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RAILWAY SAFETY MANAGEMENT

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ABSTRACT

So the safety and facility of the passenger throughout the journey should be the prime concern of railway authority but with increasing population the number of people using the railway transportation has increased rapidly during years and the safety measures are neglected due to busy schedule since number of trains moving to and fro have increased and tracks are always busy. The solution to this situation can be, by developing a technology based solution where an on-track monitoring system is built to carry out regular safety check up involving train track crack detection and obstacle detection on the track, the monitoring system runs before the train every time and checks for the above parameters and if any problem occurred during the monitoring process the setup will notify the loco pilot on train which is approaching on the particular track and will indicate it to stop on-coach maintenance and alert system are installed to facilitate the passengers on-board during emergency. Railway crossing are installed with occupancy detection system to ensure the crossings are free for train to move which avoids accidents. An app is developed to monitor all activities happening which will be handled by railway authority unit and also a passenger app is developed to provide a better facility to the passengers.

KEYWORDS

Monitoring, Railway crossing unit, Ultrasonic sensor, Light dependent resistor, GSM module.

INTRODUCTION

This project is mainly streamed towards the safety of passengers travelling via railways and also provide necessary facilities for on-board passengers. The project This monitoring system runs before the train to ensure the safe journey by conducting a safety check up before the train approaches that spot, the system always leads the train and checks for the cracks and obstacle on track, the sensors and wireless device are installed on monitoring system to identify the cracks and obstacles and as soon any abnormalities are found on track, the monitoring system will alert the loco pilot on train to stop via wireless module.

To ensure the cleanliness of coach an maintenance feedback button is provided so that authority can take care of cleaning process in upcoming stations and a smoke detector is placed to alert if any smoking activity found inside coach also an emergency alert system is installed on coach to use it whenever required by passengers so that upcoming station can have ready facility to encounter emergency alerts as soon as train approaches the station. Most of the accidents are noticed near railway crossings, so to ensure the train can move near crossings easily, an occupancy monitoring system is installed which will detect if anything is blocking

the way of approaching train and then alert the loco pilot on train which is approaching the crossing via wireless modules. An app is developed for railway authority to monitor the abnormal parameters and take necessary action for safety of passengers and also an app for passengers is developed to facilitate the passenger.

2. RELATED WORK

Juyeop Kim [1] in the proposed system the arrival or departure of the train near level crossing determines the opening or closing of the level crossing gate automatically with the help of IR sensor and warning signal at level crossings. But there may be a chance that during this automation process, a vehicle may be locked between the crossing gates. At this situation, the obstacle between the crossing gates could be detected with the help of ultrasonic sensor and it will be intimated to the train through GSM module.

M. Kassim [2] this paper proposes a safe railway crossing system based on ZigBee communication which is low cost and power efficient. The major reason for proposing this system is to automate the system of railway crossing and avoiding the accidents.

E. Aboelela [3] this paper proposes a cost effective yet robust solution to the problem of railway crack detection utilizing a method that is unique in the sense that while it is simple, the idea is completely novel and hitherto untested. The paper discusses the technical and design aspects in detail and also provides the proposed robust crack detection algorithm.

3. PROPOSED METHOD

The basic idea of the proposed technique is:

On track monitoring system:

This monitoring system runs before the train to ensure the safe journey by conducting a safety check up before the train approaches that spot, the system always leads the train and checks for the cracks and obstacle on track, the sensors and wireless device are installed on monitoring system to identify the cracks and obstacles and as soon any abnormalities are found on track, the monitoring system will alert the loco pilot on train to stop via wireless module.

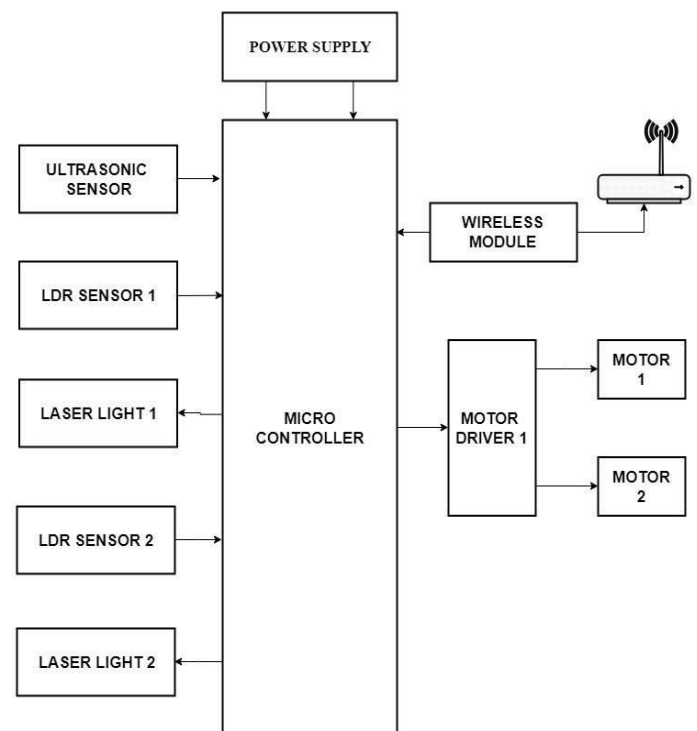


Fig. 1 On Track Monitoring Unit

On- Fig.1: On track monitoring unit alert system:

To ensure the cleanliness of coach an maintenance feedback button is provided so that authority can take care of cleaning process in upcoming stations and a smoke detector is placed to alert if any smoking activity found inside coach also an emergency alert system is installed on coach to use it whenever required by

passengers so that upcoming station can have ready facility to encounter emergency alerts as soon as train approaches the station.

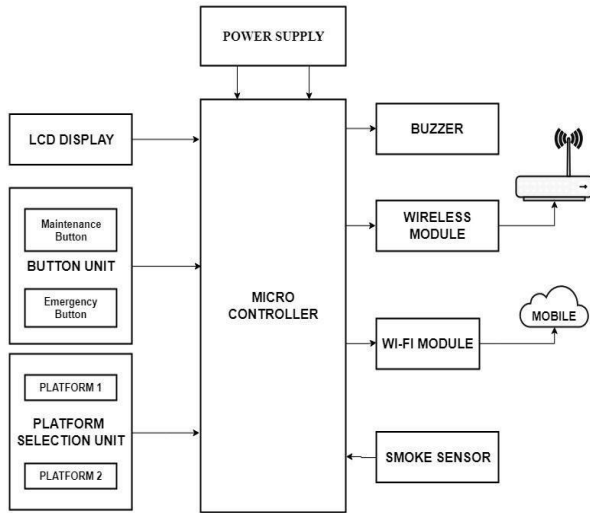


Fig.2: loco pilot control unit

Railway crossing occupancy detection unit:

Most of the accidents are noticed near railway crossings, so to ensure the train can move near crossings easily, an occupancy monitoring system is installed which will detect if anything is blocking the way of approaching train and then alert the loco pilot on train which is approaching the crossing via wireless modules.

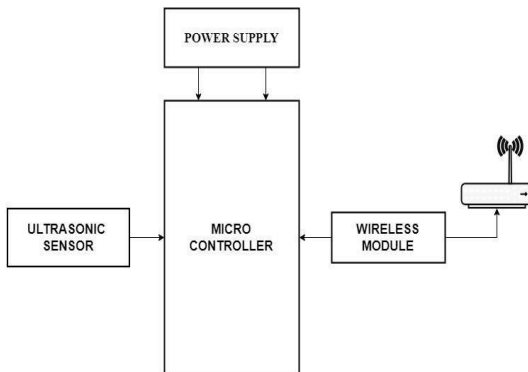
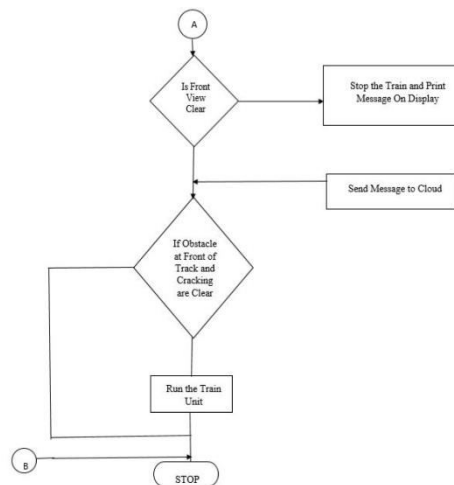
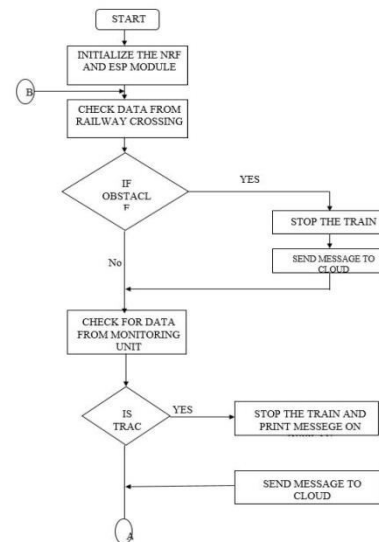
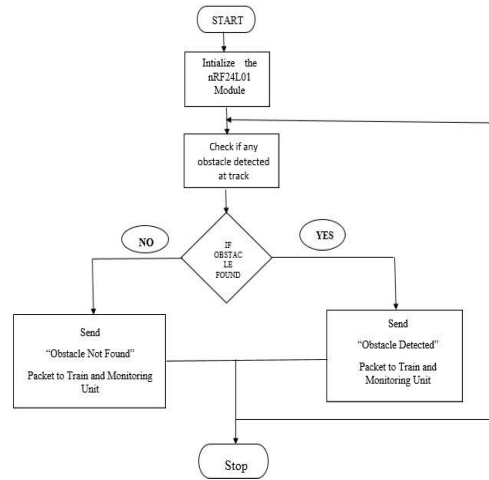
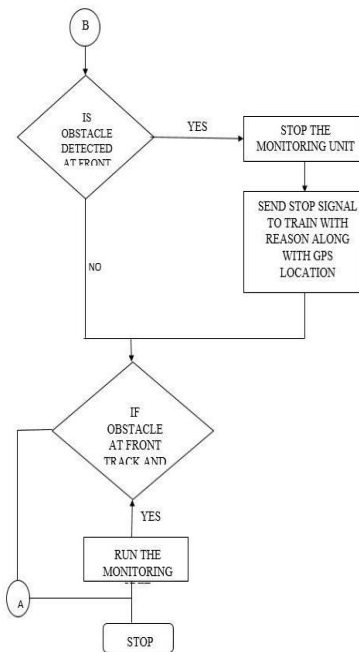
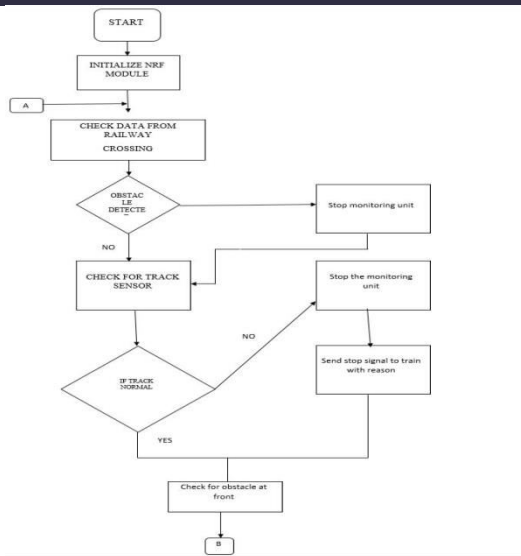


