International Journal for Modern Trends in Science and Technology, 8(09): 143-145, 2022

ISSN: 2455-3778 online
DOI: https://doi.org/10.46501/IJMTST0809029
Available online at: http://www.ijmtst.com/vol8issue09.html

Rescue Me –A Smartphone Based Disaster Relief Self Rescue System

V Meghana [1] | K.Lakshmana Reddy [2]

[1]Master of Computer Applications (MCA), SVKP &Dr K S Raju Arts & Science College(A), Penugonda, W.G.Dt., A.P, India
[2]Associate Professor in Computer science, SVKP &Dr K S Raju Arts & Science College(A), Penugonda, W.G.Dt., A.P, India

To Cite this Article
V Meghana and K.Lakshmana Reddy. Rescue Me –A Smartphone Based Disaster Relief Self Rescue System. International Journal for Modern Trends in Science and Technology 2022, 8(09), pp. 143-145. https://doi.org/10.46501/IJMTST0809029

Article Info
Received: 22 August 2022; Accepted: 12 September 2022; Published: 17 September 2022.

ABSTRACT

Recent ubiquitous earthquakes have been leading to mass destruction of electrical power and cellular infrastructures, and deprive the innocent lives across the world. Since, many people could be trapped under the debris,the victims may have a large chance to survive if they are located and rescued within "Golden 72 hours".

To utilize these 72 hours efficiently , we proposed a smartphone-based self rescue system, Rescue Me to assist the operations of disaster rescue. The basic idea of Rescue Me is that a set of smartphones carried by survivors buried under the debris of infrastructure forms into a one hop network and sends out distress signals in an energy efficient manner to nearby rescue teams. Thus, the survivors got rescued safely.

KEY WORDS:Wi-fitethering , Bluetooth wireless technology, one-hop network , Router server , Attacker,GPS.

1. INTRODUCTION

Unexpected natural disasters such as tornadoes, earthquakes, hurricanes, and tsunamis have been rising dramatically in recent years. In particular, earthquakes tremendously kill innocent lives and damage the environment around the globe, and the epicenter of an earthquake can occur anywhere and now no place would be safe from ubiquitous earthquakes. For example, a 5.6-magnitude earthquake struck Oklahoma and impacted six neighboring states in the U.S. on September 04, 2016 .

After the disaster, it was impossible for disaster victims to utilize their communication devices, such as smart phone, tablet, or laptop, to notify their families and friends of their safety and confirm the safety of their loved ones since the communication infrastructures were physically damaged or lacked the energy necessary to operate. If aseverely injured person does not receive care or medical treatment quickly, the probability of survival rapidly decreases.

On the other hand, smartphones have become an essential electronic device that people always carry for communication and social connection, or place them where they can be easily and immediately accessed. Thus, with the increasing proliferation of smartphones, they can be assumed to be abundantly available among

the disaster victims and act as valuable resources to coordinate rescue operations.

2.LITERATURE SURVEY

The research of Hossain, Ray and Sinha (2016) presents a smartphone-assisted victim localization method in which smartphones belonging to trapped victims and other people in disaster affected areas can self-detect the occurrence of a disaster incident by monitoring the radio environment and can self-switch to a disaster mode to transmit emergency help messages with their location coordinates to other smartphones nearby. To locate other neighboring smartphones also operating in the disaster mode, each smartphone runs a rendezvous process. As Zamora, Suzuki and Kashihara (2017) noted, an application, also referred to as SOSCast, is proposed to propagate SOS messages from trapped survivors through a direct communication between smartphones. By collecting SOS messages that include significant information such as their name, state, and location, rescuers can estimate the locations of the survivors.Without relying on any infrastructure, the research of Al-Sadi and Awad (2017) presents a new algorithm that allows the smartphones of the rescuers and victims to seamlessly collaborate in order to estimate the locations of the victims by using both the received signal strength indicator of the Wi-Fi signals and the GPS information of the rescuers' smartphones. Hossain and Ray (2018) propose a smartphone and IoT devices-assisted emergency and recovery method in a post-disaster environment, where smartphones can utilize the IoT devices in the disaster affected areas to successfully relay the emergency messages to other smartphones.

