

Tracking of Train Crossing in Indian Railways

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Abstract - Advancement of populace is specifically related to transportation office. In India, transportation offices are primarily taken care of by Indian railroads. Indian railroads every day transporting 14 million travellers by 2 million kilometres rail track per day. Safety is of exceptional centrality to Indian railroads. With the fast advancement of society and the ceaseless advancement of people's quality of life, individuals have put forward higher prerequisites for the unwavering quality and reliability of high-speed railroad transportation. Within the current railroad framework, it is getting to be ever more essential to have safety components in arrange to maintain a strategic distance from mischances. One of the vital causes that can incite serious mischances is the presence of impediments on the tracks. Fitting appropriation of technology would help consistent organization of assets that would emphatically impact the country's economy

Index Terms –Online portal, IOT, Railway Tracking, Safety Prediction, Message alert.

I. INTRODUCTION

We have seen how much of our lives have been made simple by means of live tracking apps. If we require to go to some place and require a cab, for that booking it's through Ola or Uber. Other executions incorporate tracking your online orders in real time, tracking trains and buses you wish to capture etc. This leads to a decrease in manual power to keep track of all such subtle elements. But this include isn't utilized as much because it can be. This include of live tracking is utilized in keeping track of stations right presently by railroads. But it is not utilized to keep track of the examinations and checks performed at the stations. This may reduce the sum of printed material and manual control included in such errand. Development of populace is specifically related to transportation facilities. In India, transportation

offices are primarily taken care of by Indian railroads. Maintenance and schedule checking of railroad tracks may be a huge issue. In this paper we proposed a strategy for genuine time following of rail track for upgrade and schedule check-up. In Our proposed strategy, openlayer-2 is utilized for execution purposes. Within the proposed strategy, we give subtle elements on the prepare track inside openings of 30-40kms. Entire prepare track is partitioned into different openings with a range of 30-40kms length. Amid the support period or routine check-up of tracks, Support group is able to discover out the assessed track, and the uninspected track inside 30-40kms range. Green line from one point to another point of rail track appears that the track is effectively reviewed and no assist review is required. Red line appears the track length which has not been reviewed effectively. The objective of this original copy is to supply data around reviewed and uninspected rail tracks inside 30-40kms extend consequently for the support group.

The railway track management system is a software project that supports the railway track system services as per train schedules. The project is designed with a good GUI that allows monitoring and controlling various trains on the network. It has happened so many times that you have been waiting at the railway station for someone to arrive and you don't have any exact information about train timing and other stuff. The track management system operates on train schedules and lays appropriate tracks for trains to pass as per their decided route. The Train management software has been designed to support and maintain data for multiple trains on the rail network.

II. LITERATURE REVIEW

India could be an exceptionally quick developing nation all through the world. Getting to be a developed country, by and large advancement is exceptionally much required like instruction, inquire about, most recent technology, quality of administrations, work and transport etc. In India, expansive volume of passengers are traveling through Indian railroads which increments additional stack on rail tracks. Because of the active plan of railroad tracks, it is exceptionally difficult to oversee schedule maintenance of tracks physically. The traveller has the alternative to track the trains in real time. Train's physical area will appear within the outline with the place the train is voyaging. Passengers can select a specific prepare and after that prepare points of interest, such as past station, following station, prepare begun date and anticipated time to reach the following station are appeared to the client. The course secured by the prepare is appeared as a yellow line & and the course to be secured will

show as the dashed yellow line. The trains right now running on time will be appeared in blue colour & and trains currently running late will be shown in red colour. Here if the crack is detected, then the system is automatically stopped, in case of land mine detection the system gives buzzer sound. To send the latitude and longitude values of crack on the track to the mobile number by using GPS and GSM technology to develop a prototype of the module. Further most of the modules can be embedded along with the microcontroller in a single board and thereby reduce the size of system. Ultrasonic Sensor and Infrared Sensors are used for detecting cracks and obstacles in the track. Openlayer2 is second hand for implementation of active maps and trustworthy to show outline, vector facts and markers shapely from any beginning. Javascript, MySQL, Java and HTML are different operating system packages that are required all the while implementation process.

III. LITERATURE SUMMARY

The summary of the literature is depicted in table 1. Table

1: Summary of Literature Survey

Sl. No	Paper Title	Year of Publication	Methodology	Findings
[1]	Train Tracker using GPS System	May- June 2018	When combined with other sensors, computers, and communications systems.	When we open the message url in phone browser, it will show the location in the Google map and every 30 second page will be restarted.
[2]	Train Tracking and the Signalling System using Infrared and Radio Frequency Technology	Jan 2020	Infrared (IR) sensor, Rf Transceiver, AT89S52 microcontroller	Tracking of the system using IR sensors and RF Technology may enable the rail department to safeguard human life from accidents
[3]	TRAIN TRACKING SYSTEM BASED ON GPS & GSM	June 2019	GPS, GSM	System can pinpoint the location and other attributes of an operational train in an economically accurate manner
[4]	Real Time Train Track Monitoring System	March 2018	PIC16F877A Microcontroller, IR sensor,	The advantages include less cost, low power consumption and less analysis time
[5]	Train Tracking and the Signalling System using Infrared and Radio Frequency Technology	Jan 2020	AT89S52 microcontroller.	Technology may enable the rail department to safeguard human life from accidents.
[6]	An online railway traffic prediction model	Jan 2019	Railway traffic, Train descriptors, Monitoring, Timed event graph, Prediction	Train interactions are modelled with high accuracy by including the main operational constraints and relying on realized corresponding minimum headway times
[7]	Railway Applications for Monitoring and Tracking Systems	May 2020	This includes an overview of the development of Global Navigation Satellite Systems for rail applications and recent research and innovations	Particular attention is paid to the analysis and discussion of the application of satellite navigation systems for real-time tracking of railway assets, and the benefits these systems could bring

