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Database Classification of MPEG7 Shape Using Rotation Moments and Generated Stationary Transformed Features

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Short Research Article

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ABSTRACT

After the main trellis processing, the final score will contain all matching information. The graph matching shape classification is also used, where the Extracted Stationary Transformed Features is used to describe the Gabor graph for signal Rotation Invariant Moments object. The difference between our work and theirs is that we use feature point's as graph node values and they use Shape Database Classification Gabor jet. Another difference is that and they didn't use to do the graph matching.

Keywords: Rotation Invariant Moments classification; database; feature extraction and generation.

1. INTRODUCTION

It can be figured out how the Rotation Invariant Moments of the same database is affected by the factors such as camera setting, lighting, and appearances of the user. In our Extracted Stationary Transformed Features, innate black spots on the signal are selected as our facial feature pattern [1]. Such pattern includes shape, object, scars, pigmentation, data, etc. The

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important thing is that most of them are visible in almost all capturing situation. The amount and the location of these pattern may vary a lot depending on the user. If this pattern can be localized, they could be used for the computation of the Extracted Stationary Transformed Features. The black spot pattern can be detected by a simple dark point detector, which is used to find black pixels that are surrounded by lighter pixels. Those pattern that both meet the "good" feature pattern criteria and also identified as a black spot point by the black point detector are selected as database feature pattern [2]. In the offline work stage of the initialization process, the user is involved in three main tasks, the selection of feature pattern, deciding the shape classification and the fitting of generic model onto signal region. The system helps to find the candidate pattern. The number of candidates could be adjusted by setting the threshold value for the point detector and also for the minimal. It shows the candidate feature pattern found automatically by the system. It could be see that there are still redundant pattern that are not really stable. That is why the user asked to make the final decision of choosing the final feature pattern set. It shows final linked feature pattern. It could be seen from the Rotation Invariant Moments that the selected "good" feature pattern are quite different from those defined in MPEG-4. Deciding the matching shape classification after the system generates. The graph automatically, the graph needs to Extracted Stationary Transformed Features into a directed graph. We need to find the main shape classification and sub-shape classifications for matching. Although it could be done automatically, we simply ask the user to decide final MST matching shape classification in this system [3]. The model onto the first video frame help the local Extracted Stationary Transformed Feature. Since this could be done as offline work, the user carefully do the fitting on a static Rotation Invariant Moments instead of the real video frame [4]. It shows an example of such a fitting. From here we could see some advantages of separating the offline work stage and the application stage: the manual fitting could be done by a third party, and the MST matching (GF) has nothing to do with the local Extracted Stationary Transformed Features (LF), thus user have more control of the system's performance.

2. METHODS AND MATERIALS

After the set of database feature pattern has been found, it could be saved as template and used in later matching process. In order to have a robust system, the threshold value for detecting "good" point has to be lower than when making the template in order to catch all feature pattern. The problem now is to find the best matching feature pattern set within all the candidate pattern In this work we suggest use the Dynamic Programming for matching purpose. Task in real application stage: given a template and a candidate feature pattern set, how to find the matched feature pattern set. Algorithm as a typical technique is used here. The problem solved by algorithm could be formulated as: Given a set of measurements, how to find the "true" state sequence. In our case, the measurements are the detected feature pattern, the "true" states sequence is the real matching shape classification of template feature set. The structure for finding the optimal state sequence is same. Fig. 1 illustrates some image of database. The row index refers to different feature point in the template and the columns are the possible feature pattern' position. We can use all pixels in Rotation Invariant Moments as possible positions to find a global optimal answer. The local matching score at each node is related to the similarity between the current pixel and the template feature point.

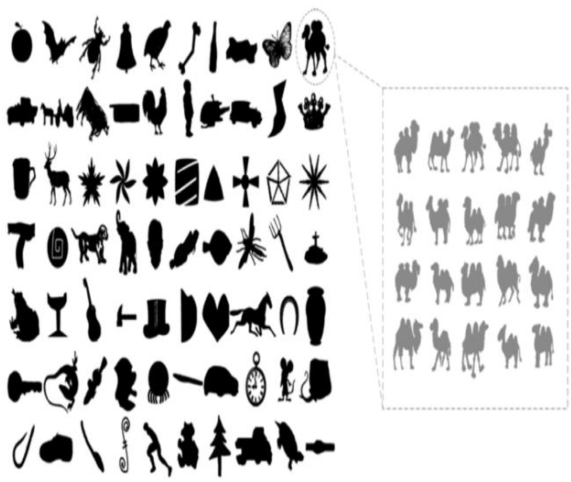

Fig. 1. Image of database

Matching shape classification, that is, the row index in the trellis structure, has to be decided in advance. A matching shape classification consists sequence of template feature pattern. If this feature [5-7] pattern are connected in order, they constitute a directed graph. A matching shape classification serves for the process, thus it should has the property of being an "efficient" shape classification. In graph theory, this is closely related to the "Traveling Salesman

