A REVIEW ON TRAIN TRACK CRACK DETECTION AND ACCIDENT AVOIDANCE SYSTEM USING IOT

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ABSTRACT

The Indian Railways has one in all the most important railway networks in the international, criss- crossing over 1,15,000 km in distance, throughout India. In india so many transport facilities are available. In which railway played vital role to transport of Indian population. The Indian population is on second position in world. So, transportation problem is reduced because of Indian railways. The Railway Safety Management Centre analyses the defect information and provides an alert to the next approaching train. The train derailment can be avoided and chance of loss of human life and economy can be minimized. Rail transport in India is at the forefront of providing the transport infrastructure wanted to meet the desires a quickly expanding economy. Manual detection of tracks is bulky and now not fully powerful because of a whole lot time consumption and requirement of skilled technicians. This mission work is aimed toward addressing the difficulty by means of growing an automated railway song crack detection gadget. With the proliferation of net of factors (IoT).

Keywords- criss -crossing, vital, forefront, ,infrastructure, proliferation, IOT.

I.   INTRODUCTION

India is big country in which millions of people live. Transport has played very good role in growing the economics condition of country. The Indian railway network today has a track length of 113,617 KM over a route of 63,974 KM and 7,083 stations.For millions of people across the world railways are the prime mode of transportation. Safety is one of the key issues for railway transportation. Due to the heavy duty of the train transportations, train accidents happen every year in the world, and results in serious destruction of property and injury or death of passengers and crew members. To avoid this problem in this project. To provide protection from rail damage due to cracks occurring in the track. The IoT module will specify the exact location to which the message will be sent to the authorities. live feeds and data from the IoT module will be updated on the meant use of the wireless device. through using this technology, we will be able to prevent the loss of valuable existence or property.

II.   PROBLEM STATEMENT

The foremost hassle has been the lack of cheap and green generation to hit upon problems inside the rail tracks and of path, the lack of proper preservation of rails that have resulted in the formation of cracks in the rails and other similar problems because of delinquent elements which jeopardize the security of operation of rail transport. in the past, this hassle has cause a number of derailments resulting in a heavy lack of lifestyles and assets. Cracks in rails had been identified to be the main purpose of derailments in the beyond, yet there were no reasonably-priced automated answers to be had for checking out functions.

- To offer safety in journeying of trains, a device detects fault in music .
- To design gadget which provide detection according to railway track with the assist of IR sensor.
- For smooth operation consisting of indication of crack side we're using buzzer.
- To update information on website the use of IOT.

Figure 1. Railway Track Crack

III.   EXISTING SYSTEM

Finding cracks in rails is time consuming because of manual inspection. This additionally reduces accuracy. This design approach has limits on intelligence.

IV.   PROPOSED SYSTEM

This device includes designing a crack finder robot to discover cracks within the rails. The system uses a controller to interface with the robot automobile and crack detection sensors. The detector detects voltage versions of the crack sensor, then transmits the signal to the microcontroller. The microcontroller exams for voltage versions between the measured value and the edge value and drive the robotic according to it. The robotic model is interfaced with the microcontroller using the SPDT relay and driving force IC. If a crack takes place inside the song, the robotic could be stopped, then an alarm might be caused, and the LCD will display a fault detection message. The IOT module can even ship information over the net or the control room. This assignment use Arduino uno controller, crack sensor, IOT module, LCD display, buzzer, 5V, 750mA adjustable energy supply. The three-terminal voltageregulator 7805 is used to alter the voltage. The bridge kind complete-wave rectifier is used to rectify the secondary AC output of the 230/18V step-down transformer.

V.   OBJECTIVE

Major objective discover gaps in the railway line and to decide whether there are any accidents on the tracks in order to avoidentity and prevent accidents. This type of model provides an ultrasonic sensor and IR sensor joint that responds to the precise position of the faulty track, as well as transmitting information to the IOT control room, so that a big apple incidents can be closed.

VI.   LITERATURE REVIEW

In this paper Sunghyuk Park, We offer a platform tracking manage machine that makes use of image processing technology to make certain the safety of passengers in the station. The proposed device video display units nearly the complete period of the music inside the platform the usage of more than one cameras and determines in real time whether or not there are humans or dangerous barriers in the defined monitoring place. boost using photograph processing technology.