[8]	Real-Time Tracking Distributed Acoustic Sensing Data	Trains from 2020	DAS; fiber optic sensing; train tracking; pattern recognition	High accuracy differential satellite positioning systems (D-GNSS), such as GPS or Galileo, become available and are certainly planned to be applied in future railway systems.
[9]	GPS/GSM based train tracking system – utilizing mobile networks to support public transportation.	Aug 2018	ICT combined with latest mobile and wireless technologies can be used effectively to streamline government activities and public service delivery process to improve productivity	Positioning data along with train speed helps the administration to identify the possible safety issues and react to them effectively using the communication methods provided by the system.
[10]	Railway Track Monitoring Using Train Measurements: An Experimental Case Study	13 November 2019	Gsm, microcontroller, IR sensors	A new representation of the signal is proposed to show the signal energy level as a function of train location. It is shown that the forward speed of the train has a considerable influence on the energy level of the signals
[11]	Real Time Train Track Monitoring System	March 2018	GSM, MICROCONTROLLER, SENSOR, SIGNALS	GPS, IR sensor which will be mounted in between the track where the two different tracks are getting joint
[12]	A multi-objective and dictionary-based checking for efficient rescheduling trains	18 January 2021	The GKACO algorithm is utilized for optimizing the constraints and attaining the optimum rescheduled timetable	The rescheduling of trains should make certain traffic order and effectiveness and adjust train movements as per the schedule as possible
[13]	Prediction of Train Arrival Delay Using Hybrid ELM-PSO Approach	JUNE 2021	This paper proposes a hybrid model of ELM and PSO for train delay prediction.	ELM can overcome the shortcoming of backpropagation training algorithms
[14]	Data Reading Algorithms for WSNs Railway Monitoring	August 8th, 2020	decision maker; railway; algorithm; information system	It is an information system and communication issue to read the maximum data sent from sensors to the control unit of the railway system, hence conducting to propose algorithms to solve it.

IV. METHODOLOGY

When there is some obstacle is present in front of the track or there is a presence of gap between two joining tracks, the IR sensor will detect the gap between the two tracks and indicate on LCD display and with the help of GSM and GPS system the authorized person of railway will be informed via SMS function. When the LDR and LED pairs are cut in the sequence, the alert message is sent via GSM about the NEXT STATION and it is displayed on LCD display. When there is RED light on signal pole, the RF transmitter will send the notification to the loco pilot to stop the train which is in the particular range or else the train will be stopped automatically. The cost of the proposed system is very less. It also checks surface and near surface of the cracking position. Transmitting signals are immediately transferred and accidents are reduced.

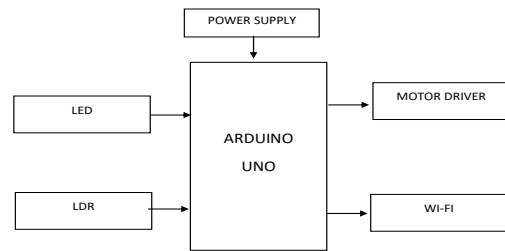


Figure 1: Methodology

It can work in any terrain 24*7 and detects cracks accurately. The system is robust and rugged to environmental changes. As more relevant data is acquired it is expected that the present system may assist loco pilot in averting accidents effectively. Since robot is made up of sensor unit it may get damaged anywhere while detecting and power consumption is more. The project is developed and designed to improve rail track management. The main aim of project is to reduce man power. By using this project, we can detect crack in railway track and obstacle on the track.

V. CONCLUSION

To release a real time railway track tracking system to minimize the search time required to find out inspected or uninspected track with an accurate location, cost effective. The proposed system provides the capability to track 30-40kms from current position of the railway track. The proposed system also provides information regarding the inspected track and uninspected track with other relevant information such as last inspected date, expected date of inspection, name of inspected team and major faults identified and correct during last inspection etc. Cracks in rails have been identified to be the main cause of accident in the past. Hence, solution of this problem, using robot to detect the cracks in railway track and when robot detect the fault it sends the message to base station. This system automatically detects the faulty rail track without any human interaction. There are many advantages with the proposed system when compared with the traditional detection techniques. The advantages include less cost, low power consumption and less analysis time. By this proposed system the exact location of the faulty rail track can easily be located. In Railway track fault detection, we are going to deal with two functions 1. Track fault detection and alerting 2. Alerting people when a train crosses the railway platform.

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