

Route Guide and Safety System

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Abstract: It is a simple React-Native application used to get route guidance for your destination so that you can plan your journey accordingly. The purpose of this project is to design and construct a hand-held wireless tracking device so that the location of a person can be detected. Other than providing route the application can also be used for safety purpose. It focuses on one of the important problems of society that is eve-teasing. It makes the society to be aware of the misbehavior which is happening and to come forward for help. It enables people to be self-dependent and can handle any kind of unpredictable situation. It mainly shares the location based on GPS, (Global Positioning System). Pressing the SOS button it sends the emergency message with time and location to the emergency contacts and nearby police authorities. When the application triggers on the time of travelling it send the location to the emergency contacts with few images taken by the camera on spot, and the Google map URL of person's current location and a siren rings which gives immediate help.

KEYWORDS: React native application, alert system, GPS based tracker, Google maps.



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INTRODUCTION

The purpose of this project is to design and construct a react native application so that the location of a person can be detected. Other than providing route it can also used for safety purpose.

It is really mandatory today for a person to travel alone with ease, safety, and confidence. The best way to reduce chances in becoming a victim of violent crime (robbery, sexual assault, rape) is to identify and call on resources to help you out of unsafe situations. In this paper, we provide such facility so that a person can travel alone and safe. A person who don't know much about travelling will get a facility in which a route guidance will be given to them so that they can reach their destination, helping them to be confident in travelling. This application is designed in such a way to get you a help with minimal and unnoticeable efforts. This application sends the emergency message with time and location to the emergency contacts and nearby police authorities with few images taken by the camera on spot and the Google map URL of person's current location hence providing immediate help. This reduces risk and provides safety when needed.

As the project is made in React-Native environment using react.js and javascript, it focuses on the development of more projects using the web development environment. Most of the React-Native API's are cross platform and will work on platforms like iOS and Android. You can develop complete, full-blown applications that look, run and feel native without writing one line of platform-specific code. Moreover, React-Native is compatible with third-party plugins. To add Google Maps' functionality is simply downloaded as a third party plugin which is then linked with native modules. As the project focus on making a person safe and independent, many other features can further be developed so that more and more people can travel alone and safe.

RELATED WORK

There are numerous works done related to location tracker and alert system using different algorithms in technical world.

Applying Google Maps and Google Street View in criminological research [Christophe Vandeviver] Crime Science volume3, Article number:12(2014)

Online mapping technologies such as Google Maps and Street View have become increasingly accessible. These technologies have many convenient uses in everyday life, but law enforcement agencies have expressed concern that they could be exploited by offenders and might alter existing offending patterns and habits. For environmental criminologists, they have the potential to open up new approaches to conducting research. This paper draws on the results of earlier studies in related fields and a handful of criminological studies to discuss how these online mapping applications can trigger new research questions, and how they could be considered a valuable methodological addition to criminological research.

Android Based Safety Triggering Application [P.Kalyanchakravarthy]-

This paper describes a few Safety Triggering applications being developed and its successful implementation with tested results. The application has target users those sections of the people that surprisingly fall under a situation where instant communication of their whereabouts becomes indispensable to be told to certain authorized persons at remote end. This application main purpose is for women's safety. When we feel that we are in emergency situation, for example travelling alone in the Auto/Cab at night time we can use this application so that on one click we can send our location to our family members and to any police stations continuously until we stop with password based button.

An Android Application For Women Safety [Bramarambika Thota and Udaya Kanchana Kumar.P]

The usage of smart phones equipped with GPS navigation unit have increased rapidly from 3% to quite 20% within the past five years. Hence, a smart phone is often used efficiently for private safety or various other protection purposes especially for ladies. This paper presents Sauver, a private safety application developed for smart phones of android platform. This app are often activated by one click when the user feels she is in peril .This application communicated the user's location to the registered contacts for each few seconds in the form of message. Thus, it acts sort of a sentinel following behind the person till the user feels.

METHODOLOGY

As stated in the objective this react native application provides route guidance for travelling and SOS messages in case of emergency. At the beginning, we researched and analysed many related works and papers. We collected useful information regarding google maps, GPS, location tracking and sending SOS messages.

[1] System Requirements

- React Native
- Firebase
- Expo
- Google cloud Api's
- Android device
- Google Maps

[2] Flow of application

The flow of the application goes in following way.

Login into application

The metro riders register into the application and provide their credentials. Once they are registered their data will be stored in the database and they can then login into the application.

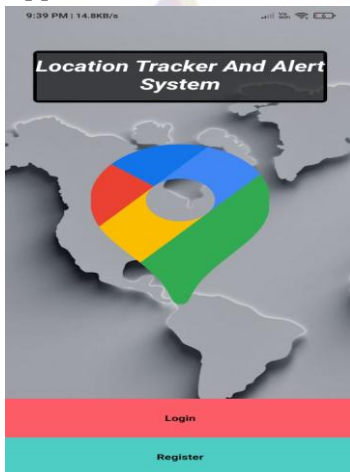


Fig: 1 Home Page

Tracing location on Google map

When we enter the origin and destination locations, the markers will be created on the positions, on Google Map. A polyline will also be created between the locations so that the exact route can be traced. This will show all the nearby places along the route and near destination.

