Pedis Alert: A Review

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ABSTRACT
The name of our project is "PEDISALERT" which deals with the pedestrian accidents caused to high speed vehicle aiming towards him. This feature coordinates the pedest's position, via GPS (android), with the speed of the car so as to alert pedestrian about the particular vehicle. This helps drivers maintain a safe driving speed in order to prevent accidents. Newer versions may use a camera to read speed limit signs.

I. INTRODUCTION

The name of our project is "PEDISALERT" which deals with the pedestrian accidents caused to high speed vehicle aiming towards him. This feature coordinates the pedest's position, via GPS (android), with the speed of the car so as to alert pedestrian about the particular vehicle. This helps drivers maintain a safe driving speed in order to prevent accidents. Newer versions may use a camera to read speed limit signs.

A more advanced version of this feature, called intelligent speed adaptation, would be capable of slowing down the car automatically if a driver passes the speed limit. Drivers would be able to override most versions of intelligent speed adaptation. This feature currently is being researched in Europe and the United States, among other countries. When a pedestrian is knocked down by an oncoming vehicle, the force from the initial impact causes the primary injury, often on the lower limbs. At over 50km/h, the speed of the vehicle could cause the victim to be thrown over the bonnet and into the windscreen – this leads to secondary injuries. Tertiary injuries follow when the victim is thrown over the roof of the vehicle and lands at the back. Another vehicle could hit the victim at this point, causing quaternary injuries. In some cases, when the driver suddenly applies brakes, the victim could be thrown outward and the vehicle may come to a stop over the victim.

II. METHODOLOGY

The global positioning system (GPS) unit compares a database of known road speed limits against your actual speed through the use of a built-in speed sensor. Some versions may also track school and work zones; future versions may be able to read speed limits though a camera on the search index of each image. And finally, the system should give the best matching solutions as the output.

Speed Distance Time Formula

Distance is something that tells how far the body travels while time tells how long it takes to travel. The speed is something that decides at what rate the body travels using distance and time. To relate all these three quantities there is a general formula known as speed distance time.

Speed Distance Time Formula is given by

SPEED= DISTANCE/TIME

The speed distance time formula tells a lot about how the distance and time interval varies if the speed rate of any body in motion changes. If any of the two quantities among these three are known we can get to know the unknown quantity using the above formula

Techniques to calculate Speed

Mainly there are two ways to calculate the speed from mobile phone.

1.   Calculate speed from Accelerometer
2.   Calculate speed from GPS Technology

If using Accelerometer and GPS Technology to calculate speed you must enable data connection and GPS connection.

Here we are going to calculate speed using GPS connection. In this method we check how frequently the GPS Location points are changing during single time period. Then if we have the real distance between the two geo locations points we can get the speed using the expression Speed = distance/time But getting the distance between two location points wouldn't be easy. The distance between two geo points is different from both place

to place and angle to angle. So we have to use "Haversine Algorithm"

Literature Survey

Various researchers have tried to monitor driver behavior using both dedicated sensors deployed inside car, roadside and smartphone inbuilt sensors. Singh et al. developed an android based application. This application collects data from accelerometers, GPS and also record sounds with the help of microphone, and then data is combined and analyzed to detect rash driving patterns. The various patterns such as speed breaker, lane-change left/right, left/right turn, sudden breaking and sudden acceleration were analyzed. Fazeen et al. have also proposed an innovative application using a mobile smartphone that are integrated inside an automobile to evaluate driver style. They have used the three-axis accelerometer of an Android-based smartphone to record and analyze various driver behaviors and external road conditions that could potentially be hazardous to the health of the driver. They have utilized x-axis and y-axis accelerometer data to measure the driver's direct control of the vehicle as they steer, accelerate, and apply the brakes. Chigurupa et al. developed an android application which uses data from accelerometer sensor, GPS sensor and video recording is done with the help of camera to give rating to the driver. The feedback can be used to aware the driver and improve performance. The range of acceleration or deceleration values is given for the safe driving. Whenever the accelerometer values exceed the safe limits it would be considered as an event. Johnson et al. proposed an approach for predicting driving style. They categorized driving style into normal, aggressive and very aggressive. They collect data from various sensors (accelerometer, gyroscope, magnetometer, GPS, video) and fused related data into a single classifier based on Dynamic Time Warping (DTW) algorithm. Their system is known as MIROAD: A Mobile-Sensor-Platform for Intelligent Recognition of Aggressive Driving, The system can provide audible feedback if a driver's style becomes aggressive as well as the information leading up to an aggressive event.

