

Article

Bus Tracing Scheme using Geofencing

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A B S T R A C T

The bus tracking scheme determination attend as a usable warning system that will efficiently assistance commuters in assembly the choice of whether to wait for the bus or not. This scheme is a Standalone arrangement envisioned to show the real-time position(s) of the buses with the use of GSM module expertise. The system will consist of Geo-fencing. Geo-fencing is a feature in a software program that uses the Global Positioning System (GPS) or Radio Frequency Identification (RFID) to define geographical boundaries. Geofencing allow an administrator to set up triggers so when a device enters (or exits) the boundaries defined by the administrator; an alert is issued

Keywords: GPS/RFID, Geo-fencing, Smoke/ Alcohol Detection Systems, Mobile Applications

Introduction

Vehicle and fleet tracking systems presents a stimulating system and have raised a great interest to many companies and developers. This interest is based on the need for such a system but it is also based on the complexity and the challenge for making such a valuable and essential system.

The main problem is about cost. Having in mind that there are numerous skills combined, then effortlessly can be unstated that the cost can often be very high. The rudimentary impression behind this method was to make a system that serves as a vehicle tracking system and is based on Geo-fencing and GPS Services. This system tends to be more rate actual than preceding one deliberated above. Many geo-fencing applications incorporate Google Earth, allowing administrators to define boundaries on top of a satellite view of a specific geographical area. Other applications define boundaries by longitude and latitude or through user-created and Web-based maps. Interesting thing about this approach is that its usages mobile phones based on Android platform.

Literature Survey

Title and authors

Majd Ghareeb, Athar Ghamlous, Hawraa Hamdan, Ali Bazzi

and Samih Abdul-Nabi, Smart bus: A tracking system for school buses, Computer and Communication Engineering ,International University of Beirut 146404 Mazraa, Beirut, Lebanon, 2017.^[1]

Description

With the intensification awareness of education and knowledge Importance, Lebanese citizens became extra and additional Selective in the excellence of schools they are choosing for their Children. This detail might chief parents to select a good school Even if it is far from their residence. On the other hand, and Even if the school was close enough, the traffic overcrowdings would type the on-feet journey of the kid to the school very risky. Driving children to school is a solution. Though, it munches a lot of period and effort each day in the morning and the afternoon. Hence, school buses are usually used by all schools to take the student from and to his home. However, and again with the huge traffic congestions in Lebanon, waiting the bus each day in the morning and in the afternoon to arrive is an exhausting and a time-wasting mission. To resolve the aforementioned issue, many tracking systems do exist in the market such as the kids GPS watch. It is a wearable mobile GPS where parents can track their kid's position. Each kid will have his own tracker that usually costs more than 100 American

Dollars. Additional solution is to give a mobile phone to the kid, so a tracking application can be used to detect the position. However, holding a mobile phone in schools is usually prevented for the students without declaring the bad side effects of this step.

Title and authors

Halili, Arbnor & Gashi, Kujtim. (2013). Real-Time Vehicle Tracking System Using GPS/GSM/GPRS Technology – Kosovo Government Vehicles Case.²

Description

Vehicle and fleet tracking systems presents a stimulating system and have raised a great interest to many companies and developers. This interest is based on the need for such a system but it is also based on the complexity and the challenge for making such a useful and necessary system. The main problem is about cost. Having in mind that there are many knowledges incorporated, then easily can be understood that the cost can often be very high. The basic idea behind was to make a system that gives the coordinates of the vehicle from its location regarding GPS satellites whenever these data are requested. The re-request was designed to be made using Short Message Services (SMS). This kind of system has somewhat bigger cost and it is not a real time system. Additional method that is very stimulating is made by the basic idea behind this approach was to make a system that serves as a vehicle tracking system and is grounded on GPS and GPRS services. This system tends to be more cost effective than previous one discussed above. Stimulating thing about this technique is that it uses mobile phones based on Android platform. As authors mentioned in their paper, the decision to use smart phones was made since smartphones have GPS receiver and a GPRS transmitter.

Methodology

This section familiarizes us architecture of the system and Modules of the system. It also comprises the input to the module dispensation and obligatory output to the scheme.

