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**ABSTRACT**

The numbers of Smartphone users increasing day by day. Hence, there is need to propose advanced Group Policy based Authentication for incoming calls for Android phone. Android platform provides a variety of functions that support the programming of face recognition, as in image processing. Group policy based authentication scheme increases the security which restricts the access of incoming call form un-authorized user. To solve problems, related to face recognition should be applied in the practical and flexible devices like android device. In the display interface, android application is very interactive and easy to use by the user because it is the latest portable devices currently.

Android is one of the popular and mostly preferred operating systems for Smartphone's as an open source platform. Many Smartphone's have adopted this platform and more will do so in the future. The system can be used as the base for the development of android applications such as android mobile security application and as an archive for the recognition of human identity.

The processing power and the limited storage of the mobile device, limited network bandwidth and connection instability, privacy and are the difficulties that need to be solved.

**KEYWORDS:** Android Operating System, Face recognition, Incoming Calls, Authentication, Call Block, group policy.

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**INTRODUCTION**

As mobile phones are becoming increasingly powerful, security of the data stored in mobile phones like email addresses, sensitive documents, etc., becomes very important. Most of the current phones have password protection to address security. However, a face recognition scheme is much more secure and flexible as it provides distinctive print to gain access and also the user need not remember passwords. Traditional methods of confirming the identity of an unknown person rely either upon some secret knowledge (such as a PIN or password) or upon an object the person possesses (such as a key or card). While performing face recognition on mobile platform it does not only suffer from the same problems of a computer based system, such as illumination, occlusion and pose variations, but is also limited by other factors: Limited Processing Power, Limited Memory [1]. To implement face recognition based authentication for incoming calls on mobile, existing algorithms suffers from recognition time and Accuracy Tradeoff i.e. increasing robustness will increase the time of recognition.

To implement Real Time Recognition i.e. recognition must be performed within few seconds to support incoming call authentication and to make application robust under different illumination conditions. Based on the face recognition system described above, we propose an incoming call authentication application. The aim of the application is to restrict access of incoming call to unauthorized entity. Authentication of user is based on face recognition using group policy approach. The algorithm constitutes engine of a new face authentication for incoming call application. It restricts user to receive call unless proposed entity's face is not verified with registered entity's face image. An authentication method based on face recognition is designed for restricting access of incoming call for un-authorized entity. It will take the image of person (who wants to be registered as an authorized

entity) during the registration process, once the registration is complete, it will monitor the entity while call receiving. Therefore the user can not receive the call unless the application will grant him as an authorized entity. For this purpose application has to monitor the call status and as the call status goes to incoming call, application has to restrict the receiving of call and take a photo of claimed entity by the same camera of mobile on which the call is coming. Once the image is captured, it will go through the matching process between captured image and registered image, if the match is successful then call can be received by the entity, else call will be ended.

## LITERATURE SURVER

Mostly used methods for verifying the person identity of an unknown person rely on secret knowledge such as PIN or Password[7]. Biometrics is very convenient on frequently used mobile devices, but environment must also be considered. Biometric technology is capable to identify user identities through its unique features. To implement face recognition based authentication for incoming calls on mobile, existing algorithms suffers from recognition time and Accuracy Tradeoff i.e. increasing robustness will increase the time of recognition. Face recognition is a complex and difficult uses different algorithms to improve performance. Biometric technologies is widely studied and developed by the experts. The facial recognition stages are feature analysis, eigenfaces automatic face processing [2]. Some facial recognition software algorithms identify faces by extracting features from an image of a subjects face.

### Existing System

Existing authentication method based on face recognition the algorithm constitutes engine of a new face authentication for incoming call application. It restricts user to receive call unless proposed entity's face is not verified with registered entity's face image [6]. False Match is the system incorrectly declares a successful match between the input patterns in the database. False Non-match is the biometric system incorrectly declares failure of match between the input pattern and a matching pattern in the database. When incoming call is detected; application takes proposed entity's image and processes it to find the spatial histogram of image which is then used to find chi square value with registered image's histogram. If chi square value is less than threshold then call is received. The implementation is made for the Android platform, using OpenCV libraries for image processing [8]. Therefore the user can not receive the call unless the application will grant him as an authorized entity. The variations of the face image are caused by two factors. The first factor is variation on own face and second factor is the variation caused the object transformation of face into face image[4]. A feature extraction algorithm extracts features from the data. It creates those new features based on transformations or combinations of the original data. In other words, it transforms or combines the data in order to select a proper original feature.

Eigenface face recognition method can be classified in an appearance-based method, because the eigenface face recognition information is used for image identity [1]. In Eigenfaces approach the face images are decomposed into a small set of characteristic feature images called eigenfaces from the original training set of images by means of principal component analysis (PCA). An important feature of PCA is that any original image can be reconstructed from the training set by a linear combination of the eigenfaces. Each eigenface represents only certain features of the face. Eigenfaces can be minimized by choosing only the most important features (eigenfaces).

The eigenface approach involves the following initialization operations an initial set of images (training set) is acquired. Face Images are projected into a feature space that encodes the variation among known face images. The face space is defined by the "eigenfaces", which are the eigenvectors of the set of faces. At Initialization it acquires the training set and calculates eigenfaces (using PCA projections) which define eigenspace. When a new face is encountered, calculate its weight. Determine if the image is face. If yes, classify the weight pattern as known or unknown. If the same unknown face is seen several times incorporate it into known faces [3].

