



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

AUTOMATIC RAILWAY TRACK FAULT DETECTING USING WIRELESS NETWORK SYSTEMS

R.SARAVANAN¹, M.SELVA BHARATHI², R. SHUBIKKSHA³, B. ABHINAYA⁴, K.SARANYA⁵

1 2,3,4,5 UG STUDENTS

ELECTRICAL AND ELECTRONICS ENGINEERING

VIVEKANANDHA COLLEGE OF TECHNOLOGY FOR WOMEN, TAMILNADU, INDIA

ABSTRACT

The main objective of this project is analysis for the crucial situation occurs in the automatic train system. In the railway surveying in many accidents cause multiple damage for life and also our property. So that this project to implement in two ways to save the train travel. For the one way is to determine the malicious in the train track incessantly, whether the track stipulation is good or not for use the vibration Sensor to check it. Next for them to avoid the obstacle crossing in train track, when the train is come. The main aspire in this project is to help our railway department to improve the automatic process. Also develop the requirement tools needed in that safe travel. But still the train collisions occur in may place not yet decreasing one. To control the main region in train system have been the gate level operation to using stepper motor in real time analysis. This is accurately done by using the proteus tool to get the better result.

Keywords: Track Fault, railway surveying & Wireless network system

1.1 INTRODUCTION

Railway is lifeline of India and it is being the cheapest modes of transportation are preferred over all other means of transportation when we go through the daily newspapers we come across many accidents in railroad railings. Rail road related accidents are more dangerous than other transportation accidents in terms of severity and death rate etc. therefore, more efforts are necessary for improving safety. collisions with train are generally in that the destructive forces of a train usually no match for any other type of vehicle train collisions form a major catastrophic, as they cause severe damage to life and property train collisions occur frequently including all the latest technology.

1.2 PROJECT BACKGROUND

Railway safety is a crucial aspect of rail operation the world over. malfunctions resulting in accidents usually get wide media coverage even when the railway is not at fault and give to rail transport, among the uninformed public, an undeserved image of inefficiently often fueling calls for immediate reforms. this paper is aimed at helping the railway administrations concerned to strengthen their safety culture and develop the monitoring tools required tools required by modern safety management. r a i l r o a d intersections are very unique, special, potentially dangerous and yet un avoidable in the world. A two different responsibilities Domains, performance come together and converge for a single cause of providing a facility it the road user. during the normal operation also there is every possibility of accidents occurring even with very little negligible in procedure and the result is of very high risk .the potential for accidents is made higher as the railways control only half the problem .the other half, meanwhile, cannot really be said to be controlled by one entity,

as even through traffic rules and road design standards supposedly exist, the movements of road users are not organized and monitored by one specific entity as rigidly as rail movements. The railways systems of Asia and the Pacific are no exception to each year, accidents at level crossings not only cause fatalities or serious injuries to many thousands of road users and railway passengers but also impose a heavy financial burden in terms of disruptions of railway and road services and damages to railway and road vehicles and property. A very high number of these collisions are caused by the negligence, incompetence or incapacity of road vehicle drivers, who by and large operate their vehicles in environments in which safety consciousness is practically non-existent. Since it is the railways which must bear the responsibility for ensuring that it is protected from the transgressions by road user it is the railways which also has to shoulder most of the financial burden of providing this protection similarly, it is the railway, which has most of the responsibility for educating road user on the safe use of its level crossings. Notwithstanding this, it appears that in many regions, railways.

1.3 SCOPE

Review the present status of level crossing accidents and train collisions.

Present statistics, indicators, technology and problems relating to the systems adopted for railway protection in practice

Analyze various alternative systems for train collision avoidance; and

Make recommendations pertaining to the selection of cost effective protection systems.

1.4 METHODOLOGY

Evaluation of the requirements of a safety management information system which adequately addresses the needs of railway management for information on train collision avoidance performance.

Review of the essential safety, enhancements, measure and priorities for railway security.

Assessment of level crossing safety performance and safety measures

Examination of cost benefit analysis of investments on level crossing safety enhancement.

Review of the technical attributes and suitability of networked anti-collision system for level crossing protection system.