SMART PHONE SENSORS

This section describes the brief description of various types of sensors present in Smartphone which are currently being used in analyzing driver behavior. a. Accelerometer An accelerometer is an electromechanical device that will measure acceleration forces. An accelerometer is a sensor which measures the tilting motion and orientation of a mobile phone. b. Gyroscope detects the current orientation of the device, or changes in the orientation of the device. Orientation can be computed from the angular rate that is detected by the gyroscope. It basically works on the principle of angular momentum. It is expressed in rad/s on 3 axis. c. Global Positioning System (GPS) GPS is a satellite based Navigation tracking often with a map showing where you have been. It gives us the value of longitude and latitude which determines the point of location on earth. d. Camera is a device used to capture images. In smartphone, camera can be both used to capture images and video chat. In detecting various human behavior camera plays a vital role as it captures the live image of a human. e. Gravity Sensor The gravity sensor provides a three dimensional vector indicating the direction and magnitude of gravity. f. Rotational Vector sensor. The rotation vector represents the orientation of the device as a combination of an angle and an axis, in which the device has rotated through an angle around an axis (x, y or z).

Tool Windows

Instead of using preset perspectives, Android Studio follows your context and automatically brings up relevant tool windows as you work. By default, the most commonly used tool windows are pinned to the tool window bar at the edges of the application window.

- To expand or collapse a tool window, click the tool's name in the tool window bar. You can also drag, pin, unpin, attach, and detach tool windows.
- To return to the current default tool window layout, click Window > Restore Default Layout or customize your default layout by clicking Window > Store Current Layout as Default.
- To show or hide the entire tool window bar, click the window icon 🔲 in the bottom left-hand corner of the Android Studio window.
- To locate a specific tool window, hover over the window icon and select the tool window from the menu.

III. ANALYSIS

Document key expressions have empowered quick and accurate searching for a given archive from a huge text

SYSTEM ANALYSIS
PRELIMINARY INVESTIGATION

Things are expected to get even more critical since the company's growing numbers of clients and related requirements have been projected to demand a massive number of employees in the coming future from the past and the today's date. Such events and projections have forced a strong need for modification in the current way of handling activities.It is better to implement the latest of it rather than to go through the pain of updating the system over and over again. Also the solution would be developed by in-house developers. Their time have to be managed with their other client dependent schedules.

FEASIBILITY STUDY

Depending on the results of the initial investigation, the survey is expanded to a more detailed feasibility study. Feasibility study is a test of system proposal according to its workability, impact on the organization, ability to meet user needs, and effective use of resources. The objective of the feasibility study is not to solve the problem but to acquire a sense of its scope . During the study, the problem definition is crystallized and aspects of the problem to be included in the system are determined. Consequently, costs and benefits are described with greater accuracy at this stage.

TECHNICAL FEASIBILITY

This involves financial considerations to accommodate technical enhancements. If the budget is a serious constraint, then the project is judged not feasible.

ECONOMICAL FEASIBILITY

With the help of banking application it will lead to decrease in cost of opening and maintaining offices which will be more than the cost of developing and maintaining the Application.

OPERATIONAL FEASIBILITY

This Application is very easy to operate as it is made user friendly. Main consideration is user friendly access to all the functionality of the Application.

IDENTIFICATION OF NEED

To identify the need for software we use the Principles of Requirement Engineering. Requirement engineering provides the appropriate mechanism for understanding what the customer wants, analyzing need, assessing feasibility, negotiating a reasonable solution, specifying the solution unambiguously, validating the specification and managing the requirement as they are transformed into an operational system. The requirement engineering process can be described in five distinct steps: -
Requirement elicitation.
Requirement analysis & negotiation.
Requirement specification.
System Modeling.
Requirement validation.
Requirement Management.

