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SecureU Emergency System using GSM and Android Application

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Abstract: *SecureU is Android based application. This Application allows users to use various help option while facing an accidental situation or such circumstances when the decision making power of human not works. This application is effective, efficient and initiating for helping users at accidental circumstances. This security Application will provide general help features like tracking of person which falls in any accident or in circumstances. This Application provides features like Track-me feature, Sending sms to register persons, Providing nearest Police Station. This Application provides the general features with advance feature which will help not only the women user but also male user for help. SecureU is based on Android Application which permits feasibility to trace the location using GPS. Android Application permits Audio and Video capturing features. GPS technology is use to search the location of person, hospital, police station. Tracing location via Global Positioning System and locating nearby Hospitals, Police Station and victim. SecureU Provides help in such situation where decision power not works efficiently as have to work.*

Keywords: *Android, GPS tracking, GSM, SMS, Audio and Video Capturing.*

I. INTRODUCTION

This Application is mainly developed for women to provide help in such circumstances where no nearest help will be available or a situation where decision power not works efficiently as have to work. Females are not secure nowadays, anywhere. In Indian economy, women's are sign of lord and powerful energy still then the harassment and un-humiliating behaviour are the consequences. Women might belong from any region, any country or from any background, the safety is big issue. There are always insecurity about safety and every women are conscious about safety. The snoop eyes are always present in surrounding. To pretend from any of unfortunate accident, we are developing this application. This Application not even help female user but it also provide help to male users too. Because problem or accident might be arises with anyone at anywhere, where location might be new or known. The need of this application is arises due to the increasing violation, sexual assaults, misbehaviour against the female.

The smart phone is only the medium via help can access, because Smartphone are definitely and easily involve like a body part in our day-to-day life and it also provide location of victim by using GPS (Global Positioning System) to bring help. Sexual Harassments are not only arises with women but also with males in such of circumstances. To provide help to victim using the android based application, is the main intention of this application. It is not possible or not happened that, anyone would be always there with victim to protect from any of accidental situations. This application which is android based, allow victim to use the different features while defeating with a critical situation where you might need for taxi using internet linking facility, police stations, and another instant help. This application bring help where you need and when you need it.

SecureU is android based application in which SQLite database is used. In this database the information is stored related to the application, which allow to store and provides the same data which getting inserted previously in this application. Like some common predefine sms for e.g. Save me, Help me etc. SQLite allows to maintain the some number which is then used in calling purpose in call me application.

A. Problem Definition

In early few years, the women abusing, teasing, misbehaving and harassments crime getting hikes. But security is prior to all. The existing application like Himmat app, VithU, Nirbhaya etc. are also providing the basic features like sending an alert sms over a mobile network using Gateway Mobile Switching Circuit (GMSC), calling a recruit number, and tracking location. But these are basic feature provided over different application where you can only send alert sms, calling and location tracking using the GPS technology etc. To face circumstances where you might need help from nearby Police Station or nearby Hospital etc. at that time this application will not be useful as we need.

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In Accidental situation most of public or persons surrounded by accidental location they might not interested response over a help because they don't want any of issues. No one would like to file a report or help the people because all the process is annoying for them. At that situation secureU will definitely provide and bring help to you. This Android based application will provides you all feature which is expected by you and also that feature which you don't expect like an extra first aid kit tools. Following are some of problems as follows:

Sending an alert message to appointed person manually takes pretty much time.

Alerting by calling to a helping one also create anxiety about situation to called one.

Searching nearby hospital and police Station are not possible in most of the previous applications.

Getting nearby taxi quick to accidental location is problematic.

B. Existing System

There are many Android apps present for security. The most of basics apps are list of emergency contact to alert, GPS tracking to determine location. Some apps contain fake call, video recording etc. Following are the list of some already existing apps:

VithU: This app sends the alert message to emergency contact with updated location.

bSafe you-It contain emergency contacts follow the user through a live GPS trail, in which fake call system ,alert message with location, video, siren present.

Pukar –A personal Safety app: It sends sms alert with GPS location to emergency contact.

Raksha –Women Safety Alert: This application send location alert to emergency contact and dial 100 and send SMS in absence of mobile internet.