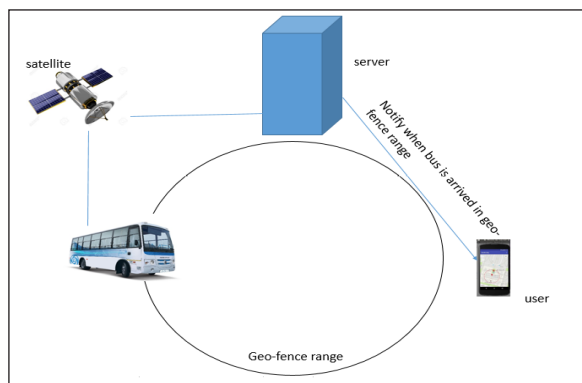


Figure 3.1. System Architecture of BUS tracking system using Geofencing

System Architecture

The system architecture shows the block schematic of the system. It shows the various levels of the system and their individual functionality. The system architecture is an efficient way of on behalf of the working of a system.

Prototype Model

Geo-fence

A geo-fence is a computer-generated boundary for a real-world topographical area. A geo-fence might be energetically produced as in a radius about a point location, or a geo-fence can be a predefined group of limitations (such as school zones or neighbourhood boundaries).

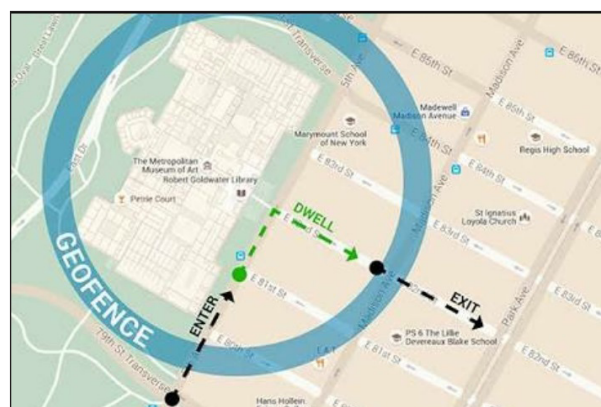


Figure 3.2. Geo-fence

GPS

The GPS (Global Positioning System) prepares not necessitate the user to transmit any data, and it functions self-sufficiently of any internet or telephonic reception, however these skills can intensification the practicality of the GPS positioning info. The GPS delivers many competences like critical positioning competences to military, civil, airplane and profitable users about the world.



Figure 3.3. GPS (Global Positioning System)

NEO-6M GPS module

The NEO-6M GPS module is a well-performing whole GPS receiver with a built-in 25 x 25 x 4mm ceramic antenna, which delivers a strong satellite search competence. With the power and signal pointers, you can monitor the rank of the module. Thanks to the data backup battery-operated, the module can save the data when the main authority is shut down accidentally. Its 3mm growing holes can ensure easy assembly on your aircraft, which thus can fly steadily at a fixed position, return to Home automatically, and automatic waypoint flying, etc. Or you can apply it on your smart robot car for automatic returning or heading to a certain destination, making it a real “smart” bot!

Features

- A complete GPS module with an active antenna combined, and a built-in EEPROM to save conformation parameter data.
- Built-in 25 x 25 x 4mm ceramic active antenna delivers sturdy satellite search competence.
- Fortified with power and signal indicator lights and data backup battery.
- Power supply: 3-5V; Default baud rate: 9600bps.
- Interface: RS232 TTL

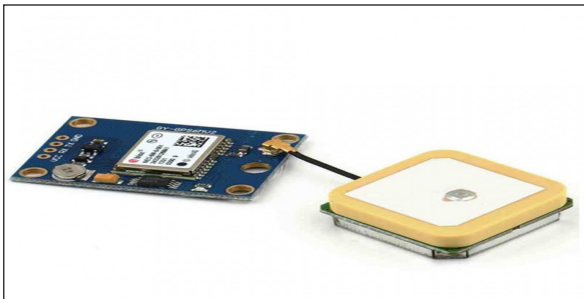


Figure 3.3.NEO-6M GPS module

ESP8266 Controller

The ESP8266 is a low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller competence formed by manufacturer Express if Systems in Shanghai, China.

The chip primary came to the consideration of western makers in August 2014 with the ESP-01 module, made by a third-party producer Ai-Thinker. This minor module lets microcontrollers to connect to a Wi-Fi network and make simple TCP/ IP associates using Hayes-style commands. Though, at first there was nearly no English-language certification on the chip and the commands it acknowledged. The self-same low price and the detail that there were very insufficient outside components on the module, which suggested that it could finally be very cheap in volume, attracted many hackers to determine the module, chip, and the software on it, as well as to translate the Chinese documentation.