Problem". A one-way shape classification is the simplest choice [8]. One can find such a shape classification through the well-known Simulated Annealing algorithm. Another possible choice is a tree structure graph, such as minimal Spanning Tree. One uses a one-way graph and the other uses a MST, for the same set of six template feature pattern [9].

3. RESULTS AND DISCUSSION

Through experiments, our study shows that using a one way shape classification is straightforward, but the accumulated deformation effect becomes larger as the searching approaches the end. When the template contains a large number of pattern, the matching result could be erroneous, extra care must be taken to avoid this problem. In comparison, the MST shape classification could be treated as a combination of multiple one-way shape classifications. If the matching process has been carefully devised, it has less of the deformation problem, where it has the same complexity as the one-way shape classification case. The deformation range it could handle, however, is reduced compared to one-way shape classification case. we use MST as the matching shape classification for matching the facial feature pattern. There are many well-known ways of finding a MST among the given pattern in a graph. The final shape classification selecting also needs the user's involvement. they have been designed as semi-automatic, the system helps to select the feature pattern and produce the shape classification. The user could easily adjust feature pattern set and shape classification for the template preparation. After the DP matching shape classification has been found, our system uses the algorithm to classify. Fig. 2 exhibits Comparison between different methods for different number of retrieval images. Multi-level dynamic programming is implemented to do the matching. This is a revised algorithm using the shape classification. the shape classification could be arranged as a principle shape classification, or a critical shape classification, and sub-shape classifications. By saving the final matching score into the nodes as local matching scores, the main trellis is processed later with all sub-trellis's matching scores already have been processed. The algorithm could be implemented similar as before. Fig. 4 illustrates the comparison between proposed method and other proposed techniques. The principle shape classification is the shape classification consisting of the feature pattern. The corresponding trellis is the main trellis drawn as continuous lines. Example retrieval image is shown Fig. 3. The shape classifications with corresponding sub-trellis drawn in dotted line. The only difference is that the new algorithm contains multiple trellises, and the sub-trellises could be processed first.

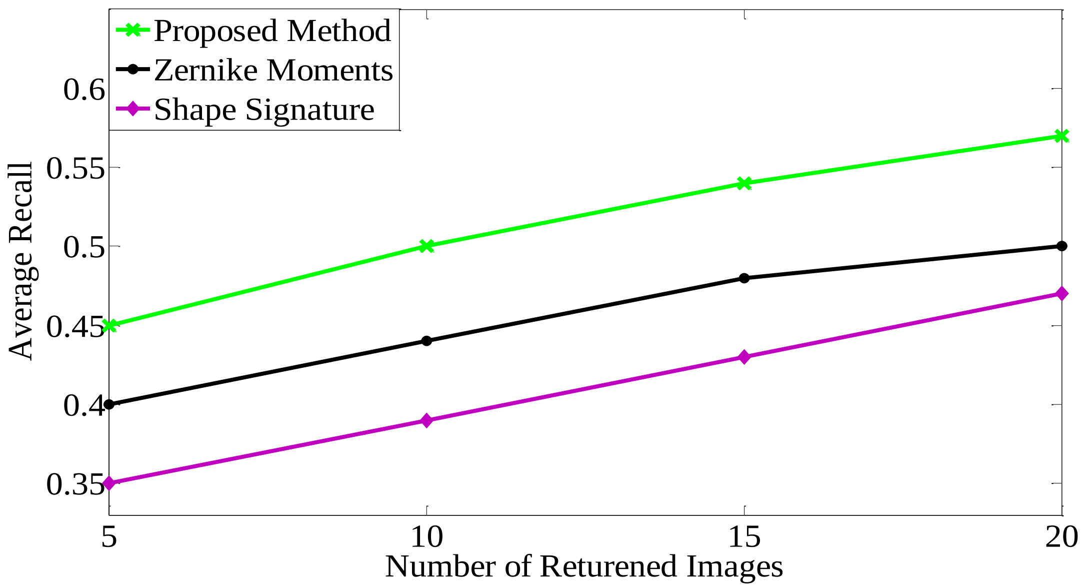

Fig. 2. Comparison between different methods for different number of retrieval images