Smart 24*7: It provide features like voice record and take photograph during danger situation, also provide police linkup.

Safetipin: This apps provide features like GPS tracking, directions to safe location and various pins for safety and maps to show unsafe area.

Eyewatch Women: This app sends an alert message. It has send location. By pressing I am Safe button, you simply let your kin's know that you have reached safely

Above given application provides the various features but no one gives you complete security. As bSafe, this app is developed by Bipper Inc. On 6th March, 2015. The app's main approach is "Never Walk Alone". This application helps the user to create a gang of 'Guardians' and SOS message will be received by them when the user is in trouble. A V Gumrah Initiative a real time interactive safety application for providing help to needed women. All you need to do just by pressing the power button of your phone twice and the alert message will be sent to previously set contacts along with your location.

But this application have disadvantage like, if you want to send alert message, then you have to press power button twice. Sometime accidentally power button might be gets press or it wouldn't be possible to press it twice. Unfortunately no single application allows you to capture and recording of sound and mainly location based facilities as SecureU allowing you to access.

C. Aim and Objectives

The main Aims and objectives of "secureU" is to provide security using GSM and Android Application.

To provide help to unfortunate person using the android based application, is the main intention of this application.

This Application send message to assigned or registered number using SMS manager which is fully offered by android.

This Application search Location of needy and unprosperous person by tracing and sending location using GPS technology, to the recruited senders.

"SecureU" Application allows user for Recording of video and audio, Capturing of video using inbuilt Camera app.

"SecureU" provide linking for calling taxi services using internet access.

The main Prospective of "SecureU" Android based Application is to Priory to protect from accident. But in case of the accident may occur accidentally then to provide the various functionality might be needed in the situation.

This Application will be work as helping hand to user to be protect itself from unfortunate conditions.

II. LITERATURE SURVEY

A. Bramarambika Thota, Udaya Kanchana Kumar .P

In this paper they present Sauver, an application for android platform. Sauver is a word which is taken from French which means to rescue, to save. The verb form Se Sauver means to escape and to run away from danger situation or from place. This paper

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illustrated the application, Sauver that is designed in android platform for safety of women with the help of such improvements in mobile technology. This application helps the tracking of device using GPS which will help the law enforcement authorities to rescue the person in danger quickly as possible from the anti- social elements.

B. Abhijit Paradkar, Deepak Sharma

In this System, they proposed the system to provide help and supports the gender equality by providing safe environment to women in the society, and freedom for them to work till late nights. Before doing any crime against the women will be hold back and it help reducing the crime rate against the women. Some of the cases the system can provide useful evidences to prove. System recorded audio-video recording of incidences which can act as the evidences. This system allows the tool for detection inside the home where senior citizen, handicapped person or women leaving alone and by detection of criminal it takes necessary action to ensure safety. In this system, they provide safety from capturing the offensive photograph or videos.

C. Saurabh Prabhune , Indrajeet Sharma, Sachin Bayas, Prof. T.B.Mane

Proposed this project in which they uses ANDROID MOBILE APPLICATION FOR SECURE DATA TRANSMISSION system . In this project they uses encryption and decryption of not only the textual files but also media files by using encrypt/decrypt cipher algorithm. By using the three ciphers that they had generated encryption and decryption for security standards and also allow high speed data transmission over Android based devices. Necessary messages and tool tips have been provided wherever needed. They developed system, Which is user friendly as any can easily understand its functionality. But some features and functionality are restricted for registered users and provide with various level security.

D. Gagandeep Singh, Gurjit Singh, and Navdeep Singh

in this paper, they had been implemented the new generation harassment monitoring system and system features to meet the requirements. Using this system it is possible for the user to inform the Security like police and also to parents whenever he/she meets with unexpected circumstances, especially women. More importantly it is not necessary for the security to attend the call, the user just has to press the call button and the software starts its execution. Using telephony manager technique, the proposed new generation harassment monitoring system can adapt to various mobility of user by adjusting network.

