find the interest of points of every rived pieces. Any corner detector can be used window for finding where the intensity value is change most and mark that point as a corner. Points of interest are found and then for matching them distance between them is calculated. Distance can be matched and based on that it can be found that which two edges are of piece are matching.

Keywords-Torn paper, matching, rived paper

I. INTRODUCTION

For Edge matching of torn paper is very crucial area in forensic science. Instruction manual reconstruction of a recovered set of rived documents can be a complicated and time-consuming task. For little size trouble one can often use any instruction manual “random search” strategy for speedily matching and recomposing the fragments. For larger scale trouble the human visual system in combination with our relatively small amount of short-term memory, limits our reconstruction capabilities. More specifically, the mathematical complexity is of the order $N(N-1)$ as N fragment swill needs to be matched to $N-1$ other fragments. Also, the physical space required for spreading out and examining the fragments can grow quickly and inhibit any efficient matching^[9].

Recovery of torn documents is a problem that often arises in archival study and investigation science. Documents may be ripped up by hand or shredded by a machine. In both cases, the automatic or semiautomatic reconstruction of the original document would alleviate the manual effort, which is difficult and time-consuming^[1]. Most document reconstruction problems can be solved in two steps, that is, first, finding an initial set of matching fragment pairs as candidate matches, which is the most time consuming part of the reconstruction, then resolving the ambiguity among these candidate matches to reconstruct the original document^[1].

II. RELATED RESEARCH

Image Feature matching^[3]: This Technique presents an image-based technique for shredded document reconstruction. Currently, most research on document recovery focuses on image feature exaction and analysis. In this work, presented a complete procedure to recover a shredded document. The problem is different from solving jigsaw puzzles since curved boundaries and colour information are not available. In two-stage reconstruction approach, image-based techniques are first used to identify the shred images with high spatial proximity and evaluate the similarity between any pair of shreds. A graph-based algorithm is then

used to derive the best shred sorting result for document reconstruction. Experiments are presented for both the synthetic and real datasets. After Image acquisition and pre-processing, special shred selection are done. After shred selection shred coding process are introduced. A shred coding scheme is proposed to group the closely related shreds. Then, in shredded document reconstruction, a similarity measure is a metric to evaluate the similarity between any two shreds. In this work, propose two approaches for the similarity measure computation. One is to use the discrepancy in the shred coding result, and the other is to calculate the correlation between the shreds based on the average word length.

Curve matching and Relaxation Process ^[1] : One of the most crucial steps for automatically reconstructing Rived documents is to find a globally consistent solution from the ambiguous candidate matches. In this technique propose a global approach for reconstructing Rived documents by first finding candidate matches from document fragments using curve matching and then disambiguating these candidates through a relaxation process to reconstruct the original document. The candidate disambiguation problem is formulated in a relaxation scheme, in which the definition of compatibility between neighboring matches is proposed, and global consistency is defined as the global criterion. . Initially, global match confidences are assigned to each of the candidate matches. After that, the overall local relationships among neighboring matches are evaluated by computing their global consistency. Then, these confidences are iteratively updated using the gradient projection method to maximize the criterion. This leads to a globally consistent solution and, thus, provides a sound document reconstruction. The overall performance of this approach in several practical experiments is illustrated. The results indicate that the reconstruction of Rived documents up to 50 pieces is possibly accomplished automatically. Experimental results demonstrate the possibility of automatically reconstructing Rived documents by using the relationships among the candidate matches to reduce or even eliminate the ambiguity resulting from the local curve matching. It's indicate that the reconstruction process would benefit greatly from the user interactions, which make it possible to reconstruct documents from a large number of fragments semi-automatically in an efficient human-aided way.

Reconstruction of shredded document using feature matching ^[8]: Reconstructing documents that have been shredded by hand, a difficulty that often arises in forensics. The above method first applies a polygonal approximation in order to reduce the complexity of the boundaries and then extracts relevant features of the polygon to carry out the local reconstruction. In this way, the overall complexity can be dramatically reduced because few features are used to perform the matching. The ambiguities resulting from the local reconstruction are resolved and the pieces are merged together as search for a global solution. The preliminary results reported in this technique, which take into account a limited amount of shredded pieces (10–15), demonstrate that feature-matching based procedure produces interesting results for the problem of document reconstruction. In this technique, proposed a methodology for document reconstruction based on feature matching. It takes two steps where the former makes an approximation in order to reduce the complexity of the boundaries and overcome specific problems faced in document reconstruction and the latter extracts relevant features of the polygon and uses them to make the local reconstruction. The performance drops as the number of fragments gets bigger due to the scale used during the polygonal approximation. This issue can be addressed by choosing the most important aspects for the application, i.e. reducing complexity or improving performance. It is worth of remark that both views are important. A less complex system, like the one presented here,

could be applied initially and then a more complex one, hence more time consuming, could be applied to resolve final confusions.

