

An Internet-of-Things Enabled Connected Navigation System for Urban Bus Riders

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ABSTRACT: A public traffic system mainly depends on driver's manual operation, which will inevitably encounter many problems such as punctuality of the bus's arrival on bus station. Paper proposes an supervisory system based on GPS and GSM technology, to improve the operation efficiency of bus monitoring system and realize intelligent transportation system. This project introduces the bus monitoring system from the aspect of both hardware design and software design. System takes it into accounts for the respective advantages of GPS and GSM, and designs a feasible solution successfully, of practically significant.

KEYWORDS: Microcontroller, GSM Modem, Vibration Sensor, Smart Phone.

I. INTRODUCTION

As cities continue to grow in size and population, new challenges arise for the design of urban mobility infrastructures. While public bus transport systems have the capacity to absorb large masses of urban travelers, their public image often suffers from a negative perception. First, from a passenger's point of view, bus networks in dense urban areas are often considered as complex and difficult to navigate. Second, in contrast to private modes of transport, travelling on buses offers only a low level of comfort and convenience. Third, bus journeys lack a sense of personal control and ownership that is valued by car users. To overcome these inherent weaknesses of the physical bus transport system, researchers increasingly turn their attention to digital technologies in order to improve the perceived quality of bus transport. To fill this gap, the Internet-of-Things (IoT) provides great opportunities to improve existing public transport system by embedding smart technology into real world transport usage contexts.

II. RELATED WORK

Research on public transportation has traditionally focused on methods to improve the efficiency of the physical transport system. For instance, service scheduling is considered as an important problem for efficient bus transport operation. However, Camacho et al. argue that this perspective is just motivated by the interests of transport operators and falls short of the information needs of passengers in the digital age. Instead of resolving operational transport issues, they suggest to design passenger –centric information system that have the ability to improve the passengers journeys.

III. EXISTING METHOD

The main use of this project is to display and announce the stopping in the buses. The project has several RF Transmitter sections which could be used for provide the information to bus. During the time of running if the bus crossed across there in the relevant transmitter section, the particular transmitter section indicates the relevant message to driver through RF wireless communication. From this we can display the relevant stopping

VLPROPOSED METHOD

An integrated system is dedicated to the task is a combination of software and hardware. Some of the main tools used in the integrated process are microprocessor and microcontroller.

Typically microprocessors, known as general purpose processors since inputs, the process can accept and output. In contrast, not only as a microcontroller accepts data information, but also multiple data devices, the control interface with data handling and therefore the results.

Microcontroller PIC “image based password authentication for illiterates using touchscreen”. A unique project that has a touchscreen using sensor to control devices in the apartment is used.

BLOCK DIAGRAM

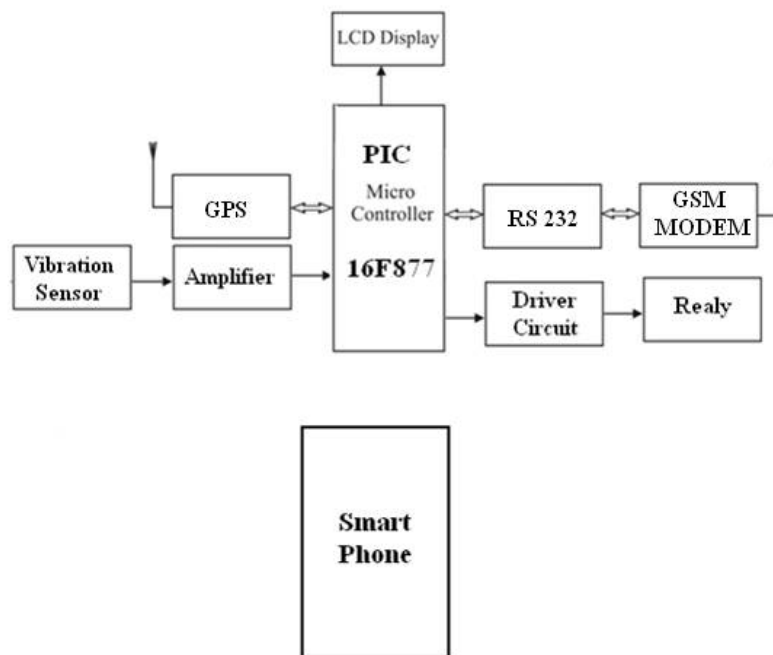


FIG 1: BLOCK DIAGRAM

The main blocks of the project are:

1. Microcontroller(16F877)
2. Vibration Sensor
3. GSM Modem
4. LCD Display
5. Smart Phone

The main use of this project is to display and announce the stopping in the buses. From this we can display the relevant stopping .This project introduce the bus monitoring system from the aspect of both hardware and software design. Paper proposes an supervisory system based on GPS and GSM Technology.

