

Smart Railway Track for Disabled & Aged Persons

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Abstract - Today the cheapest mode of transportation is railway but now no. of accident of railway are increasing due to careless railway crossing. Careless in operations and lack of knowledge of workers are main reason of this, therefore we are trying to find solution of this problem. This paper gives new smart railway track mainly for helping physically disabled and aged persons. This railway track is automatically works in railway platform. Normally two platforms are connected by mobile platforms through which passenger can walk. We placed two sensors at both sides of track. With the help of sensors we are trying to automatic control of railway gates. When train arrive first sensor the mobile platform will be automatically close and train go through track and when train leaving second sensor the mobile platform will automatically get open. To sense the presence of train we are using microcontroller. By sensing the train on one path we are giving pulses to the stepper motor to open or close the mobile platform

Key Words: DC Motors, IR Sensors, Microcontroller

INTRODUCTION

In India today railway system is completely manmade. Normally we use bridges in railway stations. For the elderly persons or handicapped persons it is too difficult to use bridge to overcome this problem we are trying to find solution. The tracking of a train is sensed by sensor and automatically close or open the platform. For sensing the motion of train we are placing sensors at both sides of track. With the help of infrared sensor the microcontroller will sense the presence of train. So on sensing the train on one path, the controller will give pulses to the stepper motor to close t The main objective of Smart Railway Tracking System is to support the physically handicapped Passenger to move from one Platform to another. It is difficult to Cross the railway track inside the railway station. But it is more difficult to the handicapped and aged persons to cross the railway track without the help of others. In this paper the agents make use of a set of resources - train characteristics, driving rules and information about other trains - to generate their action policy. The proposed system uses sensor for opening and closing of bridges. It also confirms the presence of the train using a sensor which is placed at a certain distance away from the platform. When persons

try to cross platform by avoiding the over bridge there is chance for the accidents. This can be avoided by using this technique and very helpful for disabled person also.

In the Indian railway physically handicapped individuals and aged persons are use trams and flyovers to cross the railway Platforms, so they feel difficult. To loss this issue, a Smart Railway Track is introduced in this paper. At the point when there is no train arriving in the station, the versatile Platform will be opened and therefore moving. The physically handicapped people and aged persons will utilize the moving Platform to pass the intersection Platforms. The train entry signal will be given in a voice framework and demonstrated by LED signal. The proposed framework gives a superior answer for exchanging of physically handicapped people and aged persons in one Platform to another Platform without utilizing fly overs. Now a day all over the world accidents are common because of lack of technology, human carelessness at right time. And these accidental barriers cannot be completely avoidable but some fruitful steps definitely reduced to some extent, in account of this the initiative steps is required to avoid many humans death at any place and time by introducing new technologies, this effort has been taken in this work by adopting automatic railway gate opening without gate keeper near level crossing and automated platform bridge. The above said system works on microcontroller based technique and rack and pinion mechanism which is employed to operate Platform Bridge.

1.1 Existing System

The existing system is partially manmade and there is no any type of indication for train arrival. There is no any type of 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 and handicapped persons feel difficult to cross. [1]

1.2 Infrared Sensor [2]

An infrared sensor is an electronic device that emits and detects infrared radiation in order to sense some aspect of its surrounding. It can measure the heat of an object, as well as detect motion. In a typical infrared sensor like a motion detector radiation enters the front and reaches the sensor itself at the center of the device. An infrared sensor is an electronic instrument which is used for sensing certain features of its atmospheres by emitting or sensing infrared radiation. Infrared sensors are also capable of measuring the heat being emitted by an object and detecting motion. Infrared waves are not observable to the human eye. In the electromagnetic band, infrared radiation can be found between the visible and microwave regions. The infrared waves normally have wavelengths between 0.75 and 1000µm. The wavelength region which ranges from 0.75 to 3µm is known as the near infrared regions. The region between 3 and 6µm is known as the mid-infrared and infrared radiation which has a wavelength greater higher than 6µm is known as far infrared.

Infrared technology applications in many everyday products. Televisions use an infrared detector to read the signals sent from a remote control. The main benefits of infrared sensors include their low power requirements, their simple electrical system and their transportable feature.

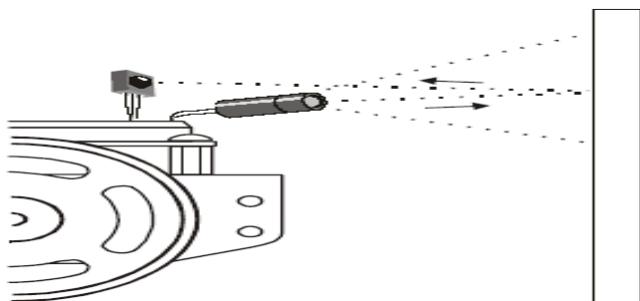


Fig -1: Infrared Sensor

1.3 Working Principle of IR

The IR detector is only looking for infrared that's flashing on and off 38500 times per second. It has built in optical filters that allow very little light except 980nm IR. It also has an electronic filter that only allows signals around 38.5kHz to pass through. When IR rays gets emitted from led, it moves in the direction it is angled. When any obstacle interferes in the path, the IR rays get cut and it produces secondary wavelets which propagates mostly in return direction or in a direction opposite to that of the primary waves, which produces the net result like reflection of IR rays.