1.5 ORGANISATION

Are ill-equipped to be in a position to monitor level crossing safety effectively and to take both corrective and proactive measures to improve the safety of their level crossing installations. In rapidly flourishing country like ours, even though all the later technologies are there train collisions are occurring frequently. The railway accidents are happening due to the carelessness in manual operations or lack of workers. The other main reasons for the collisions of train are:

Train derailment in curves and bends, running train collisions with the standing train, Train accidents in slopes, 4 mis-signaling due to fog or mist.

There are no fruitful steps have been taken so far in these areas.

This project deals about one of the efficient methods to avoid train collision and derailment.

Also by using simple electronic components we tried to automate the control of railway gate in an embedded platform.

The system has been implemented and demonstrated by using vibration sensor with the help of Arduino.

2. LITERATURE REVIEW

2.1 EXISTING SYSTEM

The existing system conventional signaling system most of the times rely on the oral communication through telephonic and telegraphic conversions as input for the decision making in track all location for trains. There is large scope for miscommunication of the information or communication gap due to the higher human interfaces in the system. This miscommunication may lead to wrong allocation of the track for trains, which ultimately leads to the train collision. The statistics in the developing countries showing that 80% of worst collisions occurred so far is due to either human error or incorrect decision making through miscommunication in signaling and its implementation.

IR sensors are also used to identify the cracks in the railway. IR sensors have limitations due to the geographic nature of the tracks. the anti-collision device system also is found to be ineffective as it is not considering any active inputs from existing railway signaling system, and also lacks two ways communication capability between the trains and the control centers or stations later geographical sensors have also been used which makes use of satellites for communication but the system is costly and complicated to implement. At present laser proximity detector is used for collision avoidance, IR sensors identifies the cracks in the railway track and gate control is done by manual switch controlled gate but there is no combined solution for collision between trains, train derailment in curves and bends and the automatic control of railway gate.

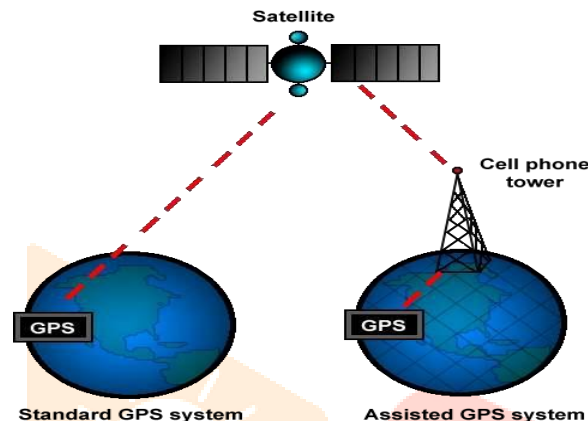


Figure: 1 Existing system

2.1.1 EXISTING SYSTEM WORKING

Manual/physical gate closing & opening.
Manual switch based gate closing & opening.

2.2 PROPOSED SYSTEM

RAILWAY SECURITY MONITORING SYSTEM USING VIBRATION SENSOR

The proposed train anti-collision and level crossing protection system consists of a self-acting microcontroller and two way based data communication system which works round-the-clock to avert train collision and accidents at the levels crosses. Thus enhances safety in train operation by providing a non-signal additional safety overlay over the existing signaling system. The system operates without replacing any of the existing signaling and nowhere affects the vital functioning of the present safety system developed for train operation. The proposed system gets data from the vibration sensor.

The efficiency of the system is expected to be considerably increased as the proposed system takes inputs from the sensor and also from the level crossing gates. As more relevant data are included, it is expected that the present system may assist loco drivers in averting accidents efficiently, As no change is necessary to be made to the infrastructure of the existing system, the cost of implementation of this system is also less. The system has been designed and simulated using proteus real time simulation software.



Figure :2 Proposed System

2.3 OVER VIEW OF THE PROPOSED SYSTEM

The sensors sense the input and sends to the microcontroller, where it responds and gives command to the particular component with predefined algorithm. The time parameter is crucial which can be easily changes and modified using Micro - controllers. Thus, this device would work in coherence would help to the reduce train collision.