DESIGN RATIONALE

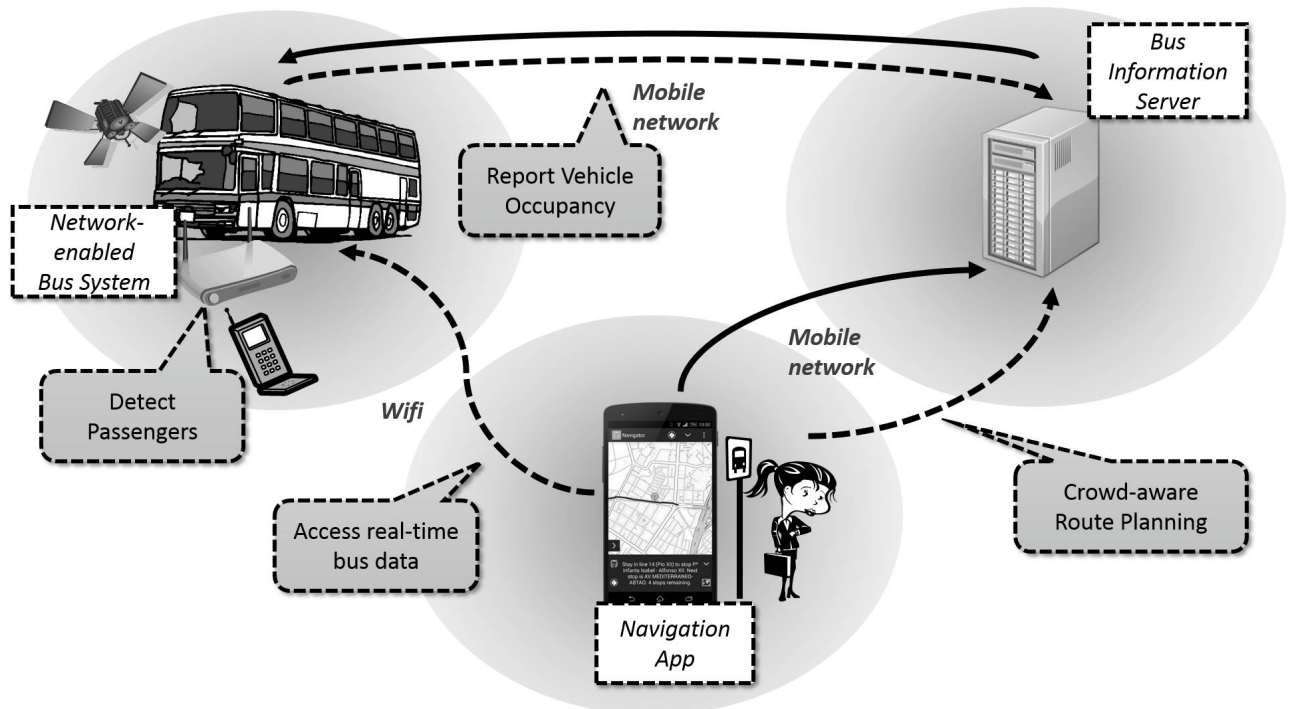


FIG 2: The urban bus navigation system

1. The network enabled urban bus system with Wi-fi equipped buses vehicles, Wi-fi is used to establish local networks for sharing bus data with the passenger's mobile phones.

2. The UBN Navigation App for bus riders. The UBN APP is a smartphone application that is able to track a user's bus journey.

3. The bus crowd information server to collect real time occupancy information from buses operating on different routes in Madrid.

V. ADVANTAGES AND DISADVANTAGES

ADVANTAGES

1. Low power consumption.
2. Quick response.
3. Easy to use and easy to install.

DISADVANTAGES

1. Interfacing microcontroller with sensor is highly sensitive.

VI. CONCLUSION

In this paper, we have presented the Urban Bus Navigator, a navigation system for bus passengers that has the ability to seamlessly interconnect bus passenger with the real world public bus infrastructure. The UBN relies on a distributor iot system comprising an embedded bus computing system, backend computing infrastructure and a mobile smart phone app to detect the presence of passenger on buses and provide continuous real time navigation over the complete course of a bus journey.

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