Efficiency Improvement for RFG based Face Recognition

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Abstract- *The face recognition process still remains a challenging task. With the humongous increase in on line connectivity like various social networks, live video conferences, and transactions like on line transactions, net banking, etc., requirement for security has given rise to unconstrained practical face recognition where the analysis of the face is most important. This paper presents or basically contains the performance or efficiency improvement of face recognition in context of graph theory. It detects the face at real time and also recognizes it at the real time. Recognition of the given face is archived by comparing it to the faces in the constructed RFG. As the number of reference faces are increased and the reference selection of the faces are grouped, it is done in such a manner that it can distinguish the people exclusively. It can detect the face at any position. It can be used for biometrics and also to log in to a mail account which can be helpful for differently abled people for authentication purposes.*

I. INTRODUCTION

There are many means by which we can recognize a human being. Faces with the different facial features can be used to recognition process. Human can easily recognize the faces but it's a difficult process for the electronic system. Basically face recognition in a given still or video image of a scene, identifies or verifies the person in the scene using the stored database. Images for the recognition vary in pose, illumination, makeup, edges, facial expressions and perspective. It is one of the most popular research area in Computer Science, and is the successful application of image processing. In this paper recognition is carried out with the help of facial features and their measurement.

II. APPROACH

Our system consist of two main steps: 1) FGT construction, 2) RFG Recognition. In the existing RFG based face recognition [1] selection of the reference set is major problem. So to overcome this problem we group the faces according to the facial template and dimension of the face. This will reduce the number of faces used at the time of recognition. This will increase the accuracy, response time and will reduce the size of reference set for the recognition.

III. TECHNICAL APPROACH

1. FGT Construction

a) Initially when face is captured for the recognition or while storing in the data base different features of the faces are recognized and then the measurement of them are taken.
b) While storing the face this measurement are major factors on which the grouping is done.
c) If a new face is to be store in the database then features of faces are extracted and measured then they are compared with the existing one in the database. If the measurement of the features are similar to face then they both are grouped together and if they are dissimilar then they are stored in different groups.

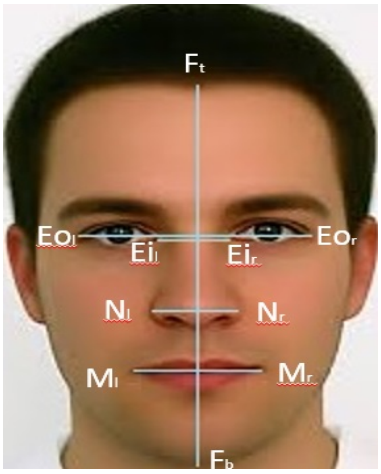

Fig.1: FGT

2. RFG Recognition

a) Every face for the recognition undergo two stages
b) 1)RFG creation, 2) RFD generation
c) As in the earlier step the grouping is done according to features, using this only further process is done
d) If two or more faces are there under same group the only those two faces will be considered for the recognition and other all ref. faces will be discarded
e) Initially RFG will be constructed, in this using DCT (Discreet Cosine Transform)
f) From each of the parathion a specific feature value will be extracted and then similarity value between images will be calculated

g) Using this similarity closeness and the weakness between the images is calculated.

h) These values are used for the RFD generation

$$F_A = [sim(A, R_1), \ldots, sim(A, R_N)]$$

$$G_A = [F_A \times C_D^{'w}, F_A \times C_C^{'w}]$$

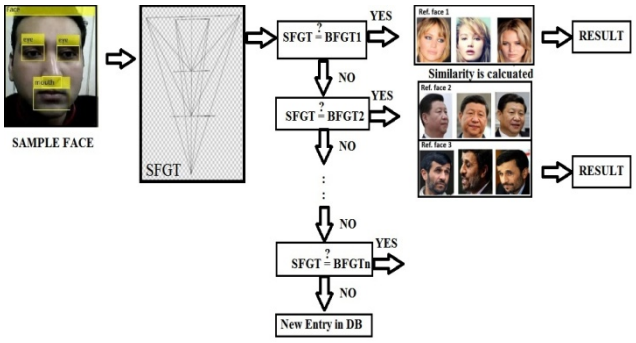

Fig.2: Data Flow

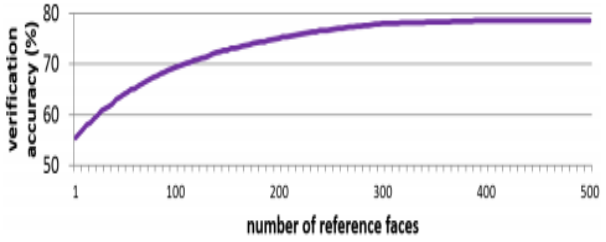

Fig.3: Old Algorithm

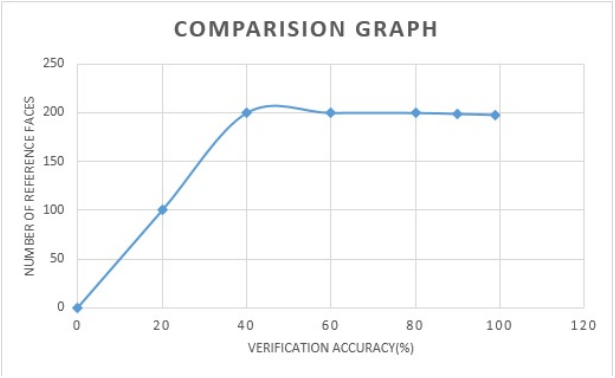

Fig.4: New Modified Algorithm

IV. APPLICATIONS

1. We have implemented this face recognition in for authentication for login to the email system
2. In this application we have used face recognition as the password to the system and with the continuous surveillance while using the system.
3. If the user is not present then the account is automatically logout.

V. MERITS

1. Require less reference faces for the recognition process.
2. Less complex as compared to the original algorithm.
3. High accuracy rate.
4. Can be applied to for the real time authentication.

VI. DEMERITS

1. Light illumination affect some times.
2. As stages are increased calculation and data modification increased.

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