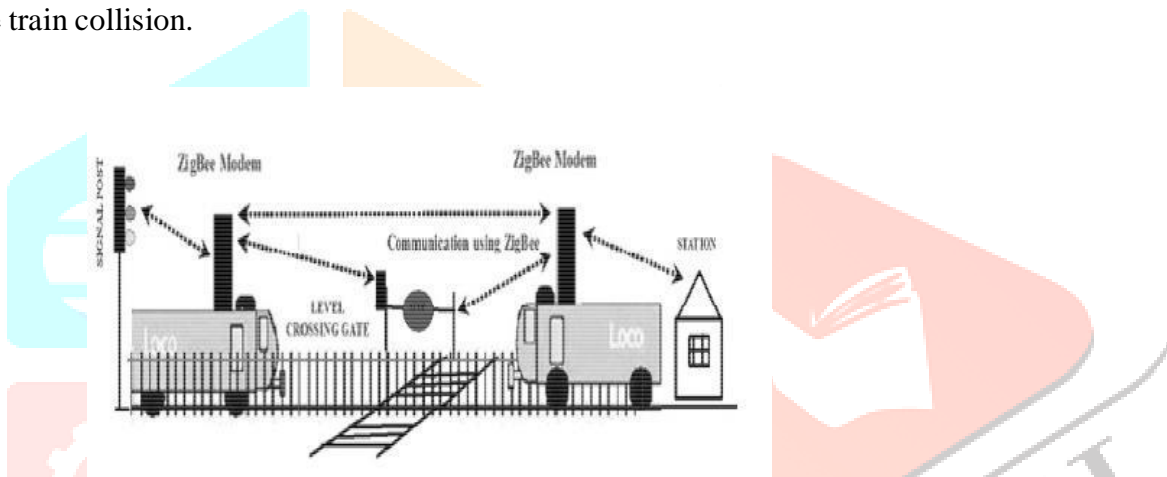


Figure :3 Over view of proposed system.

2.4 BLOCK DIAGRAM

In our project the entire system can be classified into two systems. The first system can be placed in the train section side and second system can be placed in the robot side.

The system in the train section consists,

The system in the robot section consists,

The fundamental block diagram of train side and robot side are shown below

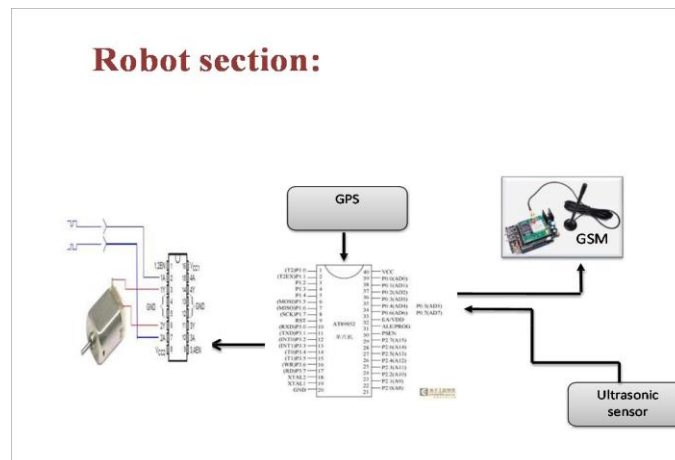


FIGURE: 4 BLOCK DIAGRAM OF ROBOT SECTION

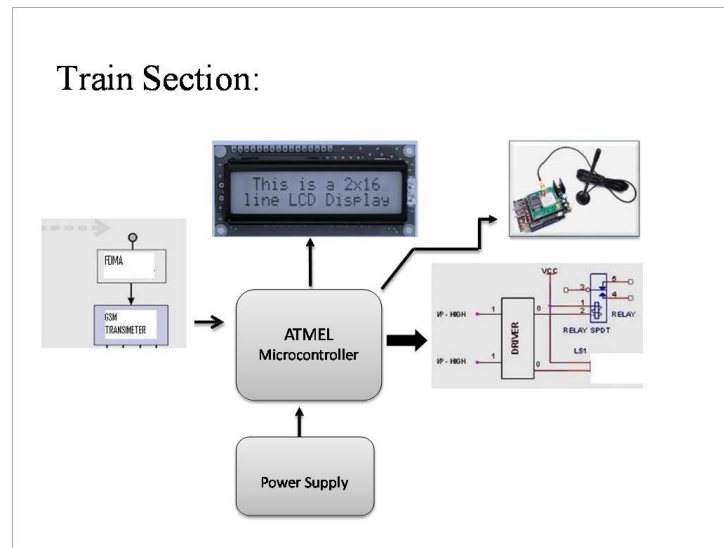


FIGURE:5 BLOCK DIAGRAM OF TRAIN SECTION

2.5 BLOCK DIAGRAM DESCRIPTION

The sensors sense the input and sends to the AC AI Arduino where it responds and gives command to the particular component with predefined algorithm. The time parameters are crucial which can be easily changed and modified using Arduino. Thus, this device would work in coherence would help to reduce the train collisions.

