Android Based Smart Signboard Application

Ashwini M; Navaneetha H P & POOJA C
Computer science and engineering(MTECH) MIT, MUYSURU, INDIA

ABSTRACT
India has extensive road and highway systems having traffic signs or road signs that are installed beside roads to provide driving instructions to drivers. Such as, Speed limits, Speed breakers, bridges, narrow roads, and other information of interest to drivers. Unfortunately, observing the applicable speed limit can be burdensome on a driver. For example, speed limit signs, accident zone, speed brake signs, etc. can be missed if the driver's attention wavers or if a large vehicle obstructs the driver's view from the sign. This project aims at providing voice alerts to the driver in advance about the road signs using Android application. The project is developed using RF Transmitters, Receivers and an Android application. Transmitters installed in sign board will transfer information to a receiver in the vehicle. Android application converts received signal into a voice based alert. The sign board includes an RF transmitter configured to transmit information to a vehicle-mounted receiver. The driver, passing signboard embedded with RF transmitter will receive information about the sign board.

Keywords: Android; Signboard; RF

INTRODUCTION
A Traffic Sign means any object, device, line or mark on the road whose object is to convey to road users, or any specified class of road user, restrictions, prohibitions, warnings or information, of any description. The term Traffic Sign includes not only signs on posts, but also road markings, delineators, road studs, traffic light signals and other traffic control devices. Subsector Engineering and Planning, of the Interim Road Safety Strategy included in the Inception Report of the Road Safety Component of the Road Maintenance Project, June 1994, called for a review existing design standards and make recommendations for improvement. The Interim Road Safety Strategy also called for the Department of Roads to “produce and print a manual on road signs and markings.

Road fatalities are a major concern in the developed world. Recent studies show that a third of the number of fatal or serious accidents are associated with excessive or inappropriate speed, as well as changes in the roadway (like the presence of road-work or unexpected obstacles). Reduction of the number of accidents and mitigation of their consequences are a big concern for traffic authorities. One important line of action consists in the use of advanced driver assistance systems (ADAS), which are acoustic, haptic or visual signals produced by the vehicle itself to communicate to the driver the signboard information. These systems are somewhat available in commercial vehicles today, and future trends indicate that higher safety will be achieved by automatic driving controls.

Signs are any kind of visual graphics created to display information to a particular audience. This is typically manifested in the form of way finding information in places such as streets. The main purpose of a signs is to communicate, to convey information such that its receiver can make cognitive decisions based on the information provided. The signs can be:

1. Information: signs giving information about services and facilities, e.g., maps, directories, instructions for use, etc.
2. Direction: signs leading to services, facilities, functional spaces and key areas, e.g., sign posts, directional arrows, etc.
3. Safety and Regulatory: signs giving warning or safety instructions, e.g., warning signs, traffic signs, exit signs, rules & regulations, etc.

Drivers have to see these sign boards visually, so that the concentration from the road is distracted every time when ever sign boards have to be seen. Signboards are permanently installed near the roads which are visible to drivers on the roadway. Unfortunately, observing the signboards can be burdensome on a driver. For example, speed limit signs,
accident zone, speed brake signs, etc, can be missed if
the drivers’ attention wavers or if a large vehicle
obstructs the drivers’ view from the sign.

The incorrect or unnecessary use of a sign
annoys drivers, and when this happens frequently,
drivers lose respect for the sign, and it becomes
ineffective in situations where it is really needed. For
the same reason, avoid using signs which impose a
restriction which will be very unpopular and difficult to
enforce. Drivers will stop taking signs seriously when
they see others ignoring them without being caught.

Disadvantages of Existing System:
At night it becomes much more difficult to see and
understand the road and junctions ahead. The survey of
visibility distances should be done when trees and
hedges are in full foliage. At the same time growth
which obstructs visibility should be properly trimmed
and lopped.

Signs must give road users their message clearly
and at the correct time. The message must be
unambiguous and speedily understood. Using standard
signs assists in their quick recognition, as does
uniformity of shape, color and lettering for each type.
1. They are not visible
2. They are not legible
3. They are not understandable.

The solution is to notify and warn the drivers about
the information of the signboards in advance, so that
they are aware of the signs ahead. This is done by
giving voice alerts in advance using android application
and RF communication.

PROBLEM STATEMENT
Road safety improvement requires progress toward
reducing the crash experience of drivers and other
vulnerable road users. The best-practice road safety
strategies focus on improving the quality of life of
people by reducing the frequency of road accidents and
minimizing their consequences.

THE SOLUTION
The solution is to notify and warn the drivers about
the information of the signboards in advance, so that they
are aware of the signs ahead. This is done by giving
voice alerts in advance using android application and
RF communication.

WORKING
The figure 1 shows the system architecture. This
application involves two actors, administrator and the
users. Each actor has separate android mobile
applications. The administrator pairs his application
with RF transmitter and then sets the information of the
signboard to the RF trans-receiver that is embedded in
the signboard. The user in order to receive the
information of the signboard he/she has to pair his/her
mobile with the RF receiver that is embedded in the
car and then start the service of his application. Once
the application is started the user automatically receives
the information from the receiver and the information is
speak out.
The figure 2 shows the context flow diagram of administrator module. The admin has to login to his application in order to write the data, this is done for authentication purpose. He has to enter password, if he enters false password then an alert message is displayed requesting to enter correct password. Once the admin has logged into his application he can write data to RF trans-receiver. Before setting data the Bluetooth must be enabled and the mobile must be paired with RF-transmitter in order to send data to RF trans-receiver. Once all these conditions are satisfied the admin is able to write data and set data to RF trans-receiver.

![Diagram](image)

**Figure 3 Data Flow of User Module**

Figure 3 shows the user module. In order to receive the voice alerts of the signboard information, user has to start the service of his application installed in user mobile. Before starting the service user has to set the preference, that is, the set the kind the information he wants. Then the user has enable the Bluetooth if not enabled error message requesting to enable Bluetooth is displayed. Now it has to be paired with RF receiver so that the received information, if not paired error message of not pairing the device is displayed. Once these conditions are satisfied the service is started and the user can receive the voice alerts.

**CONCLUSION**

Application software designed for the receiving the information of signboard, firstly the information has to be stored in the RF transmitter that is embedded in the signboard. Secondly, the user has to pair his device with the RF receiver and finally when he starts his application in his device he is able to receive the information and get the voice alerts of the signboard information. The system can interprets various traffic signs fixed on the road side and therefore signs which may be obscured by other vehicles or trees may be recognized. This project is very easy to implement on current system, low cost and durable, ensures safety to passengers and public, the driver gets all information about the road without distracting him from driving, driver gets all information even in bad weather conditions.

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