

## ENHANCE SAFETY SECURITY AND TRACKING SYSTEM FOR SCHOOL BUS AND CHILDREN

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### ABSTRACT

Organic light-emitting diodes (OLEDs) operate on the principle of converting electrical energy into light phenomenon known as electroluminescence. they consist of emissive electroluminescent layer comprised of a film of organic compounds (carbon, hydrogen and oxygen). In its simplest form, an OLED consists of a layer of luminescent material sandwiched between two electrodes. When an electric current is passed between the electrodes, through the organic layer, light is emitted with a color that depends on the particular material used. When OLEDs are used as pixels in flat panel displays they have some advantages over backlit active-matrix LCD displays – greater viewing angle, lighter weight, and quicker response. Since only the part of the display that is actually lit up consumes power, the most efficient OLEDs available today use less power. Based on these advantages, OLEDs have been proposed for a wide range of display applications including magnified micro displays, wearable, head-mounted computers, digital cameras, personal digital assistants, smart pagers, virtual reality games, and mobile phones as well as medical, automotive, and other industrial applications.

**KEYWORDS:RFID Based Secured Smart School Bus Arduino, GPS, GSM and contact less Temperature sensor**

### 1. INTRODUCTION

Since its inception in 1853, Indian Railways have progressed a long way. Presently, India has the third largest railway network in the world, covering a total length of around 65,000 Kilometers. [1] With the passage of time, Railways have become a commonly used medium for long distance transport in India.

More and more passengers are using Railways as a means of travel. Millions of tones of goods are now being transported by trains. Indian Railways transport 7651 billion passengers and over 921 million tones of goods annually.

As the world is getting technologically advanced, more complications have set in regarding safety and security of passengers. The report of the High Level Safety Review Committee of 2012 estimates that almost 15,000 number of persons gets killed every year in train accidents. Apart from this, security in trains is also a major concern. Considering all these necessities, the need of the hour is to develop an effective and a technologically advanced communication system in the Indian Railways.



**Figure 1: Basic Mobile Telephone Service Network**

- [1] The Mobile Train Radio Communication (MTRC) system.
- [2] Seems to be the right answer to these concerns. MTRC uses the “Global System for Mobile Communications-Railway (GSM-R)” technology.
- [3] To facilitate an instant and constant interaction with the train crew with the Control Centre and Station Master.



It ensures safety of passengers by providing effective communication between Driver and Control Room. The MTRC system can be used to warn the drivers beforehand of the running trains as well as the concerned officials. In case of any security problem, concerned staff can immediately intimate the concerned security establishment. If any accident takes place, the MTRC system will facilitate better post-disaster management. In the present day, Railways need not just effective voice transmission, but also have the capability to analyze all the technical data to arrive at the correct decision to be taken on the spot.

In India, as per Action Plan of Vision 2020 and safety concerns highlighted by the High Level Safety Review Committee report, a beginning has been made to put MTRC into use in the railways. The MTRC project is being implemented by the Indian Railways Project Management Unit (IRPMU), and it is expected that this technology will help to improve the Railway communication in India manifold and make Railways a safer and better mode of transport for the common man.

## **2. LITERATURE REVIEW**

### **SMART SCHOOL BUS MONITORING SYSTEM USING IOT**

The project idea is to put an end to incidents like Innocent children are ending their lives for unworthy reasons . There are many systems which provide security to the school children. The use of RFIDs makes it easier to maintain and use, but could not give the certain information about the ituation in the bus i.e. this system does not provide any information when children are in dangerous situations . To track the live location of the bus for the speedy recovery when it is subjected to accidents .To intimate the school

management and parents about the hazardous situation in the bus . To avoid the rash driving and to intimate when the bus is subjected to tilt this paper devised a method to identify the students are dropped at correct locations and if they are dropped elsewhere the location is identified and alert is sent to parent. . The system monitors the children inside the bus in a safer manner. It uses the combination of RFID (Radio Frequency Identification), GPS (Global Position System) technologies. Each Student carries a unique RFID card embedded in each of the student's school bags. When the student enters or exits from the bus the reader records and transfer data in the database. Radio Frequency identification (RFID) is used to transmit Information of a subject using radio waves This information consists of unique digital number which differentiates various objects. An RFID system is made up of two different parts viz. RFID tag and RFID reader. There is a microchip antenna inside tag; This chip consists of useful data in different forms. A study has showed that, the performance of reader decreases rapidly with increase in a distance.

### **"ENHANCE SAFETY SECURITY AND TRACKING SYSTEM FOR SCHOOL BUS AND CHILDREN"**

May 2016 A system monitors the daily transportation service for school going children to enhance the security and safety of the children. The system consists of three main units, bus unit, parent unit and school unit. The bus unit consist of hardware parts. The bus unit is used to detect when a child enters/exits from the bus using RFID Card. This information is communicated to the parent unit and school unit that identifies the children did/did not enter/exit the bus. The notification like the students whose next stop is, sent to the parent who stays on the next stop using Geofence. The system enhances the security of the children like the bus hijacked, extracting the location and instantly sending notification to the

admin as well as the nearest police station using SOS and Spherical Cosine Rule.