3. CONCLUSION

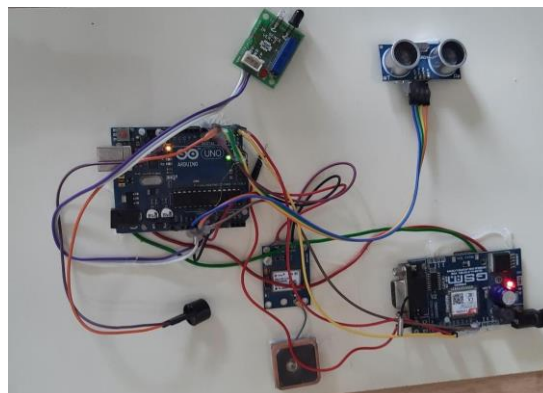
Collision avoidance system are especially useful in bad weather conditions. In this paper, a design for automatically averting train collision and accidents at level crossing gate have been designed, simulated, and tested.

It uses the advanced features of pic microcontroller with vibration sensor and ZigBee communication technique, proves to be effected in achieving the object.

It is application at every aspect of the railway for uninterrupted service Saving human life, protection against accidents and the communicable electronic systems are the features and economical and the added advantage of this project.

From the above discussion and information of this system we, up to now surely comes to know that it is highly reliable effected and economical at dense traffic area, suburban area and the route where frequency of trains is more. As it saves some auxiliary structure as well as the expenditure on attendant it is more economical at above mentioned places then traditional rail way crossing gate system.

4. MODEL



5. REFERENCES

- [1] Emad Aboeela, William Edberg, Christos Papakonstantinou and Vinod Vokkarane, “Wireless Sensor Network Based Model for Secure Railway Operations”,2006.
- [2] Cai Guoqiang, Jia Limin, Zhou Liming, Liang yu and Li xi, “Research on Rail Safety Security System“, World Academy of Science Engineering and Technology, pp. 1405-1410, 2010.
- [3] R. Pitchai Ramasamy¹, M. Praveen Kumar¹, S. Sarath Kumar and R. Raghu Raman,” Avoidance of Fire Accident on Running Train Using ZigBee Wireless Sensor Network”, International Journal of Information and Computation Technology, Volume 3, Number 6, pp. 583-592, 2013.
- [4] Kuncham Viswa Teja¹, Suresh Angadi²,” Fire Detection and Notification System in Trains”, International Journal of Innovative Research in Science, Engineering and Technology, Vol. 2, Issue 4, pp. me 96– No.25, pp.32-35, June 2014.
- [5] Kalpana Sharma¹, Jagdish Kumawat², Saurabh Maheshwari³, Neeti Jain⁴,” Railway Security System based on Wireless Sensor Networks: State of the Art”, International Journal of Computer Applications, Volume 96– No.25, pp.32-35, June 2014.
- [6] Shilpa Bharathan, Shameem B P, Savitha T, Assistant Prof. Mr. P. Vimal Kumar,” Advanced Security System in trains using RF Module”, International Journal of Advanced Research in Electronics and Communication Engineering, Volume 4, Issue3, pp.543-547, March 2015.
- [7] 1R. Immanuel Rajkumar, 2Dr.P. E. Sankaranarayanan, and 3Dr.G. Sundari,” Real Time Wireless based Train Tracking, Track Identification and Collision Avoidance System for Railway Sectors”, International Journal of Advanced Research in Computer Engineering & Technology, Volume 3, Issue 6, pp.2172- 2177, June 2014.
- [8] M.D. Anil¹, Sangeetha.S², Divya.B³, Niranjana.B⁴, Shruthi.K. S,” Advanced Railway Accident Prevention System Using Sensor Networks”, International Journal of Advanced Research in Computer Engineering & Technology, Vol. 3, Issue 5, pp.6730-6732, May 2014.

