

January 2016

## SCS: SMART CALL SYSTEM FOR EMERGENCY ROAD ACCIDENT SITUATIONS

ANIKET H .KHANDAR

*Department of Computer Engg.,RajarshiShahu College of Engineering, Tathawade, Pune-33, Pune, India.,  
khandar\_aniket@rediffmail.com*

KUNALK. MAHAJAN

*Department of Computer Engg.,RajarshiShahu College of Engineering, Tathawade, Pune-33, Pune, India.,  
kunalmahajan7289@gmail.com*

PAVANR. GADEWAR

*Department of Computer Engg.,RajarshiShahu College of Engineering, Tathawade, Pune-33, Pune, India.,  
gadewar.pavan@gmail.com*

AKSHAYJ. GANDHI

*Department of Computer Engg.,RajarshiShahu College of Engineering, Tathawade, Pune-33, Pune, India.,  
akshayjgandhi@gmail.com*

Follow this and additional works at: <https://www.interscience.in/ijcct>

---

### Recommended Citation

.KHANDAR, ANIKET H; MAHAJAN, KUNALK.; GADEWAR, PAVANR.; and GANDHI, AKSHAYJ. (2016) "SCS: SMART CALL SYSTEM FOR EMERGENCY ROAD ACCIDENT SITUATIONS," *International Journal of Computer and Communication Technology*. Vol. 7 : Iss. 1 , Article 10.

DOI: 10.47893/IJCCT.2016.1333

Available at: <https://www.interscience.in/ijcct/vol7/iss1/10>

This Article is brought to you for free and open access by the Interscience Journals at Interscience Research Network. It has been accepted for inclusion in International Journal of Computer and Communication Technology by an authorized editor of Interscience Research Network. For more information, please contact [sritampatnaik@gmail.com](mailto:sritampatnaik@gmail.com).

# SCS: SMART CALL SYSTEM FOR EMERGENCY ROAD ACCIDENT SITUATIONS

ANIKET H.KHANDAR<sup>1</sup>, KUNALK.MAHAJAN<sup>2</sup>, PAVANR.GADEWAR<sup>3</sup> & AKSHAYJ.GANDHI<sup>4</sup>

<sup>1,2,3&4</sup>Department of Computer Engg.,RajarshiShahu College of Engineering, Tathawade, Pune-33, Pune, India.  
E-mail: khandar\_aniket@rediffmail.com,kunalmahajan7289@gmail.com,gadewar.pavan@gmail.com,  
akshayjgandhi@gmail.com

---

**Abstract-** Late arrival of help in emergency situation like road accident can lead a person to death. Getting the help depends on time required to alert the helper. There are many Location Based Services available in today's smartphones that are usually used for the applications like navigation, travelling and many of the commercial applications. Many of the location based services are also in the field of emergency alert system, but each of them needs the human intervention. If the victim gets in the emergency situation like road accident and no help is available, and at the same time if he is not able to make call for help then the things get worst. In such situation the victim can only rely for help on the helper to whom he trusts, because usually the nearby people do not take the responsibility of the situation like road accident which is known as "bystander-effect". Smart Call System (SCS) is the intellectual call system which will automatically alert the user's helper without the user intervention. This will be made possible by using the Global Positioning System (GPS), Pull and Push services. Thus the help can be provided to the victim through the SCS.

**Keywords-** *Bystander-effect, Global Positioning System, Location Based Services, Pull and Push Services, Smart Call System.*

---

## I. INTRODUCTION

Use of mobile has become interleaved with the life style of the modern society and this leads to the increasing demand of various services; the location based services are one of them. A number of studies been done on location-based services (LBS) due to its wide range of potential applications. LBS can be used to provide useful information such as tourism guide and roadside assistance to users according to the current locations of them.

It is consisted of mobile devices, communication networks, service provider and data provider [1].LBS on mobile devices are now be commonly used by individual as well as many governmental bodies such as police, defence, etc. LBS are those services which work on users' location.

However there are many location based services available, still the services which have emphasis on personal safety and emergency support are scarce. Research has shown that especially in busy urban district, help from fellow citizen is hard to receive because of the so called as bystander-effect: Nearby people often do not recognize or take responsibility for ongoing emergency situations [2].

Therefore we propose our system which will enable location based services for emergency cases that will work automatically for the user's help. The system will make the use of pull and push services along with GPS in intellectual and efficient manner. The purpose of designing the system is to provide the service which is simple, fast, and inconspicuous and which will work for the user in critical situation.

## II. RELATED WORK

There are many researches and work that has been done in the field of LBS.

