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Implementing Mobile-sensing Cloud (MScloud) in Rescue Service Architecture for Disaster Management

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Abstract—*Rescue services play a important role in emergency circumstances in order to mitigate damage and rescue victims. The system integrates rescue schemes for different purposes, including disaster prediction, evacuation planning, and emergency broadcast. In this System multiple-sensed mobile devices are designed to provide a personalized situational awareness, thereby further enhancing the flexibility and efficiency of rescue services. Efficiency in rescue system is the major and important concern when we are talking about rescue architecture. In the existing system the mobile sensing information is collected and sends to Emergency Cloud for further processing. Practically, we can observe by just sending the raw data to Emergency Cloud does not satisfy the efficiency measure and can lead to delay in response in emergency situation. So we are proposing pre-processing of sensing information before sending it to Emergency Cloud which will make it easier and faster for emergency cloud to take analyze the situation. The technique that we are using is Location based context aware recommendation system. This system pre-processes the information from device and predefined behavior of users and formats the decision tree and the decision tree will be send to Emergency cloud and the cloud then will take the action and broadcast the rescue alerts to team and nearby people. In this paper can do two things, one is efficiently finding users current location and the condition of device and this can be done through decision tree and hence more efficient that existing model.*

1. INTRODUCTION

A sensors-assisted rescue service architecture can be helpful to integrate rescue schemes as varied as Disaster prediction, Evacuation planning & Emergency broadcast. Rescue services are vital in emergency services to minimize the damage & the damaged. Delivering the quickly& accurately collected information to rescue centres Via wireless/fixed networks is very crucial for dispatching rescue work to different.

Teams like Polices, Fire-fighters or Medicos as per the rescue planning & decisions. Current rescue systems (of Emergency Calls) have significant problems in emergency; the victim may not be in a position to activate/initiate the required help & in-efficiency during massive casualty situations.

However, current rescue systems suffer from two significant problems:

- Emergency information is collected and reported by individuals. In some emergency situations when a person is kidnapped or has an injury, he/she is unable to activate rescue services or report emergency information clearly, e.g., making emergency calls by hands or even by mouths.
- A rescue centre becomes a bottleneck for large scale emergent events. Current rescue systems do not ensure the scalability and reliability in massive casualty environments.

The example of the attack on the World Trade Centre in New York on September 11, 2001 is that heavy emergency call caused sudden and severe congestion in the phone system, preventing the quick and efficient gathering of emergency and damage information by government authorities.

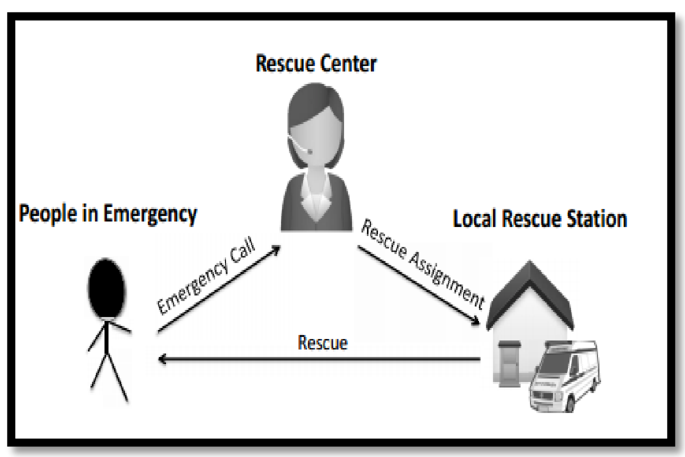


Fig. 1: Current Rescue System

These problems can be overcome by Mobile-sensing Cloud rescue service. Architecture which incorporates multiple-sensed mobile devices with cloud computing. Current mobile phones equipped with multiple sensors like visual, audio, motion, Location, ambient & other physiological sensors are capable of sensing the situational information of local environment & behavior status of user.

Inspired by wireless ad-hoc and sensor networks (WASNs) that have made significant contributions in surveillance and health care, we propose the concept of personalized Situational Awareness by using multiple-sensed mobile phones in our rescue architecture for automated monitoring and up-dating personalized emergency information.

2. RELATED WORK

In the existing system the mobile sensing information is collected and sends to Emergency Cloud for further processing. Practically, we can observe by just sending the raw data to Emergency Cloud does not satisfy the efficiency measure and can lead to delay in response in emergency situation.

