ERS Using Distance Learning Algorithm

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Abstract: *Accidents are unplanned and unforeseen events. People try hard to do things properly so that everything is fine, because no one likes accidents; But it's possibility can't be ruled out. Whenever any accidents occur, people get hurt and they are in need of quick medical assistance. In such situations, ambulances play a vital role in saving the victim as their life depends on it. If the ambulance reaches the victim in time, he has a high chance of recovering qucikly, but if it's late, it can be fatal. For an ambulance to reach the accident spot, it needs to be called by someone nearby the accident spot. Currently whenever any accident or mishap happens on road, it takes time for people to manually call the hospital and then ask them to send an ambulance. Also the ambulance is obviously away from the accident spot so it takes time for it to reach to the patient. Moreover, if it gets stuck in traffic, that adds-up to the delay which can be fatal for the victim. So there is need of such a solution that can be quick and will provide immediate help to the victim in such emergencies and will also impact the system of emergency rescues. Since people are surrounded by technology now-a-days, it can also be used to improve the system of medical emergency rescue operations and hence reduce the response time.*

Keywords: *Request Button, Maps, Autorickshaw, Rescue, Distance Learning.*

1. Introduction

As far as the word 'rescue' is concerned, it means saving someone's life and treating their injuries / pain in life-threatening situations like accidents, health issues, natural and man-made disasters, etc. In present time whenever an incident or mishap happens on road, it takes time for person to manually call the hospital and then ask them to send an ambulance. Gradually the ambulance is away from the accident spot so it takes time for it to reach the victim. Moreover, if ambulance gets stuck in traffic,which then adds-up to the delay in time, which can be fatal for the victim.So a solution is needed that can be quick and will provide immediate help to the victim in such emergencies and will also impact the system of emergency rescues.

Main part of plan is to use autorickshaws instead of ambulances because here in India, autos are easily accessible than ambulances and ambulance usually takes a lot of time to reach the victim. Also, to make it more smart, an app is designed and developed which is programmed to help an accident victim by alerting nearby auto rickshaw drivers to come to the victim's aid. This is supposed to be a one click service which sends notification to all available nearby autos and rescue the victims and save the life before time runs out.

Currently all the emergency rescue systems are dependent on ambulances which are already limited in numbers, which is why their availability is low and time consuming, so our system can totally revolutionize the rescue operations in these aspects. Since the auto-rickshaws are compact in size than most ambulances, they can go in the smallest areas possible, increasing their efficiency more. This is how vast the scope of this modified system can be. The end objective of this system is to aid the victim in emergency as

immediately as possible and give the other gatherers some option to help the victim in emergency.

2. Literature Review

[1] **Shortest Path Calculation Algorithms(Distance Base Algorithms) for Geographic Information Systems.**

The authors of this paper have observed that finding shortest path to reach the destination in a city is a major problem for transportation which leads to high traffic flow and congestions. So the study in this paper aims to implement shortest path searching algorithms by comparing the two famous distance learning and calculation algorithms : the Bellman-Ford's Algorithm and the Dijkstra's Algorithm. For the purpose of implementation and testing, authors have used the roads of Bandung city for case study. Two points in the city were marked as source and destination and had several intermediate nodes between them at different points, the concept of graph is used for mapping co-ordinates and the result was then calculated by using Bellman- Ford's and Dijkstra's algorithms. Then their results were compared where both the algorithms successfully showed good results and found best possible routes, but Dijkstra's algorithm was found to be more efficient as it calculated even shorter path than the Bellman-Ford's algorithm.

[2] **An Automated Taxi Booking and Scheduling System**

The author of this research paper[2], Albara Awajan in this paper has created a taxi booking and scheduling system. It is in the form of both application and a website. According to author, in Amman, Jordan's capital city, taxis are more reliable than any other transport systems but there is no proper management and centralisation. So he created a system where he made an application which had several interfaces for people's ease to book taxis and properly manage the system, thereby reducing chaos, saving time and unnecessary fuel consumption. According to his study, 80% of fuel and time can be saved as compared to current systems. With this paper, we understood how to structurize a management based application got some idea to be put in our project.

[3] **Ambulance Tracking System Using Restful Api.**

In this paper[3], authors C. S. Vikas and Ashok Immanuel have developed an application for managing the rescue system, it is called as Ambulance Tracking System. It is made using the RESTful web services API. This API is used for connecting the client end to the database. The functionality of this application is almost as same as the one we are making, except just a small change; The distance between the ambulances and the accident spot and all other other necessary distances are calculated using the latitudes and longitudes. If there are three ambulance there latitude and longitude are going to be compared with all three then will show the one ambulance which is almost the user.. But we decided not to use this method because it can not be accurate at times and there will always be some differences in the actual locations and the location calculated due to rounding off and also as latitudes and longitudes itself is imaginary. Rather we decided to rely and stick on the maps API.

