

Smart Railway Track Pedestrian Crossing without using Staircase

Madhuri R. Gharpinde, Kavita S. Pachare, Sana N. Shaikh, Sneha B. Khadse, Wasiq Raza

Department of E&TC, Shri Shankarprasad Agnihotri College of Engineering, Wardha, Maharashtra, India

ABSTRACT

In the Indian railway framework physically challenged individuals and senior nationals are use trams and flyovers to cross the railway Platforms, so they feel troublesome. To defeat this issue, a programmed mobile platform is proposed in this paper. The versatile Platform is joined in the middle of the railway tracks in the side of the intersection Platform. At the point when there is no train landing in the station, the versatile Platform will be opened and consequently moving like lift. The physically challenged people will utilize the moving Platform to pass the intersection Platforms. At the point when the train is arriving, moving Platforms will be shut. The train entry sign will be declared in a voice framework and demonstrated by LED signal.

Keywords : VANET, Inter Aided Routing, AODV, DSR

I. INTRODUCTION

Presently the Indian railway searches for a change for Indian railway. A definitive point of this framework is to enhance the Indian railway Platforms to help the physically challenged people to cross the intersection Platforms. The exchanging of physically challenged people starting with one Platform then onto the next Platform is troublesome by utilizing fly over. In this framework portable plates are connected in the middle of the railway tracks in the side of the Platforms. At the point when there is no train landing in the station the portable Platforms will be opened and consequently moving like lift. The physically challenged people will utilize the moving Platform to pass the Platforms. At the point when the train is arriving, moving Platforms will be shut. The train entry sign will be declared in a voice framework and demonstrated by LED signal. The fundamental disadvantage of Indian railway is moving up on the fly overs for a physically challenged people are troublesome. The proposed framework gives a superior answer for exchanging physically challenged people in one Platform to another Platform without utilizing fly overs. The mobile plates between two Platforms associate the

Platforms and the lift consequently moves.

II. Current System

The existing system is partially automatic and there is no train arrival indication. There is no voice announcement in the system. The sensors are placed at the tracks which are in side. When the train reaches first sensor, the platform closed and when the second sensor senses the train departure mobile platform is opened. The mobile platform did not move like an escalator. Due to this system the physically challenged people feel difficult.

III. Proposed System

The framework has remote association from transmission unit to getting unit. The Mobile Platforms moves like a lift which is more point of preference than existing framework. At the point when the sensors sense the train entry the voice declaration caution the people to leave and don't utilize the portable Platform. The LED signal sign is utilized to show the train arriving and departure in the railway station. The remote connection from transmitter to beneficiary lessens the establishment

hardware of the framework. The remote transmission gives the transmission velocity of the IR sensor to controller unit. In the controller unit the voice declaration, LED sign and engine units are controlled. In the mobile platform unit, it moves to associate the intersection Platforms and begin to move the lift. The physically challenged people will utilize the Mobile Platform to cross the intersection Platforms. At first the sensors sense the train landing and the recipient will get the sign status of the train.

IV. SOME IMPORTANT COMPONENTS USED FOR MOBILE PLATFORM

HARDWARE USED

- A. ATmega8
- B. IR Sensors
- C. Wireless Module
- D. DC Motors
- E. Escalator
- F. Voice Module
- G. Light Emitting Diodes
- H. L293D Motor control

A. ATmega8

The ATmega8 is a low-power CMOS 8-bit microcontroller in light of the AVR RISC engineering. By executing capable directions in a solitary clock cycle, the ATmega8 accomplishes throughputs drawing closer 1 MIPS for every MHz, permitting the framework originator to upgrade power utilization versus handling speed. The ATmega8 gives the accompanying components: 8K bytes of In-System Programmable Flash with Read-While-Write capacities, 512 bytes of EEPROM, 1K byte of SRAM, 23 universally useful I/O lines, 32 broadly useful working registers, three adaptable Timer/Counters with look at modes, interior and outer intrudes on, a serial programmable USART, a byte situated Two wire Serial Interface, a 6-channel ADC with 10-bit precision, a programmable Watchdog Timer with Internal Oscillator, a SPI serial port, and five programming selectable force sparing modes.