E. B.Vijaylaxmi, Renuka.S, Pooja Chennur, Sharangowda.Patil

This paper reviewed the emergency response system which is helpful for women in the incidents of crime. The key objective is to develop a low cost system which can store the data of the members in the particular locality and provide immediate alert in case of crime against women. This provides women security. Being safe and secure is the demand of the day. Our effort behind this project is to design and fabricate a gadget which is so compact in itself that provide advantage of personal security system. This device will probably be very useful for the women. It is certainly a short term and preventive solution. This will be proved as a multi-pronged strategy with the participation of multi stake holders of society. The creation of a hardware and software prototype has achieved two objectives: validation of the proposed architecture and checking whether the utilized technology is Appropriate for the system. This system will help its users in difficult situation. This system would be highly sensitive and easy to handle. Its quick action response will provide safety and security to individual user.

F. Mr. Magesh Kumar.S, Mr. Raj Kumar.M

This application is generally meant for the attention of the authorities or public in the emergency response capabilities such as terrorist attacks and the natural disaster by facilitating the communication with their respective along the mobile phones. This project presents an alert system for PROB detection using common commercially available electronic devices to both detect the PROB and alert authorities. this system provide alerts pre-specified social contacts with an informational message via SMS. If a contact responds the system commits an audible notification, automatically connects, and enables the speakerphone.

III. PROPOSED SYSTEM

SecureU android Based application is design to secure over an accidental situation. This application uses the GPS, GSM and Android technologies to provide security. In this application following features are provide as follows:

If any person falls in accidental case it would provide help by just clicking alert button.

his application send an alert message to number of defined senders, to alert for help.

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SecureU will provide a video capturing feature at the accidental time after clicking an alert button.

If victim wants help of Police then this app will call and sends location of victim for help.

SecureU will trace location of user and send location information by the help of GPS. The location is major issue for getting location and clue for evidence.

It provide situation based help if you are facing some accident then at that situation if are searching for hospital then you will able to know nearby Hospital.

If no such major accident is occurred and you need first aid then this application provides you location of Pharmacy.

SecureU will also assess help related Taxi at such situation when accident occurs at new place or no nearby taxi are found.

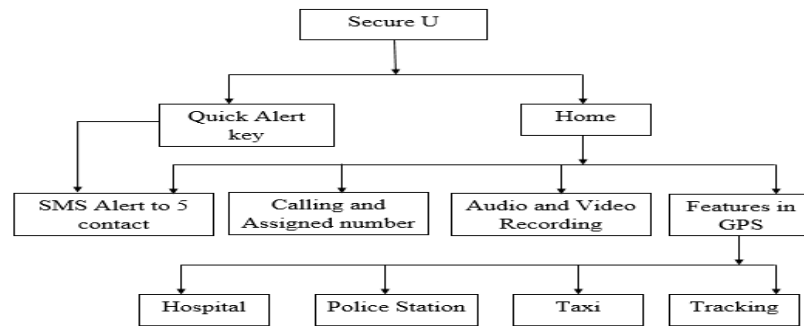


Figure 1: Flow Diagram

IV. RESEARCH METHODOLOGY

A. GPS

GPS Stands for "Global Positioning System." GPS is a satellite navigation system used to determine the ground position of any object. GPS technology was firstly introduce for used by the United States military in the 1960s and expanded into civilian use over the next few decades. Today, GPS receivers are included in many commercial products, such as automobiles, smartphones, exercise watches, and GIS devices. GPS is a worldwide radio-navigation system formed from the constellation of 24 satellites and their ground stations GPS use satellite data to calculate an exact location on the earth. It can also track the movement of a vehicle or person. These calculations can relate the user's position to almost any map projection within mille-seconds. GPS is track the movement by using TrackPoint. *Track Point's*: The behavior of a receiver when recording a TrackPoint is different for each Model. Typically the receiver will store a values of co-ordinate and ID location either at periodic interval or when it detects a specific changes in user direction. GPS tracking system can be used by a company to examine the route and progress of a delivery vehicle, and by parents to check the location of their child, or even to sniff round high-valued assets in transit. A GPS tracking system uses the Global Navigation Satellite System (GNSS) network. This network inclusive a range of satellites that use microwave signals that are transmitted to GPS devices to give information on location base services, vehicle speed, time and direction. So, a GPS tracking system can gives potentially strong both real-time and historic navigation data on any kind of journey.