[4] **Automatic Ambulance Rescue System Using Shortest Path Finding Algorithm**

P. Arunmozhi and P. Joseph William in their research paper [4] have put forth a very versatile and unique way to carry out the emergency rescue operations called Automatic Ambulance Rescue System using shortest path finding algorithm. The idea of this scheme is nearly same as many others but the implementation here is totally different. The

implementation is laid in such a way that a minimum possible time is required for ambulance to reach the accident spot and from there to the hospital. The system is totally automatic, as it does the following tasks - whenever an accident occurs, due to vehicle's crash sensor, the accident is detected automatically and location is sent to server. The server not only searches the closest ambulance to the spot but also finds the shortest path between the ambulance, accident spot and the hospital with the help of the shortest path finding algorithm. The server sends this path to the ambulance and in ambulance, GPS finds the location and GSM sends information to emergency center. The ambulance has bio-sensor to sense victim's condition and send to the hospital beforehand with thr the help of zigbee. The system can also control the signalling on the ambulance's path. The is a RF transmitter in the ambulance and RF receiver at the signal, as soon as the transceiver communicate, the signal gets green and there is no need to waste time. With all these possibilities, the system carries out rescue operation in minimum possible time with ease.

3. Proposed System

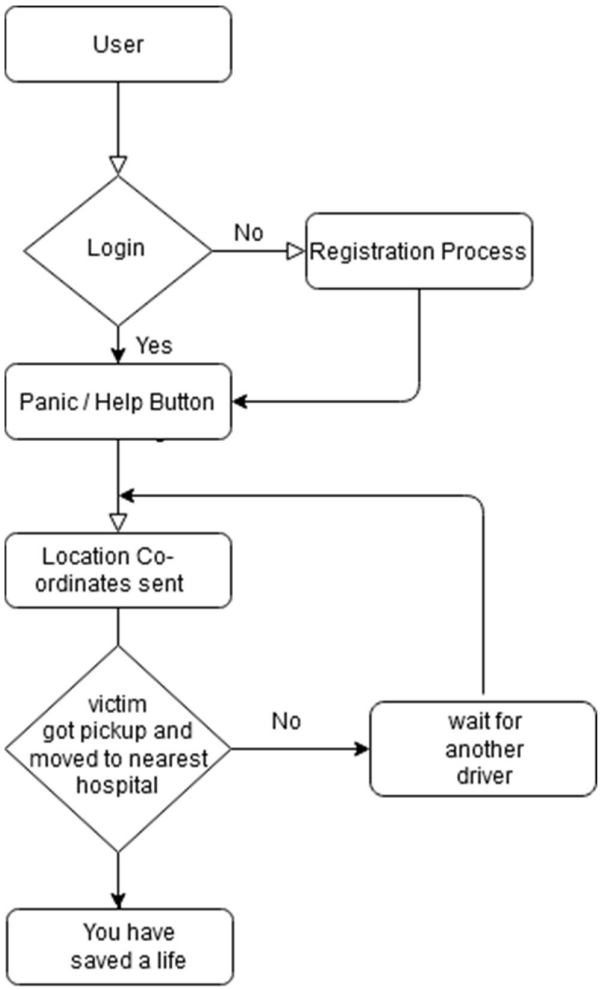

Figure 1. Block Diagram of the Proposed System

The app has two interfaces : one for the victim's side and another for driver's side. At the victim's side, the users can register themselves and then login to the app. Once logged in, there will be a one-click button, which when clicked at the time of accident will fetch the location of the accident spot via GPS using the mapsAPI. Using the distance learning algorithm, the nearest autorickshaw to the accident spot will be alerted and the co-ordinates of the location will be sent to the driver's side of the interface. Incase the driver doesn't approve to help, another nearby auto will get the alert. The autorickshaw will reach the spot and take the needy to the hospital, thus saving a life.

4. Result

Since a majority of population (more than 80%) uses android, an android based application has been made using android studio. Java is used entirely to make the app which is supported by Android KitKat (API21) and above. For database and authentication, google firebase is used. Map has been integrated using Google maps API. Device GPS is employed for fetching user's current location. After days of work, the following results were achieved as shown in the screenshots.

