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Handling Incoming Calls Application for Android Smartphone

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Abstract - *Today android has become the most popular Smartphone operating system as compare to other operating system. Android gives you a platform for creating apps for Android users everywhere, as well as an open marketplace for distributing to them instantly. There is need to develop custom application for handling incoming calls and provide security mechanism at receiver side to receive incoming call ,using the group policy and face recognition authentication to receive incoming calls. It will restrict unauthorized person to receive incoming call.*

***Key Words*: Android Operating System, Face recognition, Incoming Calls, Authentication, Call Block.**

1. INTRODUCTION

The numbers of Smartphone users increasing day by day. 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. Hence, there is need to propose advanced Group Policy authentication scheme for personal identity or other protection purposes. Android also gives you tools for creating apps that look great and take advantage of the hardware capabilities available on each device. We have to build some custom application to handing incoming calls and provide security to receive incoming only by authorized persons.

This project gives the advantage to user handle incoming calls by creating contact group and provides security to receive incoming call from if any contact from contact group. The proposed works also provide mechanism to create whitelist and blacklist the contacts to avoid the unwanted calls.

Mostly used methods for verifying the person identity of an unknown person rely on secret knowledge such as PIN or Password [6]. Biometrics is very convenient on frequently used mobile devices, but environment must also be considered. 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 [6]. 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. It is very difficult to implement face recognition algorithm into mobile devices. We have to consider the lot of factors that gives the better result of face recognition on mobile devices it has been a challenging problem.

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. The implementation is made for the Android platform, using OpenCV libraries for image processing [5]. We should have to consider factors like the processing power and the limited storage of them mobile device, privacy and security concerns are the difficulties that need to be solved.

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 user cannot receive the call unless the application will grant him as an authorized entity. The facial recognition stages are feature analysis, eigenfaces, automatic face processing [1]. Some facial recognition software algorithms identify faces by extracting features from an image of a subjects face.

2. PROPOSED SYSTEM

2.1. System Overview

The proposed system for custom application for incoming call consist main three functional modules shown in fig1.User can handles the incoming calls using the different options provided by the system.

Three main functional modules in the system:

i. Create Contact Group

We can create contact group like friends, family, company employee's group etc. There should be provided an authentication mechanism to receive incoming calls coming form that contact group.

ii. Create Whitelist and Blacklist

You can also block all the calls for some time. Add the contacts from the contact list those users want to reject automatically by creating blacklist. User can also block the unsaved contacts by using whitelist. By using cancel block option user can cancel all blocks calls added in blacklist and whitelist.

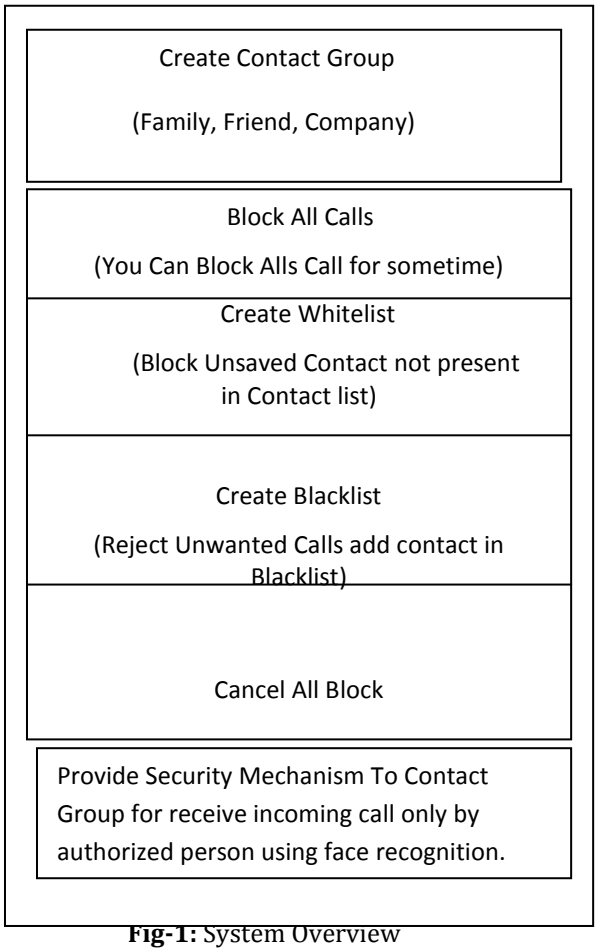

Fig-1: System Overview

iii. Face Recognition Authentication

To provide authentication mechanism to receive incoming calls from contact group by using Face Recognition it is required to implement Real Time Recognition i.e. face recognition must be performed within few seconds to support incoming call authentication and to make application robust under different conditions.

3. METHODOLOGY

The work process of the system is to create group policy based mechanism to handle incoming calls. In this section we explain the flow of proposed system which is created on the android platform. In a system work flow there are three main modules including creation of contact group, creating Blacklist and whitelist and authentication mechanism for contact group using face recognition.

First task of user to create contact group by adding those contacts that user want to secure. User can create a group of friends or family as per user choice user adds contacts in a group.