So we are proposing pre-processing of sensing information before sending it to Emergency Cloud which will make it easier and faster for emergency cloud to take analyze the situation. The technique that we are using is Location based context aware recommendation system. This technique can do two things for us, one is efficiently finding users current location and the condition of device and this can be done through decision tree and hence more efficient that existing model. Location recommendation systems have focused on automatically inferring a user's preferences while little attention has been devoted to the recommendation algorithms.

Location recommendation systems with a focus on recommendation algorithms generally require the user to complete complicated and time consuming surveys and rarely consider the user’s current context. The detection of the form of transportation and the user interface was implemented on the Nokia N900 phone, the recommendation algorithm was implemented on a server which communicates with the phone. we have seen the system seems to potential but not efficient. The user device behavioral data and environmental data have been processed randomly and no special techniques have been applied for the same. This makes Emergency cloud to waste time on pre-processing the raw data and makes delay in decision from Emergency cloud.

In this paper, we proposed the Location based context aware recommendation system. This system pre-processes the information from device and predefined behavior of users and formats the decision tree and the decision tree will be send to Emergency cloud and the cloud then will take the action and broadcast the rescue alerts to team and nearby people.

2.1 Architecture Block Diagram Of System

Fig. 2.1 shows the Block Diagram of system. There are four entities Device, web Service, Emergency cloud, Rescue team and nearby people. We have implemented these four entities based on different platform with different application layer.

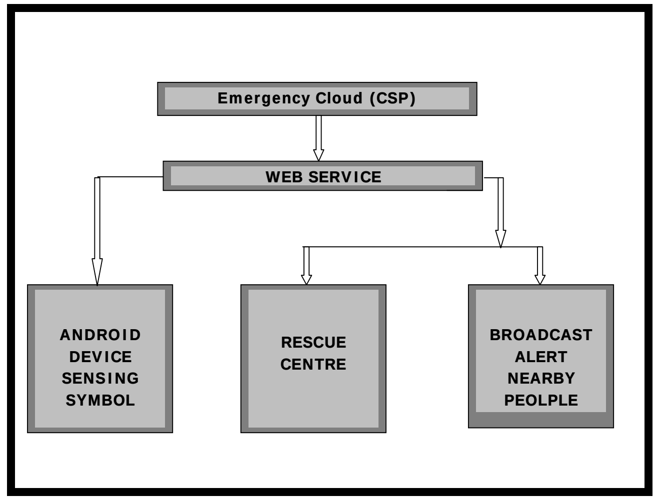


Fig. 2.1: Block Diagram Of a System

2.1.1 Emergency cloud

Emergency cloud is implemented as the VM on cloud which performs the main operation. This is also written in PHP and which takes decision tree from the web service obtained from device and performs the decision making. Based on these decision making emergency cloud gives response to nearby people and rescue team. Response to nearby people is through the broadcasting and done in implementation through control panel.

2.1.2 Device

The device used in the implementation is the actual device and mostly device should have all possible sensors available in android OS. This can be nexus or iphone. Mostly all these sensors are available in the recent mobile available in market.

2.1.3 Web Service

Web service is written in PHP language, the main use of this to communicate between cloud and device as there is no direct communication available. Web service takes the request in json or xml format and sends this to cloud for processing. Then Emergency cloud process and send the response back to web service.

Web service is the software layer between devices and cloud which implements as the interface between these two. Pre-processing of raw data is being taken care by web service only which is the research portion of our proposed approach.

2.1.4 Nearby People and Rescue team

We have provided login details for both of these and provided the control panel for each of them, which gives complete track of alerts and notifications.

2.2 System Model And Data Flow Diagram Of System

Fig. 2.2 shows the system architecture. The device in block diagram is the actual device with all latest sensing information. The sensing device will collect all the sensing information when the device is supposed to meet an accident.

Web service will then process all the information using context aware recommendation system and send to the cloud for further processing

The key player in the application is the emergency cloud which will make the decision based on decision tree. Message broadcast system is the system which perform the entire message delivery task to nearby people and rescue system.