B. IR sensors

Four sets of IR sensors are utilized to sense the train landing and departure previously, then after the fact 5 km separation from the railway intersection. At the point when the main pair of IR sensors 1 and 2 senses the train landing it educate the microcontroller Platform close. At that point second match of IR sensors 3 and 4 are sense the train teach to Mobile Platform to open for use. In IR structure the infrared transmitter and recipient are intended to sense the nearness or non attendance of allotments such that lighting capacities change to suit the proper size space.

C. Remote Module

The remote module associates the transmitter and beneficiary unit association through USART serial port correspondence by CC2500 remote module. In transmitting unit CC2500 transmitter associated with the ATmega8 board through RS232 serial correspondence link. At the recipient end another ATmega8 with remote beneficiary unit is associated. The CC2500 is a minimal effort 2.4 GHz handset intended for low-control remote applications. The circuit is proposed for the 2400-2483.5 MHz ISM (Industrial, Scientific and Medical) and SRD (Short Range Device) recurrence band. High sensitivity (–104 dam) at 2.4 k Baud, 1% bundle mistake rate) It has the accompanying components Low current utilization (13.3 mA in RX, 250 k Baud, include well above sensitivity limit), Programmable yield power up to +1 dBm, Excellent recipient selectivity and blocking Execution, Programmable information rate from 1.2 to 500 kBaud, Frequency range: 2400 – 2483.5 MHz

D. DC Motors

DC motor performs the fundamental operation of the mobile framework. When it gets the sensor guideline the motor turn in clockwise bearing to mobile platform close. At the point when the sensor gets the second combine of IR sensors guideline DC motor pivots in anticlockwise bearing to Mobile Platform to open. The gear motors are controlled by L293D microcontrollers inserted with ATmega8 microcontroller in the beneficiary unit of the

framework. Here 3.5 rpm 12V DC equipped motors are used. 12V DC motors with gearbox, 6 mm shaft breadth with inward gap. No-heap current=60 mama (max), load current=300 are used.

E. Lift

Lift setup works with the DC motor controls. Lift turns when the portable Platform moves between two intersection Platforms. At whatever point the Mobile Platform open, the elevator moves for physically challenged people cross the Platforms. The lift controlled by rigging motor by turning clockwise course of engine. The elevator is worked by one of rigging engine in the recipient unit of the Mobile Platform. The motor pivots when the Mobile Platform closed. Moving walkways are inherent the accompanying essential style. Moving belt sort is for the most part worked with cross section metal belts or elastic strolling surfaces over metal rollers. The strolling surface may have a strong vibe or a "bouncy" vibe. The moving walkway has a scored surface to work with comb plates at the finishes. Likewise, almost moving walkways are worked with moving handrails like those on elevators.

F. Voice Module

Voice module declares the train entry and departure for the Mobile Platform clients and uneducated individuals. The voice module utilized as a part of this framework is APR9600. It gives the accompanying components. The APR9600 gadget offers genuine single-chip voice recording, non-unpredictable capacity, and playback ability for 40 to 60 seconds. It requires low power utilization of working current: 25 mA run of the mill standby current: 1 uA. The IC can work in one of two modes: serial mode and parallel mode. In serial access mode, sound can be recorded in 256 segments. In parallel access mode, sound can be recorded in 2, 4 or 8 areas. The IC can be controlled basically utilizing push catch keys. It is likewise conceivable to control the IC utilizing outside advanced hardware, for example, miniaturized scale controllers and PCs. The APR9600 has a 28 pin DIP bundle. Supply voltage is between 4.5V to 6.5V. Amid recording and replaying, current utilization is 25 mA. Out of gear mode, the present drops to 1 mA. The

APR9600 trial board is an amassed PCB board comprising of an APR9600 IC, an electret receiver, bolster parts and important changes to permit clients to investigate all elements of the APR9600 chip.

G. Light Emitting Diodes

Light Emitting Diodes are utilized to sign of Red, Green signs for train landing for Platform close and flight for portable Platform open. It permits climate the physically challenged people to utilize the Platform when opening of portable Platform and demonstrate don't utilize the Mobile Platform when green sign is glowing. LEDs have numerous favorable circumstances over glowing light sources including lower vitality utilization, longer lifetime, enhanced physical power, littler size, and speedier exchanging.

