Bommaraju et al. 2017. *Int. J. Vehicle Structures & Systems*, 9(2), 110-112
ISSN: 0975-3060 (Print), 0975-3540 (Online)
doi: 10.4273/ijvss.9.2.09

International Journal of Vehicle Structures & Systems
Available online at www.maftree.org/eja

Aided System for Visually Impaired People in Bus Transport using Intel Galileo Gen-2: Technical Note

K. Bommaraju[a], A. Manikandan[b] and S. Ramalingam[c]

Dept. of Electronics and Communication Engg., Government College of Engg., Trichy, India
[a]Corresponding Author, Email: bommaraju@gces.edu.in
[b]Email: mani85a@gmail.com
[c]Email: ramvlsi104@gmail.com

ABSTRACT:

Outwardly impeded individuals experience issues in travel and getting to data about open transportation frameworks. A few frameworks have been created for encouraging outwardly hindered utilizing the city transport. Most frameworks give double way correspondence and require expensive and complex hardware. The objective of this work is to decrease the troubles confronted by outwardly debilitated individuals while boarding in city transports, utilizing an intuitive remote correspondence framework. The framework contained a client module and a transport module to give an immediate coordinated association to diminish the existing challenges with a new many-to-numerous correspondence. When the client triggers the switch, the client module promptly conveys the data. In the event that the transport module gets the coordinated flag, it hums and shows the notice in the display to advise the transport driver that somebody is holding up to blind people on the transport. The intelligent remote correspondence help framework is a legitimate and minimal effort gadget for helping outwardly weakened individuals to utilize the city transports.

KEYWORDS:

Wireless communication; Visual impairment; Public transportation; Intel Galileo

CITATION:

K. Bommaraju, A. Manikandan and S. Ramalingam. 2017. Aided System for Visually Impaired People in Bus Transport using Intel Galileo Gen-2: Technical Note, *Int. J. Vehicle Structures & Systems*, 9(2), 110-112. doi:10.4273/ijvss.9.2.09.

1. Introduction

The utilization of open transport is indispensable to the efficiency and freedom of outwardly hindered individuals. Supporting outwardly debilitated individuals to utilize open transport can expand their odds of training and business and decrease the financial burden on their families. The key issues faced by them are accessing the data about bus stop, route maps, transport arrival times and passenger details, which keep them away from utilizing bus transport often. Some position route frameworks have been produced to take care of the issue of finding transport stops. Propelled open transportation administrations [1], including transport dynamic data strategy with the Global Positioning System (GPS) innovation, have been produced by numerous nations. It assists with the transport stop voice detailing frameworks to give more data to outwardly impeded individuals about the landing of the transport which they need to board.

Some Advanced Public Transportation Services (APTS) joining extraordinarily taking care of gadgets were intended to give dynamic data to outwardly disabled individuals [2]. The APTS named "e-transport framework" began to be seen in Taipei city since 2005[3]. However, this system was not benefit for utilizing many-to-numerous correspondences. Different frameworks [4-6] have been produced for outwardly impeded to speak with transport drivers. Many of these frameworks offered just a single way correspondence. Outwardly debilitated individuals are frequently overlooked at transport stops if nobody educates transport drivers about waiting passengers. The point of the present review is to lessen the troubles confronted by outwardly disabled individuals while bringing transports with intuitive remote correspondence plan. The intelligent input framework permit outwardly impeded individuals and transport drivers to get the transmitted signs from each other and enhance the achievement of passenger catch the right buses[4].

The objective of this is to help the visually impaired people to transport easily and also we added some extra features through which the deaf could also be benefited in bus transport. The modules for the user and bus were developed. The user module will be handled by the user or it can also be placed as common in the bus stop, so that all the people can use it and then if it is handled by single user alone then he or she can only uses it. The bus module is fixed near the driver's visibility.

2. Development of hardware and systems

Both the bus driver and passenger(user) modules have a transmitter and a receiver. The passenger waiting at the bus stop should switch on the passenger module, it sends out the signal, that signal is received at the receiver of the bus module. Then automatically the alarm sound will

be produced and then the LCD will display that a passenger is waiting at the nearby bus stop. Then an LED will be glowing next to the driver. Coding and De-coding ICs are used for this process. The block diagram along with the components connection of both user and bus module of the developed system frame work is shown in Fig. 1. In the developed system, one-to-one interactive wireless communication system is used. The collision of communication data over the one-to-one interactive wireless communication leads to the poor stability and low accuracy of wireless communication. Hence, the signal is transmitted through two distinct frequency bands: 434MHz and 315MHz.