VII.   BLOCK DIAGRAM
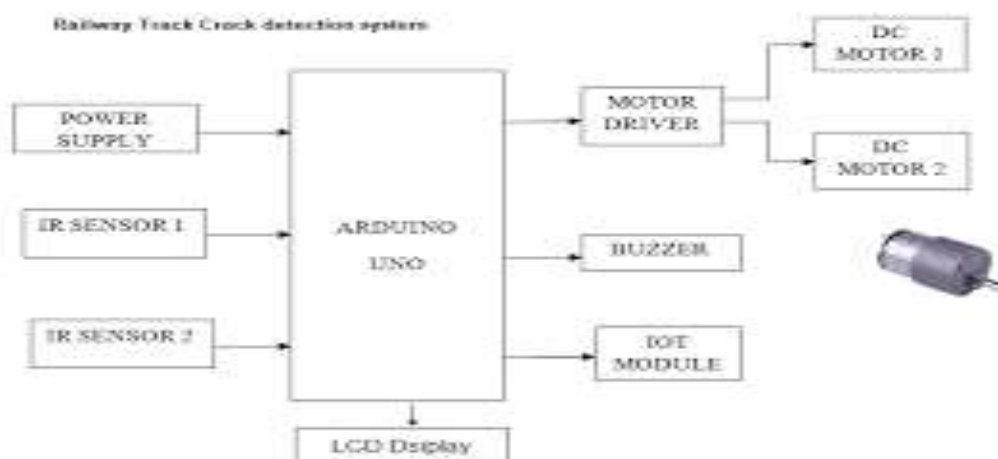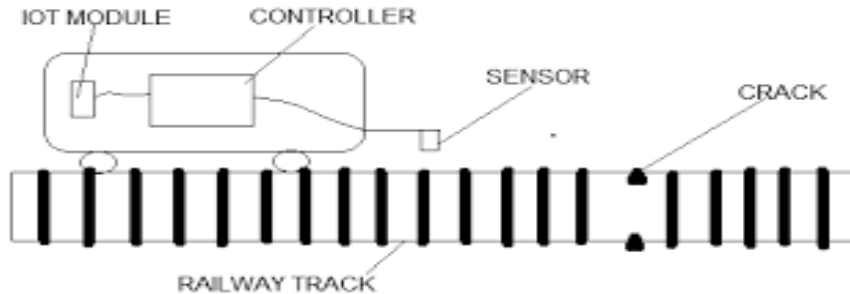
VIII.   WORKING

An arduino board is included into the model, which serves as an interface between IR sensors, passive IR sensors and the IOT. The whole device is incorporated on a four-wheeled IoT robot/vehicle that movements between educate tracks. The robot is programmed to transport ahead with an infrared sensor connected to the left, proper and ahead to hit upon barriers. which detects breaks inside the track. Arduino is programmed with Arduino IDE and it's far connected with some devices like motor motive force had to circulate our robotic ahead and backward, IOT module to ship message to the engine higher stage attitude, infrared sensor for detecting cracks, In our project, there are two set of IR sensor units fitted to the two sides of the railway model. This unit is used to activate/deactivate IOT module unit when there is any cracks in the track. The IR transmitter and IR receiver circuit is used to sense the cracks. It is fixed to the front sides of the vehicle with a suitable arrangement. When the car is turned on, it goes on the model track. IR sensors monitor the condition of the tracks. In normal engine mode, serial transmission is in the first stage.. We recent updation of project we used ultrasonic sensor , to protect from anti-collision. With this technique we prevent from accident. We also added renewable energy source for

IX.   COMPONENTS REQUIREMENT

* Arduino uno
* Crack detection sensor (IR Sensor)
* Ultrasonic Sensor
* LCD Display
* Motor driver
* Dc motor
* Buzzer
* Relay Board
* IOT module
* GPS Module
* Railway and track Mechanism
* Battery
* Solar Panel
* SMPS
* Others

X.   RESULT AND DISCUSSION

The sensors sense the crack and send the informationto the IOT, where it responds and gives the command to the particular component withpredefined algorithm, the time parameters are crucial and modified usingIOT.Thus, this device would help to which can be easily changed reduce the train collisions. In order to detect thecurrent location of the device in case of detection of a crack, a GPS receiver whose function is to receive thecurrent latitude and longitude data is used. To communicate the received information, a GSM modem has been utilized. The function of the GSM module being used is to send the current latitude and longitude data to the relevant authority and SMS.

XI. ADVANTAGE

- Enormously green and person friendly design.
- Easy to apply.
- Low strength intake.
- Vicinity of the automobile can be known using GPS
- To stumble on the crack the usage of IR obstacle sensors
- GPS and GSM based tracking information sending SMS
- Layout effectively.
- Works worldwide (GSM availability).

XII. APPLICATION

It is used in railway departments to reduce the accidents.

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