In other words we can say that requirement analysis is a software task that bridges the gap between system level requirement engineering and software design. Requirement analysis allows the software engineering to refine the software allocation and build models of the data, functional and behavioral domains that will be treated by software. Requirement analysis provides the software designer with a representation of information, function and behavior that can be translated into data, architectural, interface and component level design; finally the requirement specification provides the developer and the customer with the means to assess quality once software is built.

The most commonly used requirement technique is to conduct a meeting or interview. The first meeting between a software engineer and customer can be likened to the awkwardness of a first date between to adolescents. Neither person knows what to say or ask, Both are worried that what they do say will be misinterpreted, both are thinking about where it might lead (Both likely have radically different expectation here) Both want to get the think over with, but at the same time, both want it to be a success.

Here according to this principle the analyst starts by asking context-free-questions. That is a set of question that will lead to a basic understanding of the problem, the people who want a solution, the nature of solution that is desired, and the effectiveness of the first encounter itself. The first set of Context-free question focuses on the customer, the overall goals, and the benefits. For example, the analyst might ask: -
Who is behind the request for this work?
Who will use the solution?
What will be economic benefit of a successful solution?
Is there another source for the Solution that you need?

The next set of the questions enables the software engineer to gain a better Understanding of the problem and the customer to voice his or her perceptions about a solution: -
How would you characterize "good" output that would be generated by a successful solution?
What problem(s) will this solution address?

Can you show me (or describe) the environment in which the solution will be used?

Will special performance issues or constraints affect the way of the solution is approached?

Are you the right person to answer these questions? Are your answers? Official"?

Preliminary Investigation

The first step in the system development life cycle is the preliminary investigation to determine the feasibility of the System. The purpose of the preliminary investigation is to evaluate project requests. It is neither a design study nor does it includes the collection of details top describe the business system in all respect. Here for the "PedisAlert", I have worked on the preliminary investigation that accomplished the following objectives:

Clarify and understand the project request.

Determine the size of the project.

Assess costs and benefits of alternative approaches.

Determine the technical and operational feasibility of alternative approaches.

Feasibility Study

Not everything imaginable is feasible, not even in software, as it may appear to outsiders. Feasibility is the determination of whether or not a project is worth doing. On the contrary, software feasibility has seven solid dimensions as below: -

1. Technical feasibility.
2. Operational feasibility.
3. Economic feasibility.

The process followed in making this destination is called a feasibility study. This type of study determines when a project can or should be taken. Once it has been determined that the project is feasible, and then analyst can go ahead and prepare the project specification, which finalizes project requirements. Generally, feasibility studies are undertaken within time constraints and normally written in feasibility report. The contents and recommendation of such a study will be used as a sound basis for deciding whether to proceed, postpone or cancel the project.

In other words we can say that a feasibility study is conducted to select the best system that meets performance requirement. This contains identification description, an evaluation of candidate system and the selection of best system for the job.

Project Planning

The planning, design, and installation of a system is termed a project and is directed by a project leader who uses the available resources to produce a new or better system for the organizations.

Thus, project planning for any company has the following four main steps:

1. Organizing the resources available for the project.
2. Scheduling the events of the project.
3. Evaluating the progress.
4. Establishing standards for the project.

Project Scheduling

In project management, a schedule consists of a list of a project's terminal elements with intended start and finish dates. Terminal elements are the lowest element in a schedule, which is not further subdivided. Those items are often estimated in terms of resource requirements, budget and duration, linked by dependencies and scheduled.

The chart techniques are the scheduling tools of the project planner. Even the simplest project should be framed as a chart so that progress can be measured. The Gantt chart is effective for simple projects, especially when the interrelationships among events are not too complex. Complicated scheduling usually requires a PERT chart.

A schedule must be flexible because unexpected events may occur that may affect the schedule for the development of the systems.