### A. GPS

Global Positioning System (GPS) is a space based satellite navigation system that provides location information in all whether, anywhere on or near the earth, where there is an unobstructed line of sight to four or more GPS satellites. It uses global geocentric co-ordinate system; and it comprises of 24 satellites. It is maintained by United State Government and is freely accessible to anyone with a GPS receiver [3].

### B. JTAPI

Java Telephony Application Programming Interface (JTAPI) was designed by a consortium of industry-leading computer and telecommunications companies in designing a portable object oriented API for computer telephony integrated call control. It is extensible API design to scale for use in range of domains, from first-party call control in a consumer device to third-party call control in large distributed call centres [4].

### C. jSMS

jSMS is a Java API for sending and receiving short messages (SMS) and multimedia messages (MMS). The API supports a wide range of communication protocols such as Global System for Mobile (GSM), Universal Computing Protocol (UCP), and Short message peer to peer (SMPP) etc. As well as wide range of short message format such as plain text messages (7-bit alphabet), Unicode messages (UCS2) etc [5].

### D. Pull Location Based Service

The Pull Location Based Architecture need or desire triggers for the request of Location Based Advertising and considered as favourable attitudes towards marketer [1].

#### E. Push location Based Service

Push Location Based Service is understood if the user in certain location is pushed the information related to their location currently [1].

#### F. Existing System

Currently, we observed that there are many systems which work for handling the emergency case. Fig. 1 shows the work flow of the Police Emergency Case Management System.

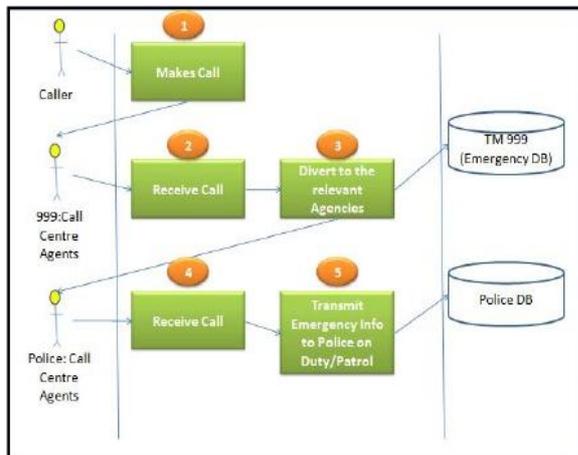


Fig. 1 The Mobile Conceptual Design for Mobile Pull LBS in Police Emergency Case Management System [1].

In this system, the calls from caller will be received by the 999 call centre agents. The call then will be diverted to respective agencies like Police Call Centre Agents or Fire Fighters. The information of the calls too will be recorded directly into Telekom Emergency Database and the Police Database [1]. After then the respective nearest officer will get alert about the emergency situation. This system will work only when the user will initiate the call.

Similarly, Fig. 2 shows the Social Emergency Alert Service [2] which also work for handling the emergency situation, this system also need the human intervention. In this system, the users' mobile will have a widget in a shape of simple button on the home screen of the mobile phone. The user will simply press this button and the respective nearby helper will get the alert notification through the Emergency Alert Server used by the system [2]. All of the above systems needs the human intervention in<sup>a</sup>. somehow manner.

### III. PROPOSED SYSTEM

We propose Smart Call System (SCS) as intellectual calling system which will work automatically in

emergency road accident situations. The system will inform the helper automatically that will be predefined by the user. The call to the helper with the complete information about user will be made without the user intervention. This system will work

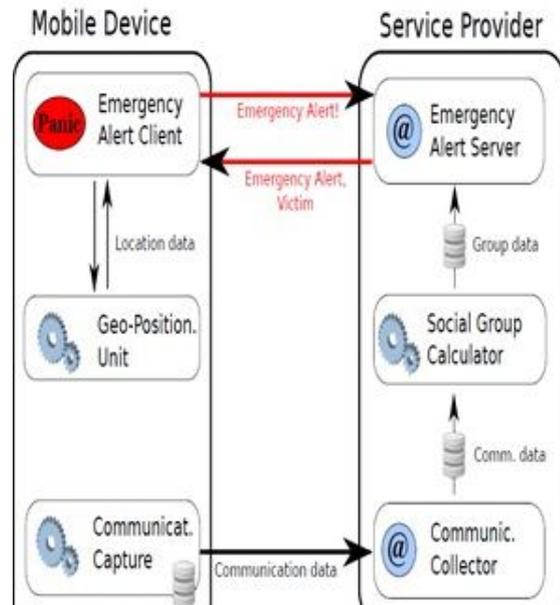


Fig. 2 Architecture of Emergency Accidental Services (EAS) [2].

