A STUDY ON CRACK AND OBJECT DETECTION ON THE RAILWAY TRACK

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ABSTRACT

The railway system of India is largest among the world railways system. With the great infrastructure and with immense human power. It is operating the country economy easily. The railway works 24*7 without any break. So with regards to safety measures. The factors such as crack and object detection on the track is important. The track needs time to time replacement and maintenance and if this not happen then the problem and safety occurs. So, this project which we are proposed, it is used to detect the crack and object on the railway track. In this project IR and ultrasonic sensor are used with GSM and GPS module. This system alerts the authorities by giving them prior message of crack and object on railway track. It gives the location where the crack has been found.

KEYWORDS: *GSM modem, GPS, microcontroller, IR sensor, ultrasonic sensor.*

1. Introduction

Railway is the life line of every growing country. Indian railway is one of the busy railway system all over the world about 2000 passengers trains and 1500 freight trains works daily. To ensure that those trains runs freely without any problem. Safety of those trains is must. So for this we use the network of sensor for obstacle and to detect the crack. For the detection of crack we are using IR sensor and for object detection we are use ultrasonic sensor. The information of crack and object is transmitted through GPS and GSM units. The GPS locates the latitudes and longitude. GSM send message to the mobile based application. This project have very high chance to change the traditional railway system in modern railway system.

2. Literature Survey

The existing system of crack and object detection depends on the telephonic communication. Is most commonly observed that the inspection is done by foot, locomotive trolleys because of this old technique of communication the chances of collision and derailment. This technique is not up to date for emerging country such as India. Another technique use the locomotive. These locomotive moves on the track. They uses leaser sensor but it is not very accurate for crack and object detection. Another approach is using LDR to detect the crack. The existing does not gives exact location of track and object on the track. They uses only GSM unit they do not uses the GPS which gives the exact location of crack and the object on track.

3. Objective of our Project

The main objective of our project is to identified the obstacle and crack on the railway track. It also ensure about the collision between the train and derailment in curves and bends.

4. Comparative Study

While studying the other project we found that the existing system used the LASER proximity detector which are not accurate for the emerging countries and no system is using the crack detection and object detection together. We use ultrasonic sensor and IR sensor for this system. The other prototypes used more components which makes the cost high. We used less components as compared to others.

The GPS and GSM module makes this system more reliable. Low power used as compared to others. Other system do not have any accurate alerting system for crack and object but our system gives the exact location and that location is send by a message.

4.1 Existing System

In existing system oral communication is used for detection of crack and object on the track. So this system is time consuming and we know that the time is very important in railway system. In existing system laser proximity detector is used and no system have object and crack detection simultaneously. The complexity and the cost of other project is also high.

Fig.1 Crack inspection trolley

4.2 Existing System Disadvantages

In the existing system there is delay in transmitting the information because oral communication is used. This effect the accuracy of the system and we want better accuracy of the system safety. And also cost is the major factor the major factor.

4.3 Problem Identification

The main problem has been the lack of cheap and efficient technology to detect problem on the railway track whether the problem is of crack or of the obstacle. Sometimes antisocial elements also the big problem for security of railway track.

4.4 Proposed Work

In our project we are using the IR sensor and ultrasonic sensor for crack and object detection respectively. By using IR sensor we find the crack on the track. When the crack is find on the track the robot stops and sends the coordinate by the help of GPS. The coordinate sends to the authority and them the authority comes and handle the situation. When the object is find out on the track. Then the robot sends the message to the authority with help of GPS and GSM. The authority get the message on the application.

5. Conclusions

We develop a such type system which is cost effective and accuracy is also good . The prototype of testing vehicle can efficiently detect crack and obstacles on the railway track. In this system we use a GSM and GPS technology so if any failure is occurs on the track a alert massage is send to the authority. And environmental condition does not affect our proposed system. The accurate data helps in preventing data helps in preventing the accidents. The main aim to protect the people from

accidents and also reduce the man power. When the prototype is industrialized it will definitely helpful for Indian railway. The result shows that this new technology will increase the reliability of the Indian railway. This makes Indian railways more competitive with other countries rail system.

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