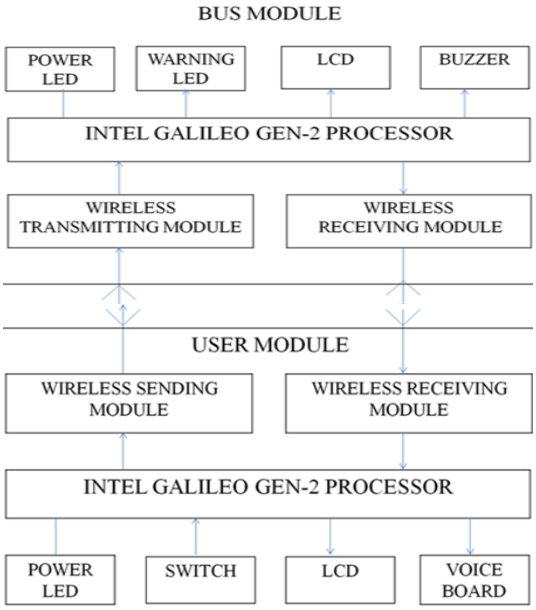

Fig. 1: System framework for the user & bus modules

The signal is transmitted and received using RF transmitting and receiving modules. Different types of LCD, such as warning LED to glow while the buzzer buzzes and the power LED to indicate the status of the module whether it is in ON or OFF state, are used. Intel Galileo Gen-2 board (see Fig. 2) is used in Adruinio programming platform. This board can also be used as a PC after installing an OS through SD card. It can be connected to LAN to access internet. It has 20 digital pins which can be used as input/output and 6PWM output pins. It works with a power supply of 7-15V DC input. An 18 pin HT12E coding IC is used to convert the parallel input to serial output. It has an active low enable pin and works on the voltage level of 2.4-12V. An 18 pin decoding IC is used to convert the serial input to parallel output and operates at the he voltage level of 2.4-12V.

Fig. 2: Intel Galileo Gen-2

3. Results and discussions

A basic requirement of the developed system is the wireless communication distance. If the wireless communication distance is shorter than bus may have lesser stopping distance. Conversely, if the wireless communication distance is too long, it is possible that the bus driver would have received the information from a waiting user too early. To avoid such situations, the maximum transmission distance of this system is kept as lesser than 100 m. Both the user and bus modules contain wireless transmission and receiving systems. When the user module sends out a signal, it is transmitted through 434 MHz band to the bus module, which then sends reply through 315 MHz band to the user module. In this way by using different frequencies for transmitting and receiving signals, the problem of wireless data collision between users is avoided. The outputs are displayed in an LCD displace. The snapshots from the transmitter and receiver are shown in Fig. 3 and Fig. 4 respectively. This has demonstrated the functioning of developed system to aid the transportation of visually impaired people.

Fig. 3(a): Transmitter -Initial stage

Fig. 3(b): Transmitter - After request

Fig. 3(c): Transmitter - After key pad press

Fig. 4(a): Receiver - Request of the blind person in the bus module

Fig. 4(b): Receiver- Indication of the blind person

4. Conclusion

In this paper, a wireless communication system using Intel Galileo board, coding & de-coding ICs and LCD display panes was designed and system programming was undertaken. The wireless communication system can transmit and receive the signals at 434 MHz and 315 MHz respectively within 100m from the bus stop. The demonstrated system improves the confidence of the visually impaired people to take city buses and travel to their desired destination on their own without hassle. This system is flexible to any climatic conditions.

REFERENCES:

[1] A. Montarzino, B. Robertson, P. Aspinall, A. Ambrecht, C. Findlay, J. Hine and B. Dhillon. 2007. The impact of mobility and public transport on the independence of visually impaired people, *Vis. Impair. Res.*, 9, 67-82. https://doi.org/10.1080/13882350701673266.

[2] E. Neuville, M. Izaute and L. Trassoudaine. 2009. A way finding pilot study: The use of the intelligent public vehicle by people with visual impairment, *Br. J. Vis. Impair.*, 27, 65-74. https://doi.org/10.1177/0264619608097747.

[3] *Survey on Difficulties in Daily Living of above 6 Year-Old Physically and Mentally Disabled*, Report on Physically and Mentally Disabled Citizens Living Demand Survey, 2000, Taiwan Ministry of the Interior, Taipei, Taiwan.

[4] W.R. Wiener, P. Ponchillia, E. Joffee, J.R. Kuskin and J. Brown. 2000. The effectiveness of external bus speaker systems for persons who are visually impaired, *J. Vis. Impair. Blind.*, 94, 421-433.

[5] T.P. Hatlen and L.A. Myers. 1990. Advocating in behalf of blind and visually impaired bus travellers, *Access to Mass Transit for Blind and Visually Impaired Travellers American Foundation for the Blind*, 87-91.

[6] H.L. Wang, Y.P. Chen, C.L. Rau and C.H. Yu. 2014. An interactive wireless communication system for visually impaired people using city bus transport, *Int. J. Environ. Res. Public Health*, 11(5), 4560-4571. https://dx.doi.org/10.3390/ijerph110504560.