

A Review Paper on Arduino Based Platform Height Adaptation For Train

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Abstract

The objective of the project is to reduce the cost of the maintenance of Indian railway and also lots of man power can be reduced by using this project. In The Indian Railways system it is become more necessary to avoid the accident to prevent such kind of accident this technology is used to avoid major accidents.

The main objective of this project is to measure distance between footboard and ground by using Arduino system, when the train arrives at the station, platform acts as an obstacle between footboard and ground.

Arduino system will again measure the distance between footboard and platform.

Arduino gives command to motor as per the distance calculated then the motors are rotated so that entire compartment is been lowered up to particular level.

In this way it becomes convenient for the passengers to step in and step out, and many hazardous accidents can be prevented.

Keywords: Arduino, Ultrasonic Sensors, microcontroller

INTRODUCTION

The purpose of the project is to reduce the cost of the maintenance of Indian railway and also lots of man power can be reduced by using this project. Railway has informed that height of 131 Platforms in Mumbai region will be increased within 8 months. This will required high man power and lots of money.

To overcome this problem we can use height adaptation mechanism in train, thus the distance between footboard and platform can be adjusted. This project contains major component like Ultrasonic

Sensors, Servo motors, Arduino. The project aim is to identify and review the current and emerging technologies that have been or can be implemented to ensure safety of passengers. The review includes analysis of human factors, cost and benefits, safety consideration and risk associated with each of the identified technology.

BLOCK DIAGRAM AND DESCRIPTION.

The block diagram fig(1) gives brief description of arduino based platform height adaptation for train.

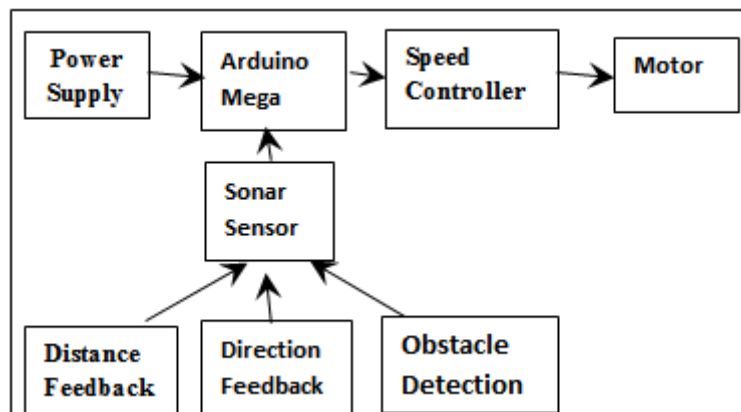


Fig (1)-Block diagram of Arduino based platform height adaptation for train.

WORKING

In current railway system, it is becoming more necessary to have a safety element in order to avoid accident. One of the important causes that can prevent serious accident. The main objective of this project is to measure distance between footboard and ground by using Arduino system, when the train arrives at the station, platform acts as an obstacle between footboard and ground. Arduino system will again measure the distance between footboard and platform. Arduino gives command to motor as per the distance calculated then the motors are rotated so that entire compartment is been lowered up to particular level. In this way it becomes convenient for the passengers to step in and step out, and many hazardous accidents can be prevented.

In this project two pair of ultrasonic sensor (sonar) are used. one pair is connected is to both side of the 1st coach of train and other pair is connected to the both side of last coach of train. When the train is moving sensor sends the rays which strikes the ground and reflect back to the sensor. Thus distance between ground and sensor measured. As train enters the station distance between ground and sensor is decrease due to platform. Arduino will guide servo motor mechanism, so that train will adjust its height according to platform.

ARDUINO MEGA

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 15 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), 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 microcontroller; 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 Mega 2560 board is compatible with most shields designed for the Uno. Arduino is used to guide the servomotors for adjusting the height by Arduino programing.

CONCLUSION

Recently Railway has informed that the height of 131 Platforms in Mumbai region will be increased within 8 months. Every two years height of the platform is increased manually according to the train footboard. The cost of increasing the height of a single platform is approximately 18 Lacs. The cost of sensor and controller in this project is approximately 1.5Lacs which is a long term investment. These causes reduce in manpower, manual work, cost of future expansion and maintenance.

PID Controller is used to reduce the vibration and smoothening of operation. Detect and avoid imbalance of track.

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