3.PROBLEM STATEMENT

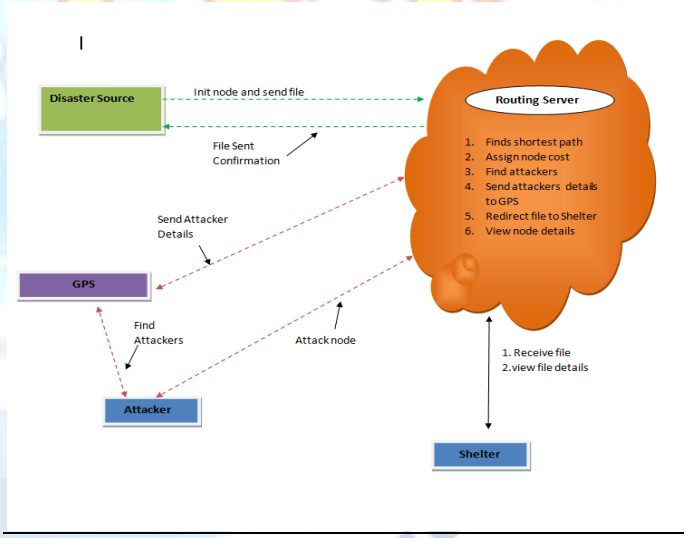
In previous work we used a smartphone-based post disaster management mechanism in the disaster affected area using the concept of Wi-Fi tethering where smartphone in the affected areas may turn themselves into temporary Wi-Fi hotspot to provide internet connectivity and important communication abilities to nearby Wi-Fi enabled user device. After that, novel architecture called energy aware disaster recovery network using Wi-Fi tethering is proposed to create the desired network infrastructure using wireless devices.

By bridging the gap among different kinds of wireless networks, a system called TeamPhone is proposed to provide smartphones the capabilities of communications in disaster recovery. TeamPhone consists of two components: a messaging system and a self-rescue system. The messaging system integrates cellular networking, ad-hoc networking and opportunistic networking seamlessly, and enables communications among rescue workers. The self-rescue system energy-efficiently groups the smartphones of trapped survivors and sends out emergency messages so as to assist rescue operations.

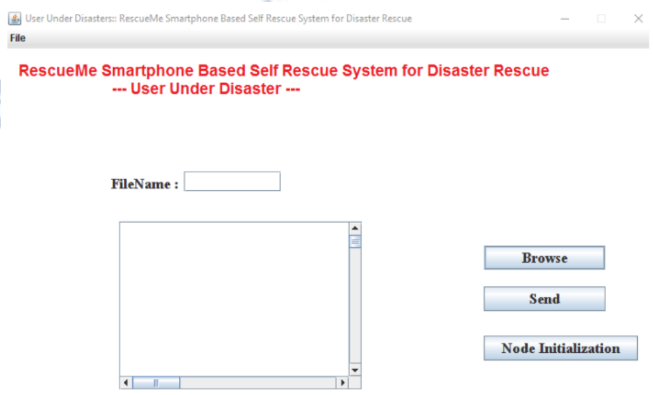
Disadvantages:

- ✓ The TeamPhone also does not consider that each smartphone of trapped survivors may carry different amounts of residual energy, and the smartphone with less residual energy may turn off quickly because of frequently broadcasting emergency messages.