Fig.3: Railway crossing unit

FLOW CHART

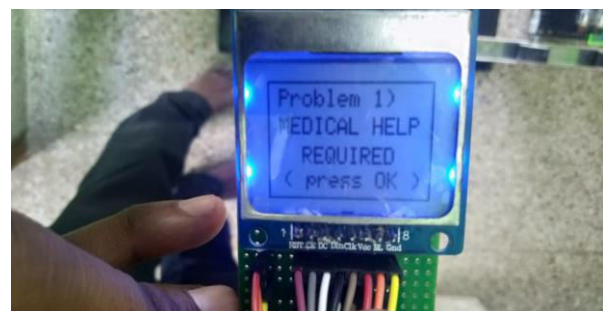
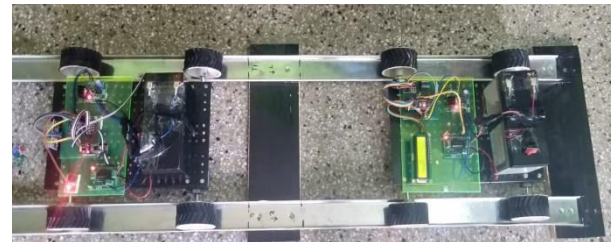




RESULT

In this project we have three monitoring unit which are railway on track monitoring unit loco pilot unit and railway crossing unit. In this the on track monitoring unit will monitor the objects in the railway track and also track the any cracks present in the track if any objects present on the track it will send the emergency command to the loco pilot and the railway department and the railway crossing unit which gives the presence of the obstacle in

crossing section and we also developed the on coach Maintenance which can be help to passengers if any problems appears to them like theft, coach maintenance, quality of food in the train and medical emergency etc. This project also provide Maintenance process tolerances, Verify and protect machine, systems and process stability Minimize downtime prevent failures and save businesses money and time.



CONCLUSION

Accidents are the major causes for traumatic injuries through obstacle detection unit. Ultrasonic sensor which continuously monitors the railway track through the sensors and detect any abnormality in the track. These project also helps to maintenance of trains, emergency of passengers in trains. The main challenge for WSNs in railway applications is determining the best measurement technologies to use. The WSN must be reliable and accurate to enable effective condition monitoring in

harsh and inaccessible environments but must also be cost effective. It must be possible to translate the sensor data from the WSN into relevant and clear information to enable decision support in the railway infrastructure maintenance lifecycle.

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