The ESP8285 is an ESP8266 with 1 MiB of built-in flash, permitting for single-chip devices accomplished of connecting to Wi-Fi.

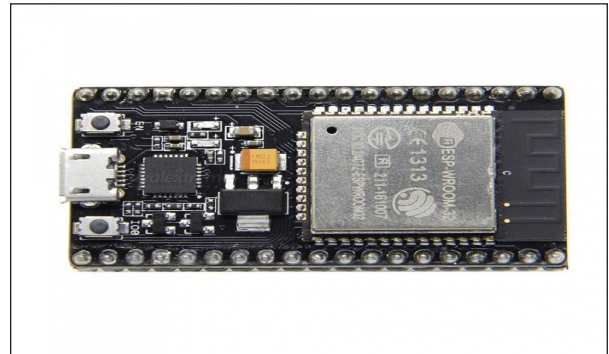


Figure 3.4.ESP8266 Controller

GSM

GSM (Global System for Mobile communication) is a internationally recognized standard for digital cellular communications. GSM that usages a variation of time division multiple access (TDMA) and is the greatest extensively used of the three digital wireless telephony technologies like as TDMA, GSM and code-division multiple access (CDMA). TDMA is text-based services over mobile phone networks through this we send messages. GSM digitizes and poullices data, then sends it down a channel with two additional streams of user data, respectively in its particular time slot.

MQ-2 Gas Sensor

Gas Sensor MQ-2 is a sensor for combustible gas and smoke by perceiving the attentiveness of combustible gas in the air. They are hand-me-down in gas detecting apparatus for smoke and flammable gasses in domestic, industry or automobile.



Figure 3.5.MQ-2 Gas Sensor

Conclusion

While waiting for a bus, people may feel impatient and nervous if he or she does not know when the bus will arrive. For the bus management side, it is very problematic to deliver a precise schedule for bus user due to approximately doubts may happen on the road such as traffic jam or bus

break down. When a bus is delayed, bus management side should inform bus user immediately. However, they do not have a podium to inform bus user in real time about the latest bus traffic status. In order to enhance bus system and increase the performance of bus service provider, the bus tracking system is needed. Bus tracking system provided a real time platform for bus user to check on bus traffic status in anytime and anywhere. It also on condition that a platform for bus service provider to monitor bus status and inform latest information to user also we are using MQ2 Gas sensor that detect the smoke and alcohol.

References

1. Ghareeb M, Ghamlous A, Hamdan H et al. Smart bus: A tracking system for school buses, Computer and Communication Engineering. *International University of Beirut 146404 Mazraa*, Beirut, Lebanon, 2017.
2. Halili, Arbnoor, Gashi et al. Real-Time Vehicle Tracking System Using GPS/GSM/GPRS Technology – Kosovo Government Vehicles Case 2013.
3. Pan YH. Development Trend of Wireless Mobile Communication, *Communication Technologies* 2006; 4(2): 55-57.
4. Ochieng WY, Sauer K. Urban road transport navigation: Performance of the Global Positioning System after selective availability. *Transportation Research Part C*, 2002; 10: 171-187.
5. Nakajima M, Haruyama S. New indoor navigation system for visually impaired people using visible light communication, *EURASIP Journal on Wireless Communications and Networking* 2013: 2013:37
6. Motorola, Inc. Overview of 2G LCS Technologies and Standards. 3GPP TSG SA2 LCS Workshop, London, UK, 11 - 12 January 2001.
7. Willassen SY. A method for implementing Mobile Station Location in GSM.
8. Krishnan AG, Kumar AS, Madhu B et al. GSM Based Real Time Bus Arrival Information System. Amrita School of Engineering, Coimbatore, India, International Conference on Advances in Engineering & Technology – 2014 (ICAET-2014)
9. Niu H. Research and Implementation of Bus Monitoring System Based on GIS. Bachelor dissertation, Beijing Jiaotong University, Beijing, China, 2008.
10. Chandurkar S, Mugade S, Sanjana Sinha et al. Implementation of Real Time Bus Monitoring and Passenger Information System. *IJSRP* 2013; 3(5).
11. El-Rabbany A. Introduction to GPS: the global positioning system. ARTECH House, INC, 2002: 117-127.
12. Thong STS, Han CT, Rahman TA. Intelligent Fleet Management System with Concurrent GPS & GSM Real-Time Positioning Technology 2007.