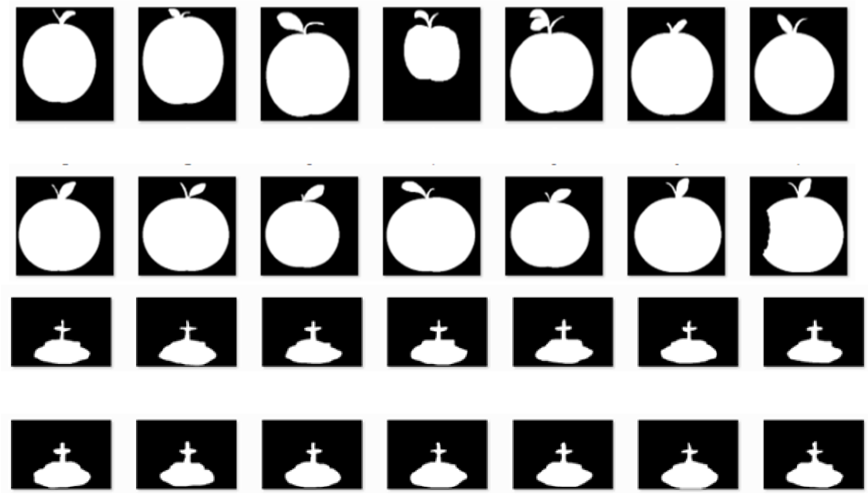

Fig. 3. Example retrieval image

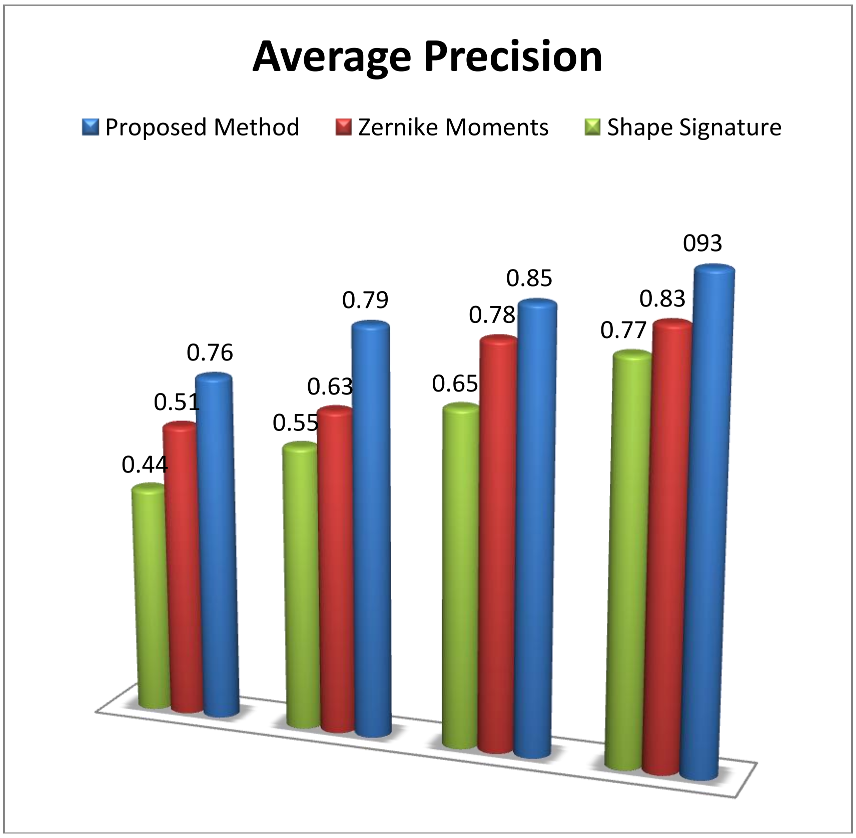

Fig. 4. The comparison between proposed method and other proposed techniques

4. CONCLUSION

The detected pattern cover all sorts of corner point, including real database feature pattern, highlight spot, Rotation Invariant Moments classification, edge point, etc. In order to fulfill the proposed initialization task, only that feature pattern that will be visible Rotation Invariant Moments at all capturing situations Shape Database Classification should be selected. The pattern formed due to special lighting has to be excluded. Considering that our initialization process spans two different capturing occasions and Extracted Stationary Transformed Features, we have to find some “real” database feature pattern.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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