H. L293D Motor control

L293D are fourfold high-ebb and flow half-H drivers. The L293 is intended to give bidirectional drive streams of up to 1 A at voltages from 4.5V to 36V. The L293D is intended to give bidirectional drive streams of up to 600-mA at voltages from 4.5V to 36V. Both gadgets are intended to drive inductive loads, for example, transfers, solenoids, DC and bipolar venturing engines, and in addition other high-present/high-voltage loads in positive-supply applications. The L293D is utilized to work a portable Platform unit and the elevator unit. To start with it controls the portable Platform to close or open between two intersection Platforms. At that point it controls the elevator unit to proceed onward the Mobile Platform.

V. SOFTWARE USED

➤ AVR Studio

For composing an Assembly Level Programming we should have editor, debugger and compiler to create HEX records which will be downloaded into the Chip through AVR ISP programming. To compose the source code we utilize manager, while composing the source code to check the grammar mistake all the while we utilize debugger at long last the error free source code is arranged to create the HEX document. The created source code after arrangement, it is

changed into HEX record which will be fused into the Microcontroller utilizing AVR ISP programming byte by byte till the end of HEX document through Parallel port. For composing an Assembly Level Programming we should have editor, debugger and compiler to produce HEX documents which will be downloaded into the Chip through AVR ISP programming.

BLOCK DIAGRAM

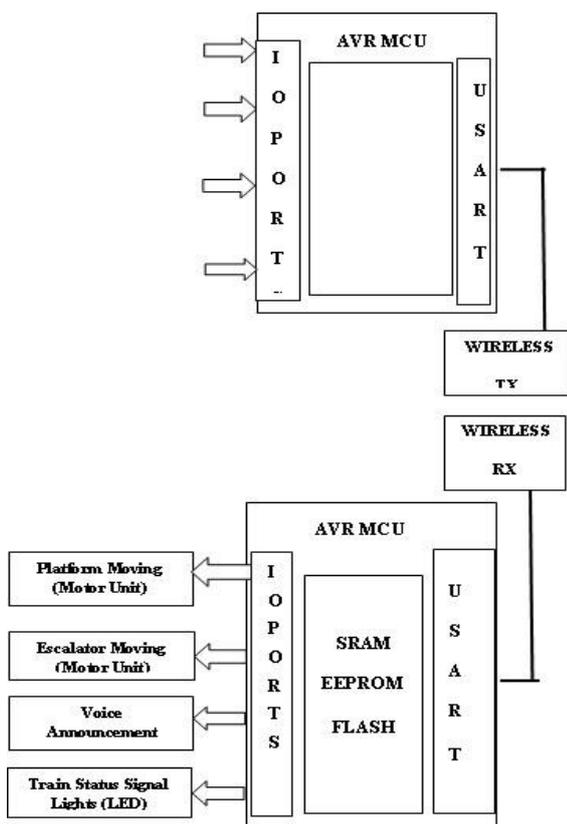


Fig.1 Block Diagram of Mobile platform

VI. Working Principle of Mobile Platform

At the point when the IR sensor senses the train entry, the voice declaration will alarm the general population to leave from stage. At that point the Platform will be shut by turning the rigging engine in opposite course. At the point when IR sensor sense trains flight, the voice declaration will suggest the general population to utilize the Platform and the Platform will be opened by pivoting the rigging engine in the forward heading. The IR sensor train checking unit is controlled by ATmega8 microcontroller. IR sensor associated with ATmega8 with transmitter of remote module. In controlling

unit another ATmega 8 microcontroller gets the train entry and takeoff through IR sensors by accepting sign by recipient of remote module. In the event that takeoff detected by IR sensors then the controlling unit allows to engine pivots to Platform open to interface the two intersection stages. At that point the Platform will moves like a lift to exchange the physically challenged people starting with one Platform then onto the next stage. The LED setup is utilized to show the Platform opening and shutting status.

Transmitter unit performs the fundamental operation of the programmed versatile stage. It comprise of AVR Microcontroller unit, Input Train landing and takeoff IR sensors, Wireless module transmission segment and USART RS232 link association. Following of a train is detected by sensor, this is utilized for naturally close/open the versatile stage. Sensors are put on two sides of track to sense the movement of train.

