

Multimodal Based Face Recognition

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ABSTRACT

Biometrics refers to a scientific discipline which involves automatic methods for recognizing people based on their physiological or behavioral characteristics. Biometric systems that use a single trait are called unimodal systems, whereas those that integrate two or more traits are referred to as multimodal biometric systems. A multimodal biometric system requires an integration scheme to fuse the information obtained from the individual modalities. In this paper, we have designed and developed a technique for multi-modal biometric recognition using feature level fusion. Initially we consider two data sets namely face and pattern. Using Eigen Faces we extract the features from the face and we will make use of N-Queens algorithm to determine a way in which a person thinks. This in turn will provide us with more security because the thinking pattern of every person is different.

Keywords: Face Recognition, Multimodal, Eigen Faces, Pattern, N-Queens, Usability, Security, Authentication.

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I. INTRODUCTION

A multimodal biometric system requires an integration scheme to fuse the information obtained from the individual modalities. In existing system, people have made use palm-print combined with face recognition for security purpose. It was effective but also there were many drawbacks of it. It was a time consuming process. And also we can fool the security system by making clone palms of the victim and also we can make a mask that resembles the victim's face. Hence, this process system is not that effective and not fully secured.

In this paper, we have designed and developed a technique for multimodal biometric recognition using feature level fusion. It will be a face recognition combined with pattern matching. Initially, we consider two data sets namely face recognition and pattern. Using Eigen Faces we extract the features from the face and we will make use of N-Queens algorithm to determine a way in which a person thinks. Biometric is the process of identifying of an individual in terms of their physiological and behavioural characteristics.

Face, hand, eye, ear, skin, odour, dental and DNA are the general physiological which we have used. Voice, gait, keystroke, signature, mouse movement and pulse are the general behavioural characteristics which we have used; two or more biometric can be merged to enhance the accuracy of recognition. Though time taken in multimodal system is more compared to unimodal systems, still it is used in the systems where security is the chief concern. By using appropriate normalization technique and fusion technique we can achieve a high level of security multimodal biometric system.

II. RELATED WORK

In [1] various issues related to multimodal biometric system have been presented. By combining multiple biometric traits, the performance of biometric system can be improved.

In [2] we learnt a technique for multi-modal biometric recognition using feature level fusion. The proposed technique is obtained with the help of evaluated with the performance metrics such as false acceptance rate, false

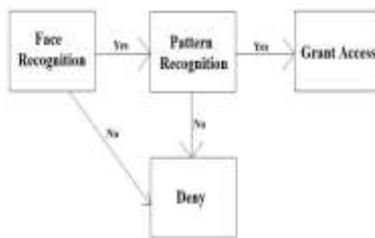
rejection rate and accuracy. Finally, the comparative analysis shows the proposed fusion technique provides 92% accuracy for both the equation such as $(A-B)+A$, $2*(A+B)$. This provide better results when compared to existing technique.

In [3] we survey known results for the n-queens problem of placing n non attacking queens on an nxn chessboard and consider extensions of the problem, e.g. other board topologies and dimensions. For all solution constructions, we either give the construction, an outline of it, or a reference. In our analysis of the modular board, we give a simple result for finding the intersections of diagonals.

In [4] We learnt an $O(f(n>8n))$ algorithm for the n-queens problem. There is some evidence that the number of solutions to the problem is super-exponential [8]. If this is true, then our algorithm is superior to any approach (such as backtracking) that explicitly constructs all solutions to the problem.

III. PROPOSED SYSTEM

The below figure explains the block diagram of the proposed system. The system consists of two modals. The first modal is the face recognition. The second modal is the pattern matching. Both these modals are combined and based on their outcome the access is grant or denied.



A. Face Recognition:

The face recognition modal is used to detect the face of the user. In this technique, various face recognition methods are used for face detection. These methods include face detection, face normalization and face identification. Face detection includes the technique of detecting the face from the body, or we can say that separating the face from the body. Face normalization includes the technique of adjusting the brightness, contrast, scaling, etc. of the face image. Face identification involves the technique of identifying the face. We also made use of Eigen faces algorithm for face detection technique.

A. Pattern Matching:

In pattern matching technique we will be matching the pattern using N-Queens problem. We will also make use of backtracking algorithm to solve N-Queens pattern. In N-Queens problem, a queen should be placed in such a way that it should not attack any other queen. This pattern will be provided to the user and if the user gives the input that matches the database, then we will grant that user the access.

In backtracking algorithm, if the user gives us an invalid input then it will backtrack and give the user one more chance to provide a valid input, otherwise it will deny the access.

IV. WORKING OF PROPOSED SYSTEM

This system contains a web page, the first is the home page of the system. The first step is the registration step of the system. In this step, the user is registered by providing all the details of himself. These details include name, address, etc. Then comes the face recognition part where the user has to provide it's face images. These images will get stored into the database. Then the second part is of pattern matching. The user is then provided with a N-Queens pattern and is told to solve the next step. These records have been stored in the database and during the login process they are used. Following are the step by step snap shots of working of this system.

GUI screens of the Web application:



Fig 1. Home page



Fig.2. Registration Page2



Fig.3. Registration Page3



Fig.4. Registration Page4



Fig. 5 Face Detection

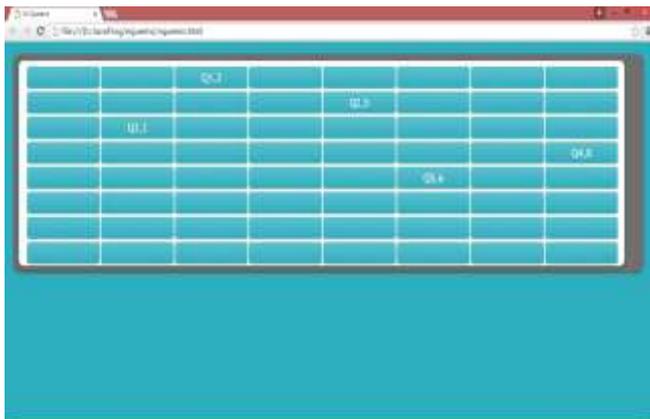


Fig. 6 Pattern Matching



Fig 7 Login Successful

V. CONCLUSION

In This Paper, We Have Presented A Technique For Multi-Modal Biometric Recognition Using Feature Level Fusion. Initially We Take Data Sets Namely Face And Pattern. Using

Eigen Faces We Extract The Features From The Face And The Pattern Features Are Extracted Directly Using N Queens. The Proposed Technique Is Obtained With The Help Of Evaluated With The Performance Metrics Such As False Acceptance Rate, False Rejection Rate And Accuracy. Finally, The Comparative Analysis Shows The Proposed Fusion Technique Provides 92% Accuracy For Both The Equation Such As $(A-B)+A$, $2*(A+B)$ This Provide Better Results When Compared To Existing Technique.

VI. FUTURE SCOPE

Face And Pattern Recognition Are Becoming One Of The Major Issues In Finding The Identity Of A Person. Quite A Lot Of Techniques Have Been Available For The Recognition Of Face And Pattern. In This Paper, We Have Developed An Efficient Technique For The Recognition Of Face And Pattern.

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