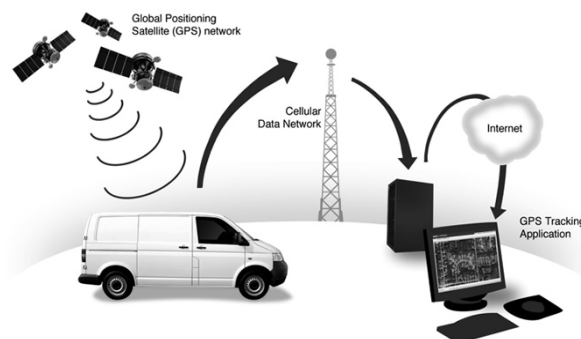


Figure 2: GPS Tracking

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A GPS tracking system can work in several ways. From a commercial perspective, GPS devices are usually used to gather information about the position of vehicles as they make their journeys. Some systems or devices will store the data within the GPS tracking system itself (known as passive tracking) and other send the information to a centralized database.

An active GPS tracking system is also called as a real-time system as this method directly sends the information on the GPS system to a central tracking portal or system in real-time as it happens.

B. GSM

GSM means Global System for Mobile Communication.

GSM is developed to describe protocol for second generation (2G) digital cellular network used by mobile.

GSM uses a variation of time division multiple access (TDMA) and used three digital wireless telephony technologies (TDMA, GSM, CDMA).

Mobile services based on GSM technology were first launched in Finland in 1991

C. The Architecture of GSM Network

The GSM network contains three parts -SS, BSS and OSS

The switching system-In SS many vital operation are done. The SS holds five database are HLR, MSC, VLR, AUC and EIR.

HLR-It stands for Home Location Register which holds important information of subscriber like subscriber service profile, status of activities, location information etc. It is known for storing and managing information of subscriber. After purchasing new connection the subscriber first register in HLR of mobile phone companies.

MSC-It stands for Mobile Service Switching Center. It is important part of SS. It helps technical end of telephony. Its main responsibility is to control the calls to and from other telephone. Its other tasks are ticketing, common channel signaling etc.

VLR-It means Visitors Location Register. In this database store temporary data related to user. VLR directly connected to MSC.

AUC -It means Authentication Center. It is small part which handles the security of system. Its major responsibility is give authentication and encrypt user's personal information.

ELR -It stand for Equipment Identity Register. This database holds important information regarding mobile equipment.

BSS -The Base Station Systems play important role in mobile communications is connecting user to mobile network. BSS system are divided into two type BSC and BTS.

BTS -It stands for the Base Transceiver Station. The user, mobile stations or mobile phones connect to mobile network through BTS. It support for communication using radio transmission with mobile station.

BSC -it stands for Base Station Controller. It provide physical link between user or mobile subscriber and BTS to manage and control function on it. It perform cell configuration data, control radio frequency in BTS.

The Operation and Support system-OMC means operations and maintenance center help to connect to equipment of MSC and BSC. The implementation of OMC called OSS which helps in mobile network to monitor and control the complicated systems. It also helps in managing, centralizing, local and regional activities required for GSM network.

The Following figure illustrate GSM System Architecture,

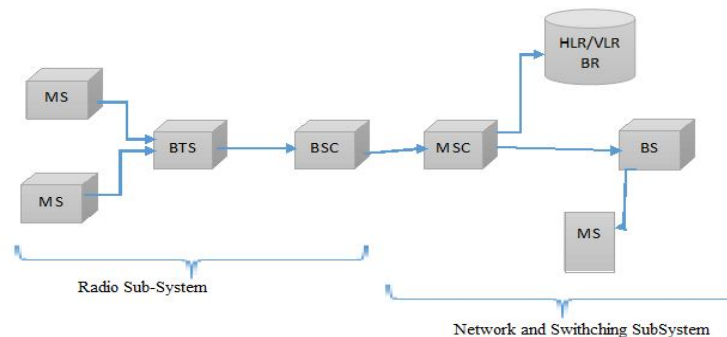


Figure 3: System Architecture GSM

D. Android Technology

Android is most popular mobile operating system.

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Applications based on Android make life comfortable, easier, and convenient and advanced for the user.