when the user need help and is not able to make a call for help. According to the Latane and Darley [6] identified 5 steps of the process leading to help. In their model the first four steps have to be passed successfully before help is provided. A potential helper must (1) notice that something is happening, (2) interpret that event as an emergency, (3) take responsibility for helping and (4) decide how to help. Only then in step (5) providing help actually takes place. Many obstacles disrupt the process so that no help will be provided. That is what is called the bystander effect [2]. Our proposed system will work as per the above aspects by informing the helper in emergency situation when the user is not able to call. The calling process in our system comprises of use of Global Positioning System (GPS), Pull and Push Services, General Packet Radio Service (GPRS), and Graphical User Interface (GUI) built by using Eclipse IDE for Android Operating System. Work flow of the system is as flow in Fig. 2

The system will comprise of flowing modules:

#### 1) Client:

Client side will have following things:

- a. *GPS Tracker:* Using GPS Tracker latitude and longitude of the location of client is calculated.
- b. *Suspension or resumption of application:* User can suspend or resume the application as per the user's need. This will be made possible through GUI.
- c. *Server Connection:* Client sends the latitude and longitude co-ordinates continuously onto the server by using push

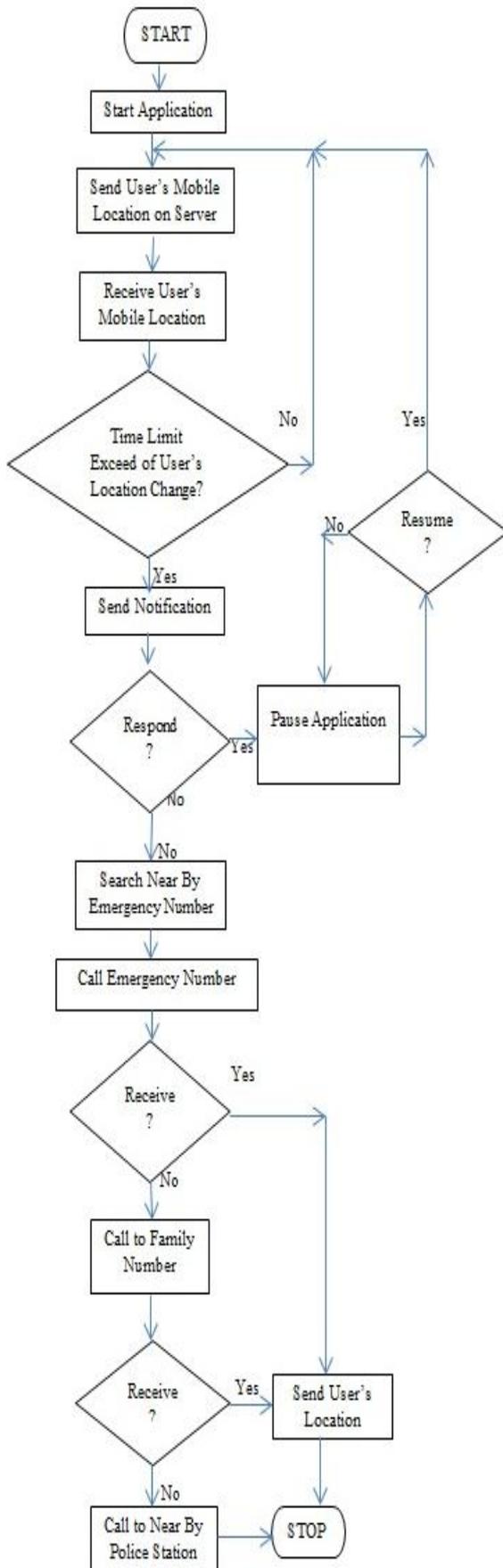


Fig.3 Work Flow of SCS: Smart Call System for Emergency Road Accident Situations.

c.services: Due to this server will get continuous updates about user's location.