"SCHOOL BUS TRACKING AND SECURITY SYSTEM" 2018 The proposed system recommends a SMS based application which consists parents to track their children location in real time. Initially the details of the students are collected and stored in the database. The details are converted into QR code and embedded with children's identity card. When the children enters the bus, the QR code is scanned by the mobile application and the timing, stop details will be sent to the parents as notification. Later on, easily track the bus location. Thus our proposed system is capable of notifying parents through SMS once the child enters/leaves the school, enabling parents to trace the bus, helping smooth and safer rides to the school. Paper

"IoT based School Bus Tracking System" Jan 2019 This System recommends an android based solution which assists parents to track their children's location in real time. To track the location Active RFID module is used and to identify the identity of the child a biometric identification is used which is in built in the system. Whenever a child boards a bus, the biometric identification is done in the bus, and the system will identify the child and update log on a server will send notification to the parents which consist of current location and time. Parents can see the location of bus, they will be notified when the children is getting into a bus or getting down from the bus. From above survey we analysed that most of the This allows parents and management to check the status of secure smart school bus by using GSM. The proposed system will provide various facilities like speed control, check drunk and drive, missing children's, accident emergencies, inappropriate drop, panic button, logistic management etc. which are helpful for child security.

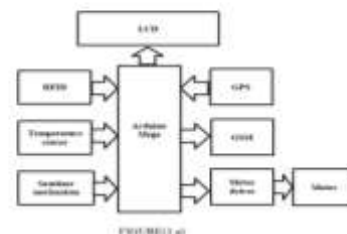
RFID provides authentication of child which will

help to provide security for school going children's. This allows parents and management to check the status of secure smart school bus

## 2. BLOCK DIAGRAM

The system proposed will provide remote control, automatic control, ups friendly control, energy saving etc. Utilizing raspberry pi single board computer as a central hub equipped with a wireless transceiver and touch screen type human machine interface for local operation of the system. The central hub can be connected to a Wi-Fi networks which will further connect the central hub to the internet for controlling and configuring the system remotely via smart phone, tablet, laptop or desktop computer with html5 compatible browser and internet connectivity.

3.1 Block Diagram of vehicle Unit



3.2 Destination unit



Fig.1: Maim block diagram

Arduino Uno is a micro controller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the micro controller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter.

"Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards.

### 3. HARDWARE DESIGN

#### 3 GPS and GSM Modules

A GSM modem can be a dedicated modem device with a serial, USB or it can be mobile phone that provides GSM modem capabilities. The term GSM modem is used as a generic term to refer to any modem that supports one or more of the protocols in the GSM evolutionary family, including the 2.5G technologies GPRS and EDGE, as well as the 3G technologies WCDMA, UMTS, HSDPA and HSUPA. GSM modems can be a quick and efficient way to get started with SMS, because a special subscription to an SMS service provider is not required. In most parts of the world, GSM modems are a cost effective solution for receiving SMS messages, because the sender is paying for the message delivery. It should also be noted that not all phones support the modem interface for sending and receiving SMS messages.



Fig:GSM module

The Smart Modem can be controlled and customized to various levels by using the standard AT commands. The modem is fully type-approved, it can speed up the operational time with full range of Voice, Data, Fax and Short Messages (Point to Point and Cell Broadcast) the logical level of the modem is not compatible with logical states of controller so need have logical conversion from modem to UART port of controller through MAX 232interface



Fig:GPS Module

### 4. SYSTEM SOFTWARE

The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards.

The source code for the IDE is released under the GNU General Public License, version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides

many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main into an executable cyclic executive program with the GNU tool chain, also included with the IDE distribution

## 5. SOFTWARE IMPLEMENTATION



Fig 10.1: Arduino IDE

## FUTURE SCOPE

In the future, we intend to add 'live video streaming' capability to our system so that the parents, as well as the concerned authorities, can view the video showing the condition inside the vehicle in real-time. We also plan to improve the sensitivity and quality of our pressure pad devices. As we mostly used home-quality materials in constructing the pressure pad devices, they tend to malfunction after being used for a long time. We plan to address this issue by trying out different materials with higher longevity while keeping the material cost as low as possible. In addition to ideas above, we intend to develop a web-based interface where registered parents or authorized personnel can log into the system from anywhere in the world using a web browser and internet connection and view sensor and other data of a

vehicle in real-time.

## CONCLUSION

1. The objective of this proposed system is to develop an application which will help to provide security for school going children's.
2. This allows parents and management to check the status of secure smart school bus by using GSM.
3. The proposed system will provide various facilities like speed control, check drunk and drive, missing children's, accident emergencies, inappropriate drop, panic button, logistic management etc. which are helpful for child security.
4. At its most essential, the Internet of Things is a mark for a future in which standard, ordinary things – from family unit machines to autos to mobile devices – are equipped with sensors and associated with the Internet to share their information. Seen all the more extensively, the IoT will offer ascent to a whole environment for interconnected devices, articles, frameworks, and information all cooperating. In this new world, most correspondences will be machine-to-machine (M2M), and there will be a nonstop trade of data between gadgets, sensors, PCs and systems.

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