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Safe Trek Android App using built-in Accelerometer and Magnetometer

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ABSTRACT

Trekking is a hobby to some people. But it has some risk also. The main risk is that we may miss somewhere else as we don't know the direction. There are some mobile apps which provide direction using GPS. The disadvantage is that in the dense forest signal strength is weak and also GPS doesn't provide interior routes. For that we have proposed an idea that the paths we are travelling are recorded by automatically drawing line on the screen using built in accelerometer of the android phone. Instead of using network to find path, our idea is to find path by using built-in accelerometer and magnetometer. The accelerometer will record the distance covered by the user and the magnetometer will trace the directions of the user. The app will continuously record both the information and when the user needs to return to their path it will give information recorded so far. The user can easily backtrack to their path.

Keywords: *Magnetometer, Accelerometer, Trekking*

I. INTRODUCTION

The main risk is that we may miss somewhere else as we don't know the direction. There are some mobile apps which provide direction using GPS. The disadvantage is that in the dense forest signal strength is weak and also GPS doesn't provide interior routes. For that we have proposed an idea that the paths we are travelling are recorded by automatically drawing line on the screen using built in accelerometer of the android phone. In our idea without using the network we can track the path using the built-in accelerometer and magnetometer of the mobile phone. Accelerometer will record the distance travelled by the user and magnetometer will provide the direction in which the user is travelling. We can use this idea when we are travelling in the interior area of the forest or the area in which we are not having network. Accelerometer and magnetometer will continuously record the distance and the direction travelled by the user and will provide the information to them when the user returns to their path. By this, the user can easily backtrack to their path.

II. Application Design

A. Software Used

- Eclipse IDE: Eclipse is an integrated development environment (IDE) used in computer programming, and is the most widely used Java IDE. It contains a base workspace and an extensible plug-in system for customizing the environment. Eclipse is written mostly in Java and its primary use is for developing Java applications.

B. Components Used

- Android phone with Built-in Accelerometer and Magnetometer.

  1) Built-in Accelerometer: The working of accelerometer is to detect the acceleration of the phone.

  2) Built-in Magnetometer: The working of magnetometer is to find the direction.

C. Block Diagram

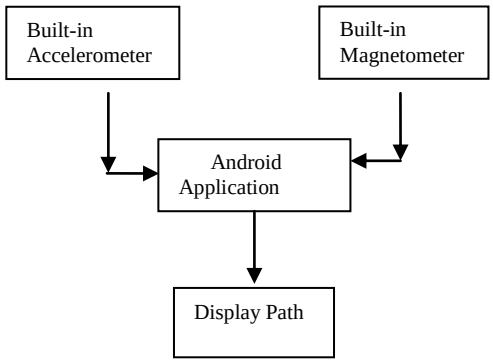

Figure 1. Block Diagram of the operation of Built-in Accelerometer and Magnetometer and the Application

III. PROPOSED SYSTEM

For the location of the path and direction we use the built-in accelerometer and magnetometer of the mobile. The accelerometer is used for measuring the acceleration of a moving body. It helps us to the find the movement of the mobile phone while we are travelling. With the movement of the mobile we can find the distance travelled so far. The magnetometer is used for finding the direction. The magnetometer of the mobile provides the direction in which we have to move.

Figure 2. App showing current Direction and Distance

When we place our mobile on the flat surface, the accelerometer will show the reading of the x-axis, y-axis and z-axis as zero. The y-axis and z-axis value will be shown when we place our mobile in the upward direction. When we tilt our mobile we can get the x-axis and z-axis values.

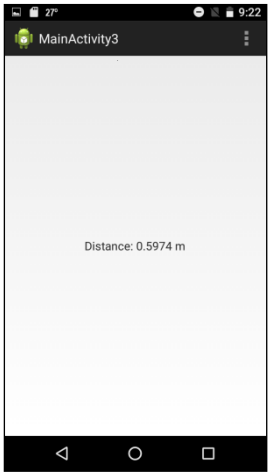

Figure 3. App showing total distance travelled.

We can measure the distance travelled so far and the direction in which we have to move when we cannot track the return path. When we are travelling we have to start our app and we can move in our path.

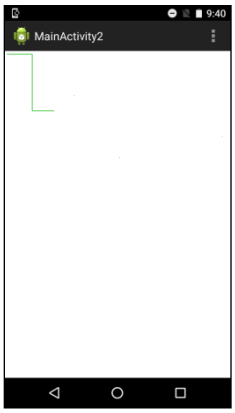

Figure 4. App showing the path travelled

When we want to return to our destination and if we don't know the path we can use the app and can track the path and return to the starting point.

IV. LITERATURE SURVEY

The application is entirely a new one and different from the app that we are using earlier. In the existing app they use the GPS of the mobile to track the path and the direction in which we have to move and they need network for tracking the path. But in our app we are using the built-in accelerometer and magnetometer of the mobile for tracking the path and the direction in which we have to move. It is helpful when we are going for trekking and when we lost our path we can use this app. So our project is different from other project in

tracking the path without the use of internet connection and if we don't have network in that area. This application can be developed into a software as it has more advantages and it is more innovative than other previous existing methods. The main difference between the existing app and this app is that we are not in the need of any network and internet connection in tracking the path and direction in which we have to move. Thus this app will be more useful in tracking the path and direction in which the user has to move.

V. CONCLUSION

This app will be an excellent method for tracking the path and the direction in which we have to move if we lost our way. It does not need any internet connection for the location of the path and the direction in which we have to move. So it is concluded that we can use in use this app in the android phone which have the built-in accelerometer and magnetometer on them.

VI. References

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