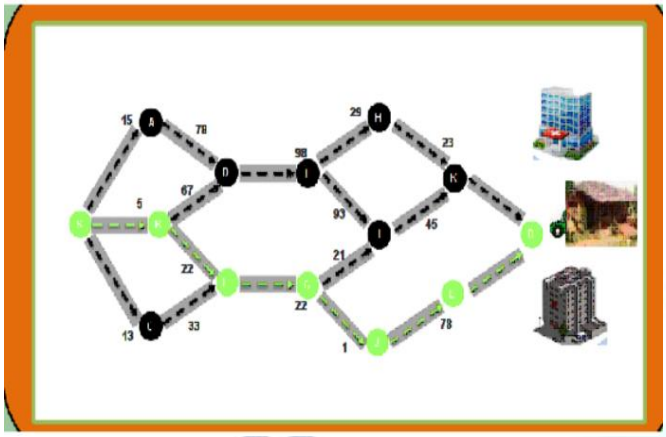
4.SYSTEM ARCHITECTURE



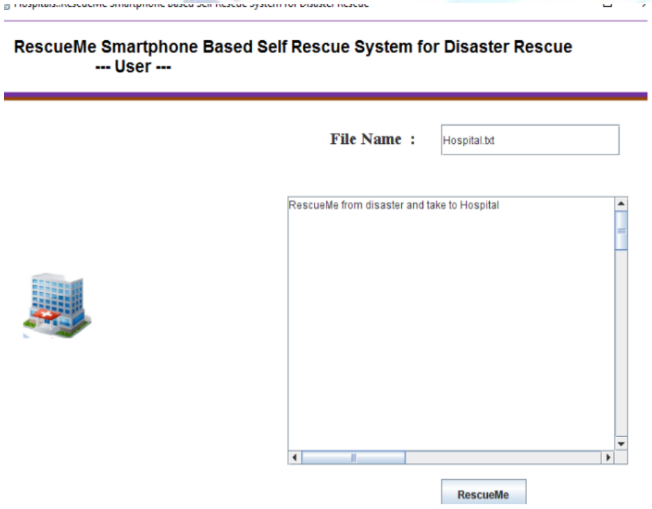
5.RESULTS:



Router server showing the path in which the file reaches the shelter:



File reached to shelter:



6.CONCLUSION:

In this paper, we proposed a smart phone-based self rescue system to assist the operations of disaster rescue and relief. The basic idea of Rescue Me is that a set of smart phones carried by survivors trapped or buried under the collapsed infrastructure forms into a one-hop network and sends out distress signal in an energy-efficient manner to nearby rescue crews to assist rescue operations. We evaluated the proposed approach through extensive simulation experiments and compared its performance with the existing scheme Team Phone. The simulation results showed that the proposed approach can significantly reduce the schedule vacancy of broadcasting distress signal and improve the discovery probability with very little sacrifice of network lifetime, and indicate a potentially viable approach to expedite disaster rescue operations.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

REFERENCES

[1] "Improved Response to Disasters and Outbreaks by Tracking Population Movements with Mobile Phone Network Data: A Post-Earthquake Geospatial Study in Haiti," PLoS medicine, vol. 8, no. 8, 2011.

[2] Z. Lu, G. Cao, and T. L. Porta, "Networking Smartphones for Disaster Recovery," in Proc. IEEE PerCom, 2016, pp. 1–9.

[3] Pal and K. Kant, "E-Darwin2: A Smartphone Based Disaster Recovery Network using WiFi Tethering," in Proc. IEEE CCNC, 2018, pp. 1–5.

[4] M. Raj, K. Kant, and S. Das, "E-DARWIN: Energy Aware Disaster Recovery Network using WiFi Tethering," in Proc. IEEE ICCCN, 2014, pp. 1–8.

[5] S. Ray, R. Sinha, and S. Ray, "A Smartphone-based Post-Disaster Management Mechanism Using WiFi Tethering," in Proc. IEEE ICIEA, 2015, pp. 966–971.

[6] Hossain, S. Ray, and R. Sinha, "A Smartphone-assisted Post-Disaster Victim Localization Method," in Proc. HPCC/SmartCity/DSS, 2016, pp.1173–1179.

[7] Al-Sadi and F. Awad, "Smartphone-Assisted Location Identification Algorithm for Search and Rescue Services," in Proc. IEEE ICICS, 2017, pp. 276–281.

[8] C. Pu, S. Lim, C. Jinseok, and J. Byungkwan, "Active Detection in Mitigating Routing Misbehavior for MANETs," Wireless Network(2017), https://doi.org/10.1007/s11276-017-1621-z

Authors Biography

V.Meghana currently pursuing MCA in SVKP & Dr.K.S Raju Arts & Science College affiliated to Adikavi Nannaya University, Rajamahendravaram. His research interests include Data Structures, Web Technologies, Operating Systems, Data Science and Artificial Intelligence.

K.Lakshamana Reddy is working as Associate Professor in SVKP & Dr K S Raju Arts & Science College,Penugonda,West Godavari District, A.P. He received MCA from Andhra University, 'C' level from DOEACC, New Delhi and M.Tech from Acharya Nagarjuna University, A.P. He attended and presented papers in conferences and seminars. He has done online certifications in several courses from NPTEL. His areas of interests include Computer Networks, Network Security and Cryptography, Formal Languages and Automata Theory and Object Oriented programming languages.