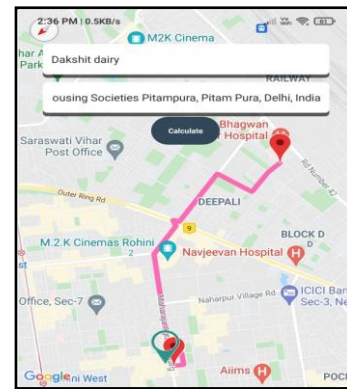


Fig: 2 A polyline between origin and destination

Getting alert before destination

The user needs to fill their initial and final destination. The application will take the initial position of the user using GPS of the android device on which the application is running. Using Places Api the application will detect the initial and final positions. Clicking calculate button will then calculate transit distance, transit duration, total fare, from, to. When the distance to the destination will be less than 400 m an alert will be provided to the rider. Also, distance left and time left will be upgraded at an interval of 1 min.

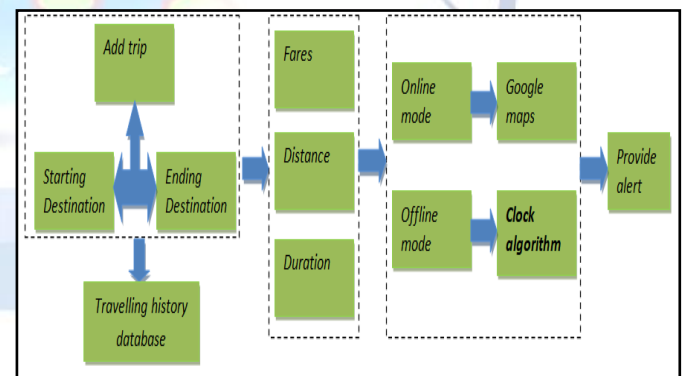


Fig: 3 Flowchart of how application provides alert.

Sending SOS messages

In emergencies, the SOS button will help in sending SOS messages to the nearby police authorities and emergency contacts. This SOS message will contain a message informing that the rider is in danger with time and location(exact Google map URL), and few images taken by the camera on the spot. This system is also integrated with mobile speakers so that loud noise is

produced to alert the people nearby.

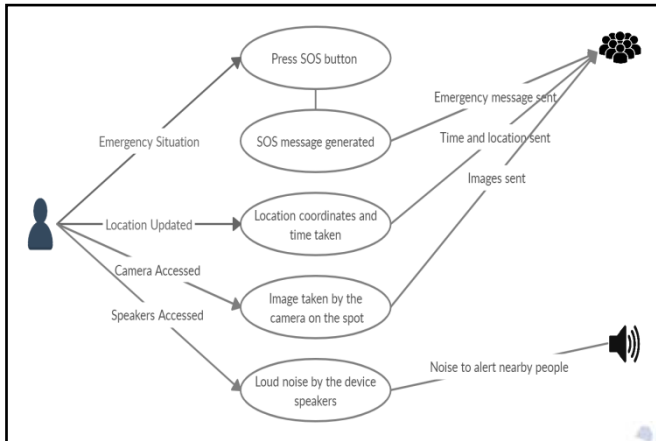


Fig: 4 Use case diagram of providing SOS messages

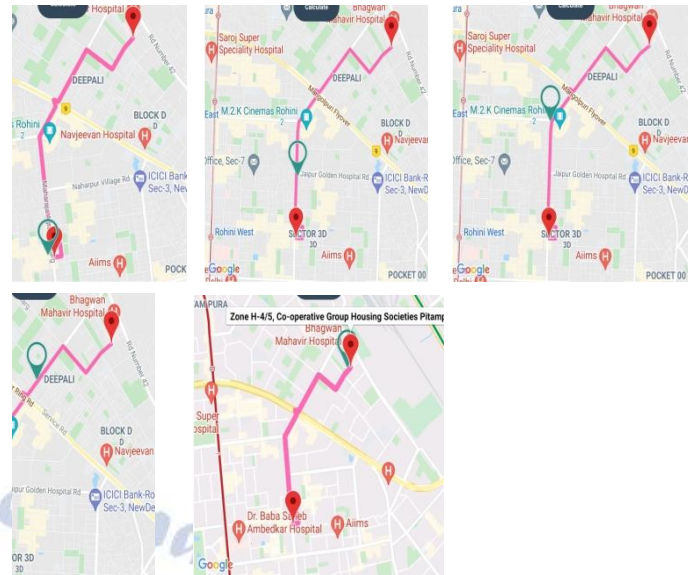


Fig: 7 Intermediate results

RESULTS

[1] Getting Alert before destination

- **Initial result** - Initially when origin and destination are filled the app calculates total distance and duration (using distance matrix api) and displays it. Two markers (origin marker and destination marker) will also be shown with pink color polyline. (Fig: 5)
- **Intermediate results**- These results show distance left and time left. Distance left and time left changes every 1 min. Also every second a current location marker (green marker) will change its place according to the route taken. (Fig: 7)
- **Final result**- Final result shows an alert when 400 m left. (Fig: 6)

[2] Sending SOS messages

On clicking SOS button camera pops up and on again clicking SOS button picture is clicked by the camera (Fig: 8) and sent to the emergency contacts (Fig: 9) with location of the user and an emergency message (Fig: 10).