Android phones are highly customizable and flexible and as such can be altered to suit your choice and manage according to your needs; with the help of wallpapers, themes, icon and launchers which completely changes the appearance of your devices interface. You can download applications to do all sorts of things like check your Facebook, WhatsApp, Hikes, Twitter feeds and other social applications, manage your bank account, online shopping's order pizza and play games. You can add reminders, meetings, plan events on from your phone's calendar and view them on your computer or browse websites on your desktop and pick them up on your Smartphone. Another important feature of Android devices is that it personally backs up your contacts for you. When you set up your Google account with an Android phone. You will just need to create a Google Account or sign in with an existing account. Whenever user add new contact to its address book it will synchronized contact with your Google account whenever your data is ON.

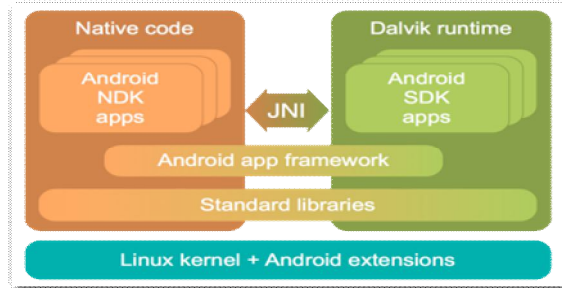


Figure 4: Android based structure

The Android mobile operating system release with its first version known as Android alpha in November 2007. The first commercial version of Android 1.0, was released in September 2008. Android is continually developed by Google and the Open Handset Alliance (OHA), and has seen a number of updates to its base operating system since the initial release.

To develop any android application you need to have Software Development Kit (SDK), Android development Kit (ADT), Java Platform, Eclipse or Android Studio.

Initial Versions 1.0 and 1.1 were not released under specific code names, but since April 2009's Android 1.5 "Cupcake", Android versions have had confectionery -themed codes names. Each is in alphabetical order, with the most recent being Android 7.0 "Nougat", released in August 2016

Following are the names of android version, release Date with their code name

| Code name | Version number | Initial release date | API level |
|---------------------------|----------------|----------------------|-----------|
| N/A | 1.0 | 23 September 2008 | 1 |
| | 1.1 | 9 February 2009 | 2 |
| Cupcake | 1.5 | 27 April 2009 | 3 |
| Donut | 1.6 | 15 September 2009 | 4 |
| Eclair | 2.0 – 2.1 | 26 October 2009 | 5–7 |
| <u>Froyo</u> | 2.2 – 2.2.3 | 20 May 2010 | 8 |
| <u>Gingerbread</u> | 2.3 – 2.3.7 | 6 December 2010 | 9–10 |
| <u>Honeycomb</u> | 3.0 – 3.2.6 | 22 February 2011 | 11–13 |
| <u>Ice Cream Sandwich</u> | 4.0 – 4.0.4 | 18 October 2011 | 14–15 |
| <u>Jelly Bean</u> | 4.1 – 4.3.1 | 9 July 2012 | 16–18 |
| <u>KitKat</u> | 4.4 – 4.4.4 | 31 October 2013 | 19–20 |
| <u>Lollipop</u> | 5.0 – 5.1.1 | 12 November 2014 | 21–22 |
| <u>Marshmallow</u> | 6.0 – 6.0.1 | 5 October 2015 | 23 |
| <u>Nougat</u> | 7.0 | 22 August 2016 | 24 |

Table 1: Android Version

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E. Dalvik Virtual Machine (DVM)

The Dalvik Virtual Machine (DVM) is an android virtual machine optimized for mobile devices. Virtual machine optimizes the memory, battery life and performance. In the Iceland there is town named as Dalvik. The Dalvik VM was written by Dan Bornstein. The Dalvik Virtual Machine runs the .dex file which is converted by Dex compiler from the class files into the .dex file. Single one dex files are created from multiple class files. The javac tool compiles the java source file and then converted into the class file. The dx tool takes all the class files of your application and generates a single .dex file. Dalvik Virtual Machine is a platform-specific tool. The packaging process handles by The Android Assets Packaging Tool (aapt) . Below is the compiling and packaging process from the source file:

