GPS BASED VEHICLE TRACKING AND MONITORING SYSTEM- A SOLUTION FOR PUBLIC TRANPORTATION

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Abstract – A vehicle tracking system is an electronic device designed with the computer software enables the owner or a third party to track the vehicle location. A location defined using GPS technology is almost accurate to obtain the real vehicle location. Vehicle monitoring system can be implemented using GPS technology; therefore it effectively reduces the vehicle management cost. This paper provides a solution for tracking and monitoring the public transportation vehicles. In this method GPS technology is used to obtain the location of the vehicle using the space based navigation system. Raspberry Pi processing board is used which processes the received values and gives the final output. This method explains a way to monitor the public transportation vehicle from the location A to location B. Raspberry Pi processor compares the passenger specified values with the current location values therefore if the result is not the same then passenger is informed about the same.

Key Words: **GPS technology, Raspberry Pi, Monitoring, Tracking.**

1.INTRODUCTION

Tracking systems are widely used to keep an eye on the moving objects. In India public transportation vehicles are the primary mode of transportation. The public transportation vehicles are always vulnerable targets for various crimes. It is required to monitor such antisocial activities. It can be done by using surveillance systems such as global positioning system. GPS system can observe the vehicle activities twenty four- seven. Most of the vehicle tracking applications are developed using GPS technology. GPS technology is widely used to verify the status of a moving object on which GPS receiver is mounted. This paper provides a solution for tracking and monitoring the public transportation vehicles using GPS technology.

2. HARDWARE DESIGN

2.1 Raspberry Pi

The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a smart little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python. It is running on Python programming language.

A considerable number of programming languages have been adapted for the Raspberry Pi, either by the creator of the language or by users of the language who wanted to see their language of choice available on the Raspberry Pi. Python, C, C++, Java, Scratch, and Ruby all come installed by default on the Raspberry Pi.

Fig -1: Raspberry Pi

2.2 GPS Antenna

A GPS antenna is a device that boosts the received signal to a GPS unit, whether it is a standalone unit or an embedded unit. GPS antenna can transmit and receive signals. It can contact the positioning satellites in the sky through the transmitting signals so that the satellites will be able to know the situation of the user. Often a GPS antenna is used in a situation where the GPS unit itself is somehow removed from a line of sight to the sky.

The GPS antenna simply receives the electromagnetic signals from the satellites. To convert the electromagnetic signals to digital values we need a GPS receiver unit. This GPS receiver unit stores the GPS data onto an SD card.

3. SOFTWARE DESIGN

3.1 Raspbian Operating System

Raspbian is a free Operating system for Raspberry Pi board. Raspbian has all the necessary packages to run the Raspberry pi board. The operating system for Raspberry Pi is stored in a well- formatted SD card. This SD card is connected to the SD port of Raspberry Pi in order to load the Operating System when power supply is ON. Raspberry Pi can run on both windows and Linux Operating systems.
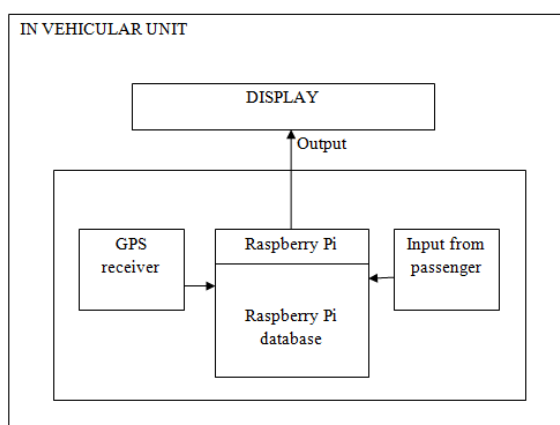
4. SYSTEM ARCHITECTURE

Fig -2: System Design

GPS receiver module captures the longitude and latitude values of the current location continuously. A passenger who boards the vehicle can give different intermediate locations to the system between the source and destination locations. These values are stored inside the Raspberry Pi database. When the vehicle starts system compares the current location values with the stored location values. If the comparison gives less tolerance then we can say that driver is driving in the right direction otherwise warning message is sent to the display system. Therefore, passenger can be informed about wrong directions.

3. CONCLUSIONS

This vehicle tracking system provides a solution for monitoring vehicle. Therefore driver should drive the vehicle in the passenger defined path. This system can be implemented with the GSM system to send alert messages to passengers mobile.

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