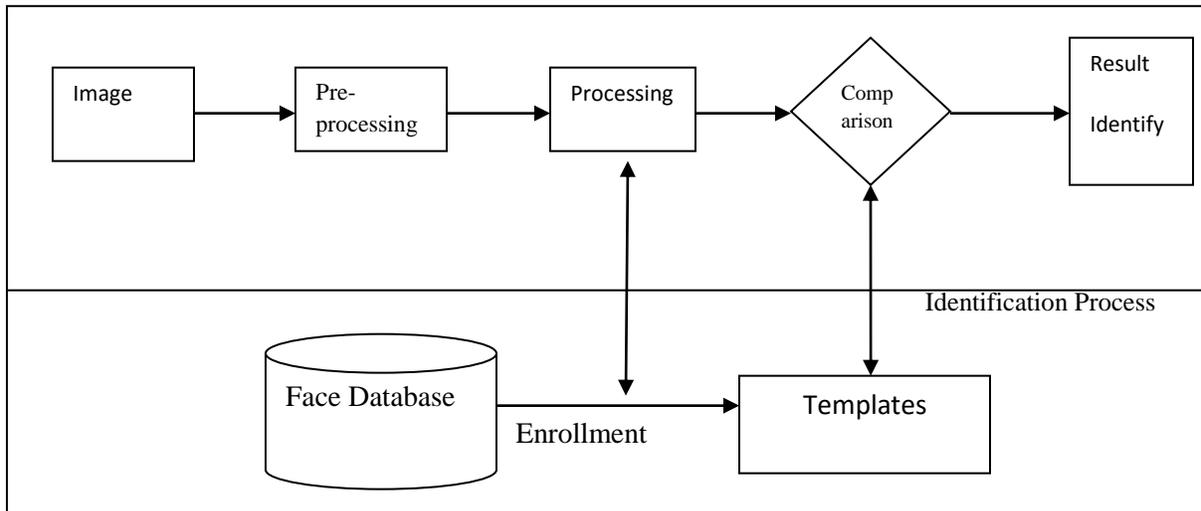
## PROBLEM STATEMENT

Existing algorithm suffers the problem of increasing the time of recognition. Different other factors affects are Processing Power, Limited Memory. The proposed system will reduce the recognition time by implementing Real Time Recognition i.e. recognition must be performed within few seconds to support incoming call authentication. The android platform provides a variety of functions that support the programming of face recognition, as in image processing.

Our proposed system aims to design a Group Policy based Authentication for incoming calls for Android phones. The proposed method enables the user to receive the incoming call by authenticating face recognition using group of persons. There are three main modules in the system work flow including creation of contact group, creating Blacklist and whitelist and authentication mechanism for contact group using face recognition. To receive call from contact group we provide authentication on incoming call as face recognition. Working process of the proposed system is to perform face recognition on images that the user input the face images that stored in database. In a face recognition system there are two main modules including registration module and verification module.

In the registration phase it takes the images of person face including image acquisition, preprocessing, threshold calculation, eigenvector calculation and storage. The process of the registration system that is the first phase i.e. the phase of image acquisition to retrieve data such as face images. The system will perform face detection process after captured the image and automatically be cropping on the detected face. Eigenfaces are the Eigenvectors which are representative of each of the dimensions of this face space and they can be considered as various face features. Any face can be expressed as linear combinations of the singular vectors of the set of faces, and these singular vectors are eigenvectors of the covariance matrices. In the PCA approach the component matching relies on good data to build eigenfaces. In other words, it builds  $M$  eigenvectors for an  $N \times M$  matrix. The image matrix calculation is to find the mean of flatvector which is summing the matrix of all image input and the result divided with the number of images that generate the mean flatvector. Then each flatvector reduced by a mean flatvector. All the results are stored into the database.

In Verification phase describes the recognition process in the system. In this section, the flow of the recognition processes are described through several stages before finally obtained the results of the images were identified. The verification process has main phases are image acquisition, preprocessing, eigenvalue and verification.



**Figure1: Eigenface Processing and store in face database**

The verification process is calculation the smallest value of the difference between eigenvalue in the test face process and eigenvector in training face that stored in the database. The smallest value ( $d$ ) compared with Threshold ( $T$ ) of the image is called the identified image. If the value of  $d$  is smaller than and equal to  $T$  then the image identification result is valid. Otherwise, the image is not valid and is not considered registered. Phone state monitoring it performs continuous sensing call state and when incoming call is detected if yes then it performs verification else if no then it go for phone state. Decision phase it starts verification to find the result. At verification phase if the match is correct it remove the restriction and call receive by any of group member. If match is not correct it rejects and return to the phone state and send message to the caller. The application performs face recognition automatically for authorized user otherwise it prevent the un-authorized user from receiving incoming calls.



**Figure2:Store Face images in database**

## RESULTS

Our proposed system provides secure Group Policy based Authentication for incoming calls for android cell phones.

- Group policy based authentication scheme increases the security which restricts the access of incoming call for un-authorized user.
- We are provide authentication to receive incoming from contact group members.
- Authenticate user based on face recognition using group policy approach.
- It also provides solutions to block unwanted incoming calls by using block calls using blacklist and whitelist.

## CONCLUSION

Today Android mobile operating system becoming very popular the number of users increases day by day, hence there is need strong authentication mechanism to provide more security to access mobile. In the proposed work, we provide the user options to handle incoming calls user friendly using that user can block the unwanted calls by whitelist and blacklist. The appliaction introduces the new approach that group policy and secure that contact group incoming calls using authentication mechanism. Group policy based authentication provides more secure mechanism to receive incoming calls based face recognition. The proposed system will use the eigenface method applied to the android platform produce the high success rate.

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