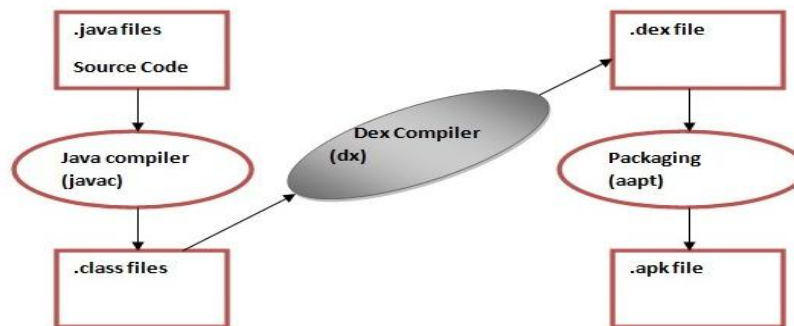


Fig 5: Compiling and packaging process

F. Android SDK Software Development Kit

Android provides Android SDK (Software Development Kit) for software development.

A software development kit enables developers to create applications for the Android platform. The Android SDK consist of sample projects with source code, development tools, an emulator, and required libraries to build Android applications. The Java programming language use to write Android Applications and run on Dalvik Virtual Machine, a custom virtual machine designed for embedded use which runs on top of a Linux kernel. The inventor and developer of Android operating system is Google Which is based on the Linux kernel and primarily designed for touchscreen mobile devices such as smartphones, touchscreen devices and tablets. Android's user interface is mainly based on direct manipulation, using touch gestures that directly correspond to real-world actions. Using swiping, tapping and pinching, we can able to manipulate on-screen objects, along with a virtual keyboard for text input.

G. SQLite

SQLite is an in-process library which implements a server less, self-contained, zero-configuration, transactional SQL database engine. SQLite is free for use for any purpose that might be for private or for commercial because the code for SQLite is in public domain. The light weighted SQLite is the most widely used and deployed database in the world. SQLite is used with so many applications hence we can't count, including several high-profile projects. SQLite is an embedded SQL database engine. Unlike most other SQL databases, SQLite does not have a separate server process for manipulation over data. SQLite reads from ordinary disk files and writes to ordinary disk files. A SQL database is a composition of complete multiple tables, views, triggers, and indices, is contained in a single disk file. The file format of database is cross-platform – Where you can freely copy and paste a database between 32-bit and 64-bit systems or between little-endian and big-endian architectures. SQLite makes a popular by these features choice as an Application File Format. SQLite is not as a replacement for Oracle but it's an optional replacement for fopen (SQLite is a compact library. SQLite enables all features, likes the library size can be less than 500KiB, depending on the compiler optimization settings and target platform. (64-bit code is larger. Many compiler optimizes codes and files such as aggressive function in loop unrolling and lining can cause the object code to be much larger.) If optional features are excluded, the size of the SQLite library can be reduced below 300KiB. SQLite can also run in minimal stack space (4KiB) and very little heap (100KiB). For making SQLite a popular database engine refers on memory constrained gadgets such as cell phones, PDAs, and MP3 players. There is a trade-off between memory usage and speed. SQLite generally runs faster the more memory you give it. Even though, performance is usually quite good even if low-memory environments are provided.

V. HARDWARE AND SOFTWARE REQUIREMENTS

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A. Hardware

Pentium 4 dual core, hard disk, keyboard, And mouse, RAM 512 mb

B. Mobile

Android supported device. Version 2.1 or above.

C. Software Operating System

Windows 7/8, Linux (android mobile)

D. Front End

eclipse Juno

E. Back End

SQLite

VI. CONCLUSION AND FUTURE SCOPE

A. Conclusion

This application will provide help not only to the Female users but also Male user. This application is easy to use with multiple functionality where you can find all kinds of help like send message alert with location, calling to assign number, Location based tracking of victim. SecureU not only help you in circumstances but it also helps to know how to make secure while such circumstances. Tracing location will help to locate and trace the victim to bring help.

B. Future Scope

In Future we can allow user only by shaking Android cell phone. We can add Gesture setting for recording audio, capturing video, Capturing image, sending message and calling to recruited or assigned number with flexible allowance. We can allow guest user for emergency.

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