Contour maps [11]: Efficient and successful joining of Rived pieces of papers to reconstruct the original documents is an important and challenging issue in many disciplines, especially in forensics and investigation sciences. Automation of the process by means of appropriate techniques can speed up the problem solving substantially. With this technique a fast, efficient, and useful for the reconstruction of hand- Rived Pages of documents from their images, using contour descriptors for shape- based matching. Chain code of the closed digital arc representing a contour, and its Minkowski Sum; have been exploited in their reconstruction work. This work elucidates a novel technique for reconstruction of hand-Rived documents, exploiting the elegance of chain coded contours and their Minkowski Sums. For missing pieces and multiple documents Rived at a time, proper modifications have to be incorporated.

III. PROPOSED METHOD

Segmentation

All the torn pieces are scanned in one image. Using segmentation, these pieces can be separately identified. Any segmentation method can be used based on characteristics of torn paper. This segmentation will result into registration of each of the piece separately.

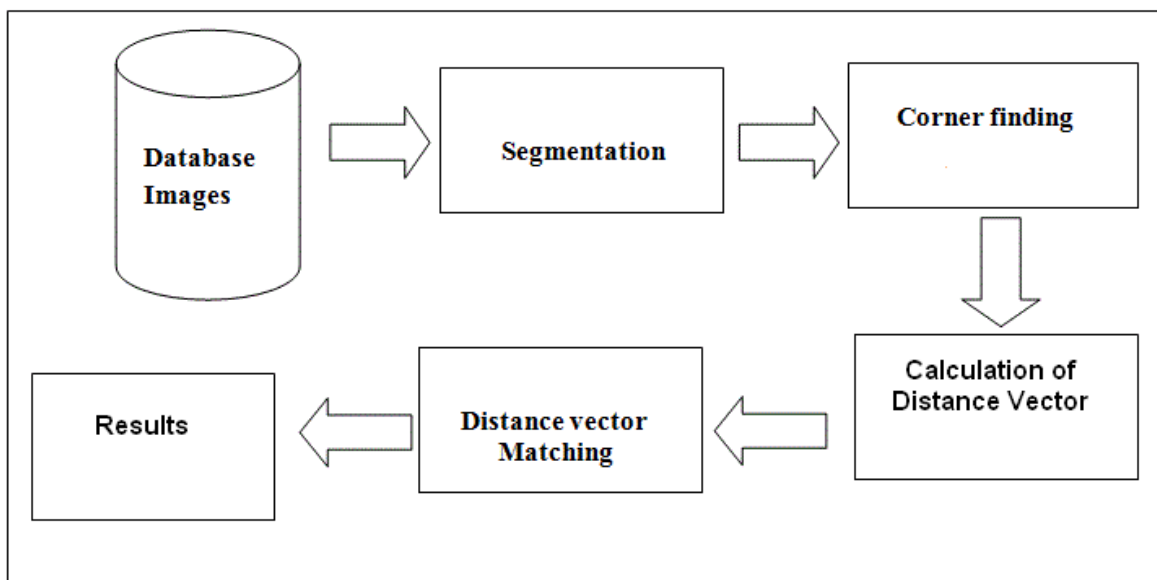


Figure 1 – Flow Edge Matching for Torn Paper

Corner Finding

After registering each piece separately, corner detection method is applied on each of the piece. This will give array of corners for each piece. Again any corner detection method can be applied but finding corner using canny edge detection may provide better results.

Calculation of Distance Vector

This is simply a distance calculation between two points. Two successive point of a piece are found out and then distance between them is calculated. This will give array of distance for each piece.

Distance Vector Matching

This is a simple value matching. Distance of different pieces are taken from their respective array of distance and compared. The best matching distance is taken as result. This is recursive procedure to find out best matching pieces.

IV. CONCLUSION

As seen above that this is a recursive procedure. Each piece distance is matched with each distance of every other piece. So complexity of the algorithm is high. But every solution is tried it gives best matching piece combination. Recursively it gives complete reconstruction of all torn pieces.

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