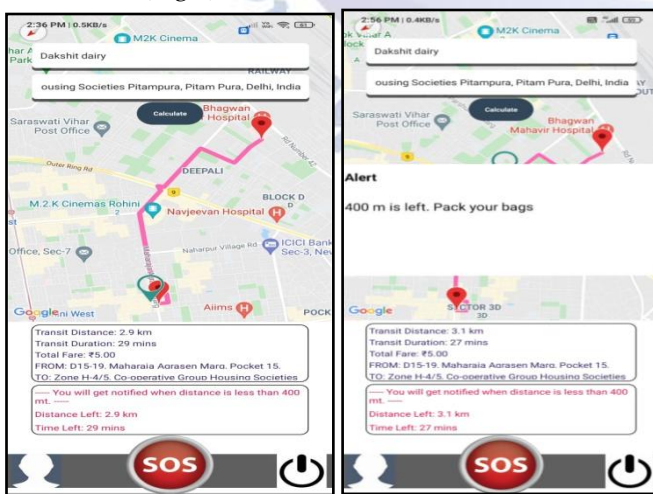


Fig: 5 Initial results

Fig: 6 Final results

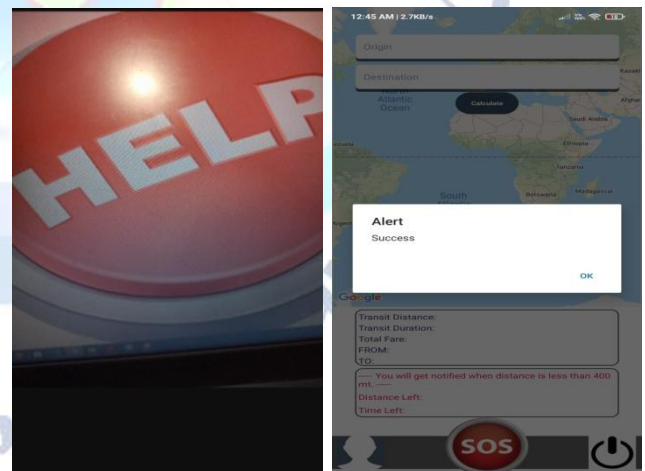


Fig: 8 Picture clicked

Fig: 9 Picture sent successfully

The Emergency message contains a sentence stating "Hi I am in emergency, Need help", location of the user (a Google Map URL) and an image URL. Message recipient after clicking on URL can see the picture clicked by the camera (Fig: 11). Also by clicking on Google maps URL google maps will open showing users location when the message was sent (Fig: 12)

The message will be received by three recipients (Fig: 13).



Fig: 10 Messages Delivered successfully

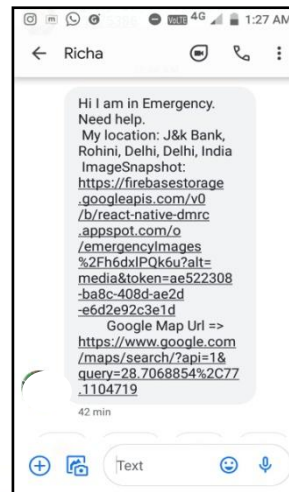


Fig: 13 Message received successfully

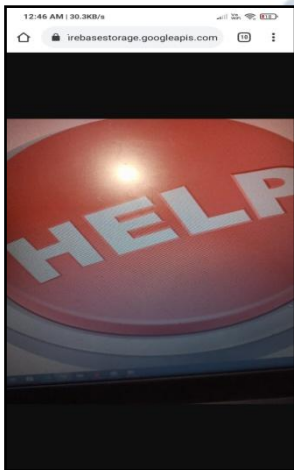


Fig: 11 Image after Clicking on image URL

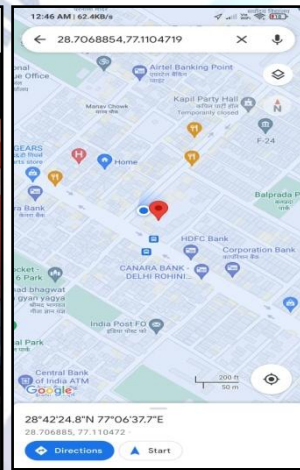


Fig: 12 Image after Clicking on image URL

CONCLUSION

In this project a react native application is made to run on Android platforms. The application will provide an update of distance left and time left for their destination after every one minute and provides the alert before 400 m. The use of Google maps will guide the user along its path. The SOS messages are sent to the emergency contacts with few images. We had worked on the application and got accurate results.

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