The Call Block module is used to block calls from contact list or unsaved contacts. If user add particular contact in blacklist if incoming call is from that caller will be reject automatically at receiver side. By creating whitelist user can avoid unwanted calls those are unsaved. You can also block all calls for particular time and also cancel all block [2].

At incoming call braodcastreceiver check contact is from general list or from contact group. It has to also check the contact is present in blacklist or not. If contact is form contact group it secure the incoming call.

- Declare receiver in AndroidManifest:

```
<receiver android:          name=".IncomingCall">
   <intent-filter>
<action
android:name="android.intent.action.PHONE_STATE />
    </intent-filter>
 </receiver>
```

- Read phone state permission in AndroidManifest:

```
<uses-permission
android:name="android.permission.READ_PHONE_STATE">
</uses-permission>
```

- Created class IncomingCall with extends Broadcast Receiver class

```
public class IncomingCall extends BroadcastReceiver
```

- Create method receiver()

public void **onReceive**(Context context, Intent intent)

To receive incoming call we are using mechanism face recognition. This is the third module face recognition to authenticate incoming calls from contact group only to receive by authorized person.

In a face recognition system there are two main modules including registration module and verification module. 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. Basically human face recognition procedure consists of two stages. The first stage is where the face detection process takes place very rapidly in humans except in certain circumstances where the object is located at a far distance. 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 the registration phase it takes the images of person and store in data base. The system will perform face detection process after captured the image and automatically be detected face using Eigenfaces algorithm.

At verification phase if the match is correct it remove the restriction and call receive by authorized person. If match is not correct it rejects and returns to the phase state and reject call.

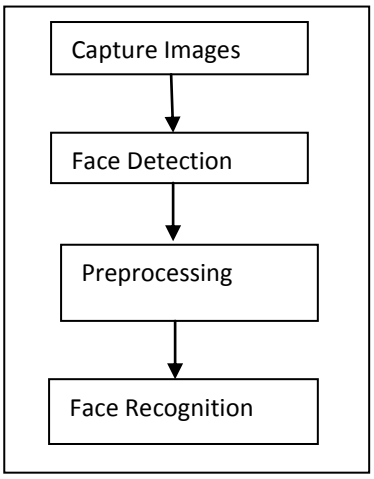

Fig-2: Block Diagram Face Recognition

The work flow of the proposed system is shown in fig.3.It describe the process of on receiver side when incoming call from contact group person it automatically apply authentication mechanism. To verify the person identity if person faces recognized it will receive call otherwise it rejects the call. At phone state on incoming calls we have to also check the contact number is present in blacklist and whitelist if present then it will reject the call.

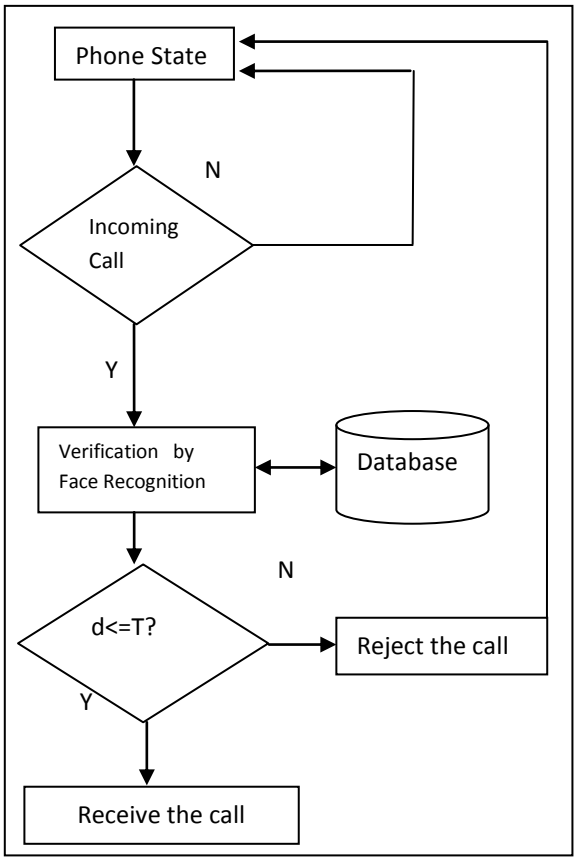

Fig-3: Proposed System

3. CONCLUSION

In this paper, we have proposed the system to handle incoming calls by providing secure mechanism to receive calls based on group policy. The application is build in java programming for android. The system run on devices which supports the android platform.

In the proposed approach, we provide the user options to handle incoming calls user friendly. We introduce the new concept that group policy and secure that contact group incoming calls using authentication mechanism. The system also provides the solutions to avoid unwanted incoming calls by using block calls using blacklist and whitelist.

The proposed system uses authentication mechanism to secure incoming calls at receiver side by using eigenface method for face recognition. To provides a variety of functions that support the programming of face recognition, as in image processing.

Android platform provide the functionally to support the eigenface method and gives better result for face recognition. We provide the authentication to contact group to receive incoming by user. At incoming call from contact group it verifies the user identity by authenticating face. The system also considers the factor response time to answer calls quickly.

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