The microcontroller will sense The receiver unit contains the accompanying yield parts from the control unit. They are as per the following:

1. Platform Moving Motor Unit
2. Escalator Moving (Motor Unit)
3. Train Status Signal Lights
4. Voice Announcement

The entire operation of the above parts is controlled by the ATmega8 microcontroller. These parts are associated with the ATmega8 microcontroller Input/output ports. Its operations are performed when the transmitter or train checking unit transmits the sign.

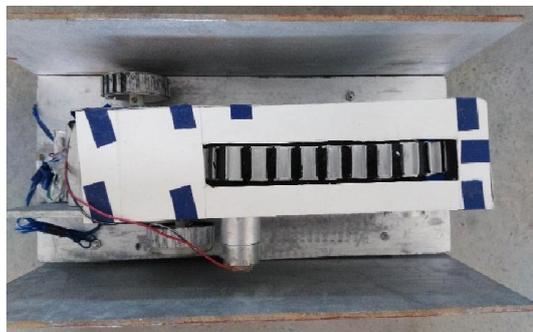


Fig.2 Escalator moving platform unit

Subsequent to moving portable platform in the middle of the railway Platform the lift from the Mobile Platform starts to move. The elevator ceaselessly moves until the train touching base to the station. The portable Platform put between two intersection Platforms and the elevator moves. At that point the physically challenged people will utilize the Mobile Platform to cross the railway platforms. The elevator is equipped for keep high weight to at once three are five physically challenged people utilize the portable stage.

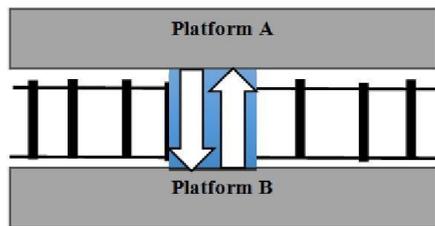


Fig.3 Escalator Rotation on the platform

V. Advantages

- It gives a smart facility to the physically challenged people.
- The voice declaration and sign gives more security.
- It is completely program medic.

VII. Conclusion

The programmed Mobile Platform gives the brilliant office to the physically challenged people in railway intersection to cross the Platforms without utilizing flyovers. This framework gives an extreme change of Indian railway system. The framework gives completely programmed control. If there should be an occurrence of crisis the manual operation office gave to close the stage. In a future the framework will be enhanced by utilizing most recent innovation which gives a shrewd use of the framework. The portable Platform limit of bearing weight will be expanded by utilizing pressure driven plates which have the ability of extremely solid, stainless and keeping high limit of weight.

VIII. REFERENCES

- [1]. J. Banuchandar, V. Kaliraj, P. Balasubramanian, S. Deepa, N. Thamilarasi "Automated unmanned Railway Level Crossing System", International Journal of Modern Engineering Research (IJMER) www.ijmer.com Vol.2, Issue.1, Jan-Feb 2012 pp-458-463 ISSN: 2249-6645.
- [2]. Sudarsan .P, Ram Kumar. S, Surendar.R, UdaySankar. T, Karthik "Artificial railway platform for domestic railway station" proceedings of 21st IRF International Conference, 15th March 2015, Chennai, India, ISBN: 978-93-82702-78-8.
- [3]. Prashantha B, Harisha S "Smart railwaycrossing embedded with automated platform bridge" issue on August 2015 by IJRET in 2321-730.Engineering and Technology eISSN: 2319-1163.
- [4]. Manu Kanchan & Ankur Bansal "Conceptual design to transfer handicapped and old people from one railway platform to another" issue on 2014.
- [5]. Silla, A. and J. Luoma (2011). "Effect of Three Counter measures against the Illegal Crossing of Railway Tracks". Accident Analysis and Prevention, Volume 43, Issue 3.
- [6]. Delmonte, E. and S. Tong (2011). "Improving Safety and Accessibility at Level 29 Crossings for Disabled Pedestrians". Report Number T650. Rail Safety and Standards 30 Board, London, United Kingdom, February 2011.
- [7]. U.S. Department of Transportation, Federal Railway Administration (2010). "Railway Trespassing, Vandalism, and Highway-Rail Grade Crossing Warning Device Violation Prevention-Strategies".