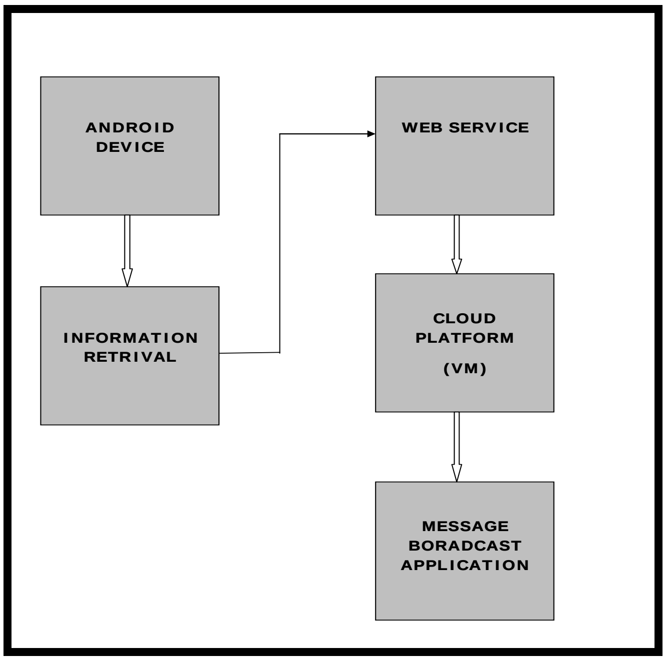


Fig. 2.2: System Architecture

Emergency cloud web service process this information using context aware recommendation system to improve time efficiency. Emergency cloud then makes a decision based on decision tree and response back. The response will be sending to nearby people and rescue team. The rescue team will take appropriate action.

2.3 Mathematical Steps In Implementation Of System

We are using hidden Markov model for generating decision tree, which is used to identify users transition from stationery to moving or vice-versa and pre-processing data before sending to emergency cloud. Here we are using Context Aware Recommendation Algorithm, The purpose of this is to design a more complete ubiquitous location based recommendation algorithm that by inferring user's preferences and considering time geography and similarity measurements automatically, betters the user experience. In this system learns user preferences by mining a person’s social network profile.

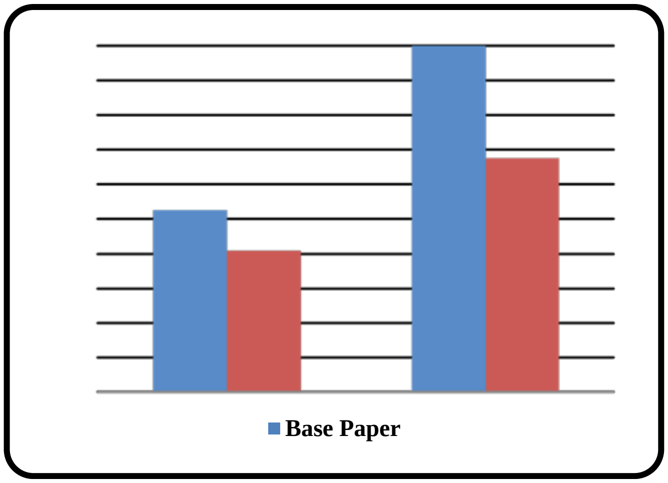
Recommendation algorithm is based on a text classification problem. The detection of the form of transportation and the user interface was implemented on the Nokia N900 phone, the recommendation algorithm was implemented on a server which communicates with the phone. The novelty of our approach relies on the fusion of information inferred from a user’s social network profile and his/her mobile phone’s sensors for place discover.

Context Aware Recommendation Algorithm

```
Start()
{
Initialize app();
Initialize GPS, accelometer;
If(no_event)
{
no_action();
}
Else
{
Start_procedure()
Raw_data_generation()
If(context_aware_recommendation active)
{
Pre-processor_data();
Decision_tree_monitoring();
Emergency_cloud_decision();
Generate_message()
}
Else
{
Process in normal way
}
}
Stop()
```

3. RESULT AND DISCUSSION

The most important thing is the time taken by the Emergency Cloud to response back to the rescue team and nearby people. As we have specified in research that we have preprocess the raw data before sending it to the cloud that minimizes the time system seems to potential but not efficient. So it can easily viewable from analysis.



4. CONCLUSION AND FUTURE SCOPE

In this study we presented Location based context aware recommendation system. This technique can do two things for us, one is efficiently finding users current location and the condition of device and this can be done through decision tree and hence more efficient that existing model. This system pre-processes the information from device and predefined behavior of users and formats the decision tree and the decision tree will be send to Emergency cloud and the cloud then will take the action and broadcast the rescue alerts to team and nearby people. Our study also considers that requiring the user to constantly update their form of transportation is uncomfortable. Therefore person mode of transportation is automatically detected. The detection is done through smartphone. The application can be used as real time mobile application providing rescue operations to needy users. The research can be extended to improve content aware recommendation system and to make it more efficient in case of execution time by introducing more user behavior parameters.