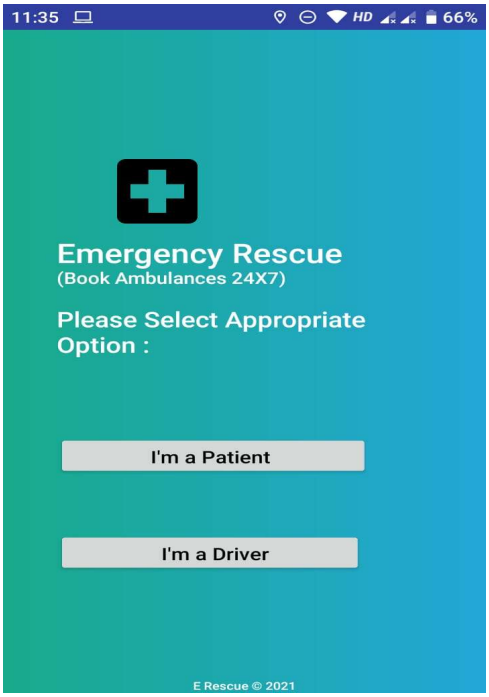

Figure 2: Sign Up/In Screen

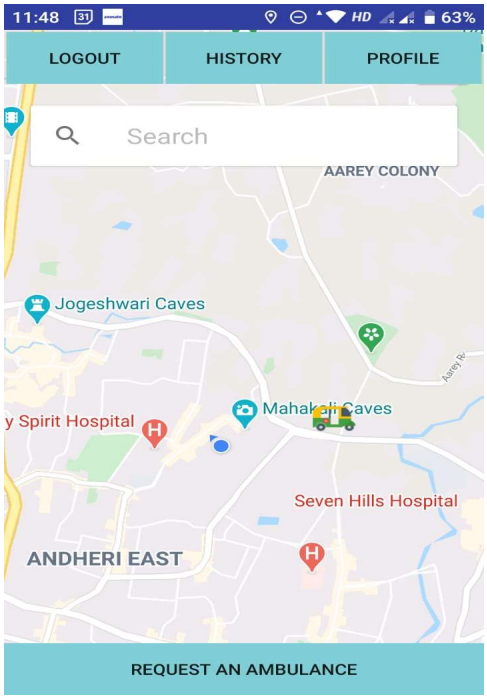

Figure 3:Patient Request Screen

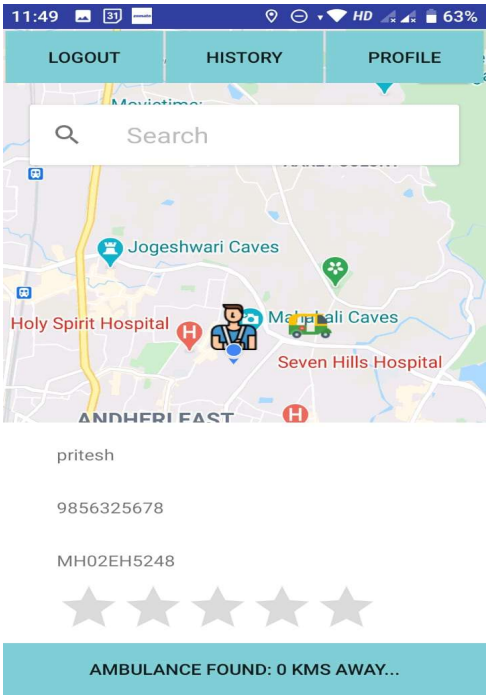

Figure 4:Patient Interface

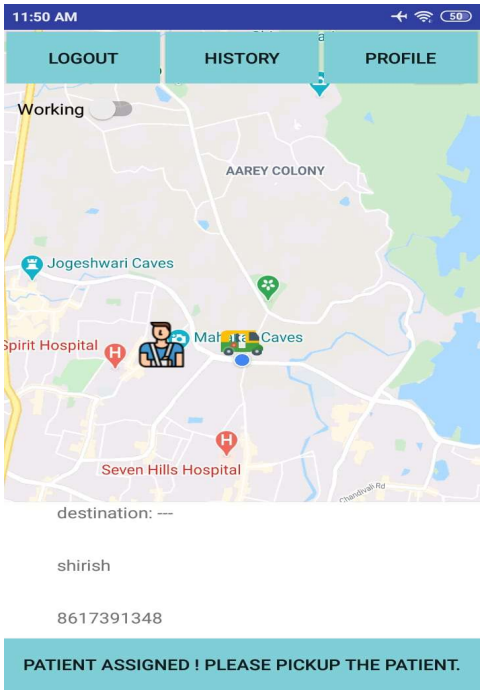

Figure 5:Driver Interface

5. Conclusion and Future work

To summerize, an application was successfully implemented to carry out emergency rescue operations with ease as opposed to the traditional methods. With this application based rescue system, the response time of help will be reduced to great extent and hopefully this application comes to actual use. Also now, atleast nearby watchers at the accident spot have a way to help rather than just starring and clicking photos unnecessarily.

For now, it can be said that this much is enough and the primary purpose for which the project is made is covered. But there is always room for improvements, and there are numerous possibilities that something much more can be added for better functionality. As for the future plans, there is a thought for introducing some kind of reward system where both the helpers i.e. the person who requests help and the driver who takes the victim to the hospital will be rewarded, just to encourage people to help and contribute more to the betterment of the society.

6. References

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