## 2) Server:

Server is a component that remains active throughout the process and will have phonic modem connected to it. Server will perform the following functions:

a. *a. Find Location:* Latitude and longitude coordinates will be used by the server to find the location of the user. For this purpose the server will check the different cases those are; (1) whether the co-ordinates of user's location are continuously changing or not or (2) whether the server has not receive any change in co-ordinate for longer period of time. In first case if the server is receiving the change in co-ordinate then there is no problem. But if there is no change in position of user then the server will first check whether the user has paused or suspend the service intentionally which user can do as mentioned in section III.1.b, but if the service is not suspended by the user and still there is no change in location co-ordinates, then the server will first notify the user about no change and will wait for the response from the user. If no response is made from the client side before the time limit, then the server will initiate the calling procedure for the help and it will fetch the current location of the user.

b. *b. Calling Procedure:* After fetching the location of user, the system will integrate the user's current location in voice message and that message will be used for calling to user's emergency contacts. This message will be already stored at server side. Making a call to the helper will be as per the priorities, and according to the priorities the first call for help will be made to the nearest helper which will be calculated on the basis of the location of the user that was tracked by the server; after that the call will be made to the user's home contact and if there is no response from both the above cases then the call will be made to the respective nearest police station as mentioned in Fig. 3. In case if the user's mobile got damaged in accident then the server will make a call by using the last location that was tracked by the server. The calling procedure can be implemented by using JTAPI. The purpose of following the above calling approach is to eliminate the bystander effect which is mentioned in Section I. Soon after the call is made the server will create the Uniform Resource Locator (URL) of the user's last location and it will be forwarded to the all helpers using jSMS technology, so that the helper will come to know about the exact location of the user. The graphical overview of the proposed system which is mentioned above is as in Fig. 4:

#### IV. FEATURES OF PROPOSED SYSTEM

- a) SCS provide the provision of automatic calling for help without human intervention which make SCS as an intelligent calling system.
- b) Finding the nearest helper, helps in optimizing the information flow which will help to optimize the total work flow of handling the emergency cases.



Fig. 4 Overview of SCS System

- c) The calling procedure will be completely handled by the server which will make possible to the system to work even after the damage to the mobile.
- d) Through the SCS, correct information will be made available to the helper in critical situation
- e) It is feasible to implement the system and also cost-efficient.
- f) Use of standard timing for making call makes the system usable and reliable.
- g) Features like suspension, resumption and the proper notifications to the user before making call for help eliminate the unnecessary calling and makes the system user friendly.
- h) The system will work on individual level as well as at on public level like for bus, train, planes etc.

#### V. Conclusion And Future Work

Our study helps for constructing the automatic emergency calling system which will work without

human intervention. It optimizes the total work flow of handling the emergency cases. It is useful for the android user when they are travelling by road. It guarantees about informing the correct location of the user to the helper when the emergency help is needed. In term of future work, the system can implemented for other mobiles, working on different operating system. More secure and accurate algorithm can be implemented to deal with the situation like lost of network.

#### REFERENCES

- [1] NoraziahTulhidayuKamarudin, Sazilah Salam, "Enabling Mobile Location Based Services for Emergency Cases", Research and Innovation in Information Systems (ICRIIS), 2011 International Conference onDate of Conference: 23-24 Nov. 2011
- [2] Michael Ovelg'onne, Andreas C. Sonnenbichler,Andreas Geyer-Schulz, "Social Emergency AlertService - A Location-Based Privacy-Aware PersonalSafety Service", 2010 Fourth International Conferenceon Next Generation Mobile Applications, Services andTechnologies, 978-0-7695-4121-1/10 © 2010 IEEE DOI 10.1109/NGMAST.2010.27.
- [3] Yu-Chih Liao, Jin-TsongJeng, Chen-Chia Chuang,Jhih-Ciao Chen, "Systematic Design for the GlobalPositional Systems with Application in IntelligentGoogle Android Phone", Proceedings of 2011International Conference on System Science andEngineering, Macau, China - June 2011, 978-1-61284-471-8/11/©2011 IEEE.
- [4] java.sun.com/products/jtapi.
- [5] objectxp.com/en/products/jsms.
- [6] B. Latan´e and J. M. Darley, The UnresponsiveBystander: Why doesn't he help? New York:Appleton-Century-Crofts, 1970.
- [7] Sandeep Kumar, Mohammed Abdul Qadeer, Archana Gupta "Location Based Services using Android" Internet Multimedia Services Architecture and Applications (IMSAA), 2009 IEEE International Conference on Digital Object Identifier:10.1109/IMSAA.2009.5439442Publication Year: 2009.
- [8] He Li1, Lai Zhijian2,"The Study and Implementation of Mobile GPS Navigation System Based on Google Maps",International Conference on Computer and Information Application (ICCIA 2010) 978-1-4244-8598-7 /10 C 2010 IEEE.
- [9] Mircea Popa1, Veronica Argesanu2, and AncaSorana Popa3," Car Finding with a Pedestrian Navigation System",978-1-4244-7562-9/10 ©2010 IEEE.