REFERENCES

[1] A Survey of Mobile Cloud Computing Architecture, Applications, and Approaches Hoang T. Dinh, Chonho Lee, Dusit Niyato, and Ping.

[2] I'm feeling LoCo: A Location Based Context Aware Recommendation System Norma Saiph Savage, Maciej Baranski, Norma Elva Chavez, Tobias Höllerer University of California, Santa Barbara, Computer Science Department Universidad Nacional Autonoma de Mexico, Facultad de Ingenieria, Departamentode Ingenieria en Computacion

[3] C. Wang, Q. Wang, K. Ren, and W. Lou, Privacy-preserving public auditing for data storage security in cloud computing, "in IEEE INFOCOM, 2010, pp. 1-9.

[4] S. George, W. Zhou, H. Chenji, M.Won, Y. Lee, A. Pazarloglou,R. Stoleru, and P. Barooah, Distressnet: a wireless ad hocand sensor network architecture for situation management in disaster response," *IEEE Communications Magazine*, vol. 48, no. 3, pp. 128-136, 2010.

[5] Context Aware Recommendation Algorithm incorporating time information, Hongtao Yu, Aimei Li, Fuzhi Zhang. School of Information Science and Engineering, Yanshan University, China

[6] R. SONG, S. HE, and L. ZHANG, Optimum transit operations during the emergency evacuations," Journal of Transportation Systems Engineering and Information Technology, vol. 9, no. 6, pp. 154-160, 2009.

[7] L. Chu and S. Wu, An integrated building fire evacuation system with rfid and cloud computing," in Seventh International Conference on Intelligent Information Hiding and Multimedia Signal Processing (IIH-MSP), 2011, pp. 17-20.

[8] K. Lorincz, D. Malan, T. Fulford-Jones, A. Nawoj, A. Clavel,V. Shnayder, G. Mainland, M. Welsh, and S. Moulton, Sensor networks for emergency response: Challenges and opportunities," IEEE Pervasive Computing, vol. 3, no. 4, pp. 16-23, 2004.

[9] T. Fujiwara, H. Makie, and T. Watanabe, A framework fordata collection system with sensor networks in disaster cir-cumstances," in International Workshop on Wireless Ad-Hoc Networks, 2004, pp. 94-98.

[10] H. Jang, Y. Lien, and T. Tsai,Rescue information system for earthquake disasters based on manet emergency communication platform," in Proceedings of the 2009 International Conference on Wireless Communications and Mobile Computing: Connecting the World Wirelessly, 2009, pp. 623-627.

[11] W. Ying, C. Yi, and Z. Jinkui, The application of rbf neural network in earthquake prediction," in International Conference on Genetic and Evolutionary Computing, 2009, pp. 465-468,

[12] 11. K. Pulli, W. Chen, N. Gelfand, R. Grzeszczuk, M. Tico,R. Vedantham, X. Wang, and Y. Xiong, Mobile visual computing," in International Symposium on Ubiquitous Virtual Reality,2009, pp. 3-6.

[13] 12. Q. Duan, L. Wang, C. Knutson, and D. Zappala, Autonomous and intelligent radio switching for heterogeneous wireless networks," in *IEEE International Conference on Mobile Ad Hoc and Sensor Systems*, 2008, pp. 666-671.

[14] 13. P.Pawelczak, R. Venkatesha Prasad, L. Xia, and I. Niemegeers, Cognitive radio emergency networks-requirements and design ,"in IEEE International Symposium on New Frontiers in Dynamic Spectrum Access Networks, 2005, pp. 601-606.

[15] 14. M. Stecca and M. Maresca, An architecture for a mashup con-tainer in virtualized environments," in International Conference on Cloud Computing *(CLOUD)*, 2010, pp. 386-393.

[16] 15. Akdogan, U. Demiryurek, F. Banaei-Kashani, and C. Shahabi, Voronoi-based geospatial query processing with mapreduce," in IEEE International Conference on Cloud Computing Technology and Science (CloudCom), 2010, pp. 9-16.4462