If a project leader cannot enforce a schedule, someone else should be leading the project. The following are variety of options that are open to the project leader:

• Increase the budget.
• Increase manpower in the form of overtime or additional people.
• Add equipment.
• Change priorities.
• Replace the individual responsible.

GANTT CHART OF THE ACTIVITY

A Gantt chart is a type of bar chart that illustrates a project schedule. Gantt charts illustrate the start and finish dates of the terminal elements and summary elements of a project.

Development Phase	120 Days						Duration (Day)
	0 to 15 Day	16 to 30 Day	31 to 45 Day	46 to 60 Day	61 to 75 Day	76 to 90 Day	
Requirement Gathering	▭						10
Analysis	▭						15
Design		▭					30
Coding			▭				25
Testing					▭		18
Implementation						▭	08
Documentation	▭						
Total Time (Days)							90

Terminal elements and summary elements comprise the work breakdown structure of the project. Some Gantt charts also show the dependency (i.e., precedence network) relationships between activities.
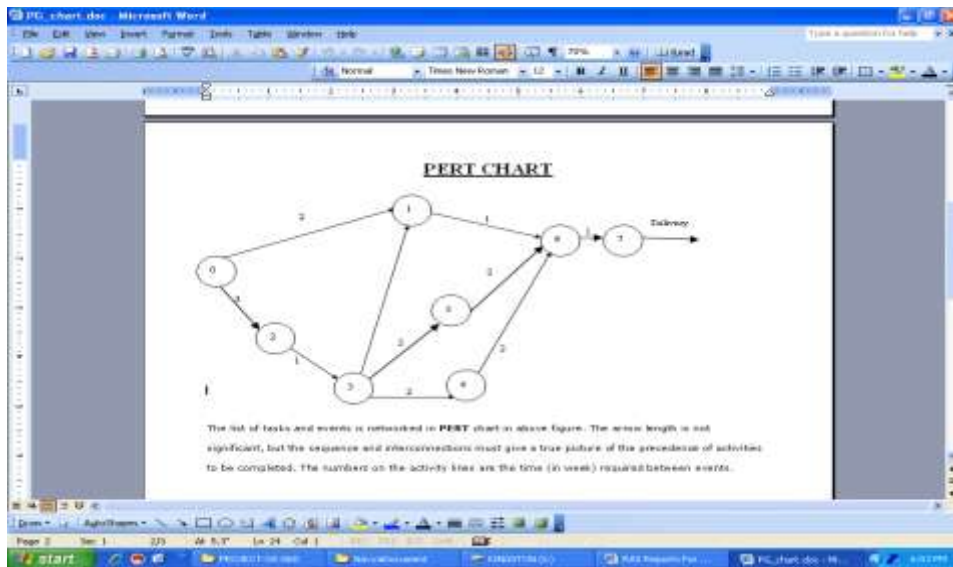
The numbers on the activity lines are the time (in week) required between events.
Duration (in weeks) $2 + 3 + 1 + 2 + 2 + 2 + 2 + 1 + 1 = 16$ weeks

IV.   CONCLUSION

The system successfully concludes that image search results are more relevant when done using keyword Driver safety can be enhanced by monitoring driver behavior, recording their aggressive driving events and giving feedback of recorded events. Monitoring driver behavior using inbuilt sensors of smartphone has been evolving as a new trend because of less cost and considering the fact that many people already own it. This paper surveys various methods of detecting driver behavior. The rash driving detection techniques can be provided along with the sensors and the techniques can be useful. These techniques can even be extended and enhance the security features to the common people.

The usage of vehicles is increasing day by day. Most of the people disobeys the rules of traffic and may do the rash driving. Rash driving may be abrupt change in speed, continuous change in lane etc. Rash driving is most dangerous for people. If there is more number of vehicles moving on a road, then there is more possibility of accident. Now

day's mobile phones are equipped with numerous sensors that can help to aid in safety enhancements for drivers on the road. There is lot of sensors used to detect the rash driving. These sensors are being discussed a in this survey. This paper provides a survey of various methods for analyzing driver behavior.

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