1. PROPOSED SYSTEM

The detection process is mainly classified into two steps i.e. train detection and human detection. The train detection determines the train position to prevent a train from being mistaken.

2.1 Train detection

Collecting information from the station PC train position can be detected. We can also detect it by using an IR sensor placed along the track. Now trains travelling on a railway line obey various safety standards but On the other hand, it also have to manage number of new challenges and are under economic pressure to improve and optimize significantly their operations in terms of track occupancy, safety, productivity and customer satisfaction



Fig -2: Train Position Identification

The IR sensors are connected at the track to identify the arrival of train. The PIR sensor is connected at the two ends of the bridge to identify whether anybody on the bridge. The system consists of data acquisition unit, processing unit and information multicasting unit. Data acquisition unit are use to collects or gathers information about different train details such as timing of train, whether train has been late or whether it has been cancelled etc. Processing unit are use in opening and closing of the bridge and information multicasting unit provides alerting messages to different clients such as security person, station master etc

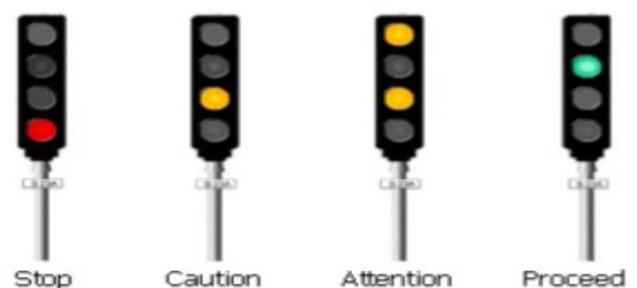


Fig -3: Alert Signal

A. Stop: This needs a passenger to stop and wait for next instruction proceeds. This also indicates a danger sign. This signal is provided 10min before the arrival of train.

B. Caution: These signal warnings persons not to enter the bridge or who were on the bridge have to leave as soon as possible. It also indicates the next symbol is a sign for train arrival. This signal is given 15min before train arrival.

C. Attention: This shows that the train is ready to move and the bridge is about to close. It also alerts the passengers to get into the train.

D. Proceed: It indicates the bridge is now closed and the people who are waiting to cross the track can use the bridge [3].

2.2 Human detection

For protection purpose, the existence of human on the bridge is necessary. For that purpose a PIR sensor is placed along the bridge. When a human is sensed along the bridge an alarm will be produced to ready the security personnel before opening the bridge. The detection results of dangerous factor in platform monitoring area mainly classified such a situations like a fallen object in the area. The versatile Platform is joined in the middle of the railway tracks in the side of the intersection Platform. To determine object the proposed system considers only movements in monitoring area in OFF state. Moreover, it detects object coming from outside of dangerous area by using backtracking method which tracks movements in previous frames.

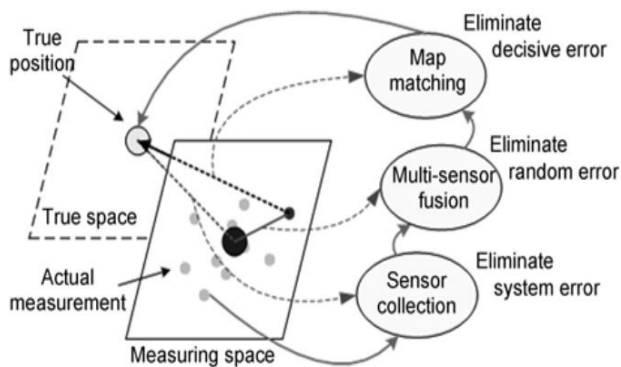


Fig 4: Principle of GNSS-based train integrated positioning

The various blocks in the block diagram are Microcontroller, Sensor arrangement, Audio and visual indication, Driver section and Power supply

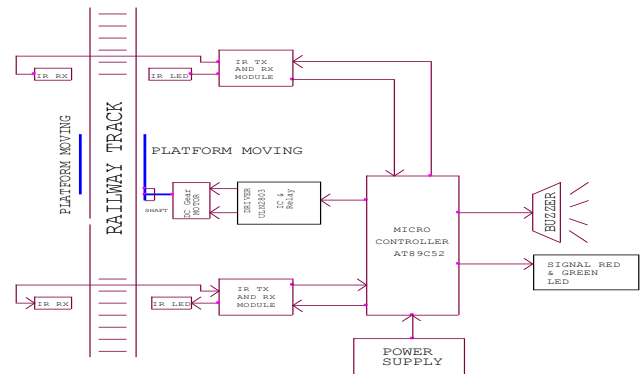


Fig -5: Block Diagram for Automatic Railway Platform Control

2. RESULT

This project experimentation is used for automatically close/open the mobile platform .Thus the sensing continuously when the train arrives and pass through. Thus it saves the time for passengers to cross the next platform and also safe for the physically disabled and aged persons.

3. CONCLUSIONS

The aim of this paper was to develop a project that could help the physically handicapped and aged persons to cross the railway platform in easy manner.

Thus the tracking of train is sensed continuously, which automatically close/open the mobile platform is partially automated which is beneficial for passengers to cross the rail grade crossing.

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