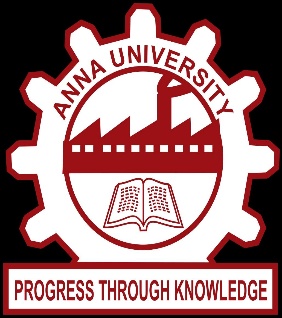
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**Smart solution on Railways systems**

**using IoT**

**Literature survey**

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**LITERATURE SURVEY**

**1)**

**Paper Title** : A Smart Railway Track Fault Detection Using IOT

**Authors** : Vatsala Sharma,Kamal Nayanam,Himani.

**Publication** : IOSRJEN, August 2021, Volume:11, Issue:08

**Methodology** : Using Raspberry pi,Ultrasonic Sensor,IOT.

**Abstract** : The proposed system introduces technology, to prevent railway accident. An Ultrasonic sensor is installed that monitors the track and provides status to the Raspberry pi controller. If any crack is detected it immediately sends the cloud crunch to the user's mobile phone. The project uses a stepper motor assembly in which the ultrasonic sensor is attached and the ultrasonic sensor moves to the side of the track and in case of error anywhere the track receives and provides information to the railway department. If there is any fault detected on the track, the ultrasonic sensor attached to the system will send out ultrasonic waves and indicates the distance which is less than the preset distance and indicates a fault in track and the fault information to monitor screen of the railway department. This project is very helpful in preventing accidents and provides information before the railway department about the cracks so they can get information about the cracks and can be fixed soon.

**Components**  : It consists of Power supply, Stepper Motor, Raspberry Pi, Ultrasonic Sensor, Buzzer and LCD display and the output is given to Cloud server.

**Advantages** :

Accidents occurring in Railway transportation system cost a large number of lives. So this system helps us to prevent accidents and giving information about faults or cracks in advance to railway authorities. So that they can fix them and accidents cases becomes less.

This project is cost effective. By using more techniques they can be modified and developed according to their applications

**Disadvantages** :

The ultrasonic Sensor has limited range. Temperature Fluctuation affects the speed of an ultrasonic sensors pulse or sound waves.Eventhough the target has not likely moved or shifted, it will appear that the target is closer due to the increase in temperature, thus we don’t get accurate results.

2)

**Paper Title**  : Automation of railway gate Using IOT

**Authors** : M. Abinaya , Vidya , Thenmozhi

**Publication** : IJERT (ISSN: 2278-0181)

**Methodology** : Using Raspberry pi, IR Sensor, IOT.

**Abstract** : The railway system in India and other countries is the most commonly used transportation mode and it is also a one of the low cost transportation mode. At present, country like India is having world’s largest railway network in the world. There are thousands of rails running on track every day. In railway system, it is impossible to stop some of the critical situations or emergencies which are arising during the running of train. The RFID reader read the ID of train, information related to train means date, time, train RFID number are send to central server through internet. Central server receives the information from pi, immediately it will fetch all phone numbers registered to train based on RFID number and send the notification message to all phone numbers. An IR proximity sensor detects the presence of train/object without any physical contact. The proposed system consists of 2 LEDs- red and yellow. When the train arrives red LED will glow and when the train departures yellow LED will glow.

**Components** : It consists of IR sensors, actuators , LED Raspberry pi and RFID devices

**Advantages** : Automatic gate control system using IoT is an effective and

advanced method to reduce the occurrence of railway accidents. This system provides the lot of benefits to the road users and railway management

**Disadvantages** : Data transfer speed is slow in Infra red and to establish a entire network initialization cost is high.

3)

**Paper Title** : Design and Simulation of a PLC and IoT-based Railway Level Crossing Gate Control and Track Monitoring System using LOGO

**Authors** : Muhibul Haque Bhuyan, Sheikh Md. Mamunur Rahman, Md. Tofayel Tarek

**Publication** : (IOSR-JEEE) Volume 17, Issue 2 (Mar. – Apr. 2022))

**Abstract**  : Using LOGO software with the PLC, IR sensors, GUI & IOT.

In this paper, the main concern is to design a PLC and an IoT-based automatic interlocking system to protect trains from accidents or clashes and ensure the safety and security of the passengers. Therefore a model has been designed using LOGO software with the PLC as the main heart of the control system. The ladder logic program for PLC was developed using LOGO software on a personal computer and then downloaded into the PLC. For communication between the PLC and computer, an RS485 serial port was used. To detect the presence of a train on the track, ultrasonic and radio frequency (RF) transducers and infrared (IR) sensors were used as both the transmitters and receivers. The system was simulated using LOGO software. In the system, we have incorporated Internet of Things (IoT) and Visual Basic Programming software to connect it with the mobile Apps and create Graphic User Interface (GUI) respectively. When the train passes out from the level crossing gate then the end side’s second sensor gets HIGH and gives a signal to the PLC by which the PLC Sends the signal to open up the barriers and then the signals come in their normal positions

**Components** : Power supply 5V DC (LM7805), power supply 24V DC (LM7824), PLC, Buzzer, DC motor, OLED Display, ultrasonic sensor, RF Tx-Rx, IR Tx-Rx, Mobile apps

**Advantages** : This method would automate our system, reduce the manpower requirements, the manual operation would be replaced, and hence it would be cost-effective as well.

**Disadvantages** : These efforts are still under exploration stage, especially in Bangladesh and have not been practically implemented so far.

4)

**Paper Title** : Analysis of smart railway gate control

**Authors** : I.Lakshmi , Maria Viji

**Publication** : (SSRG - IJCSE) - Volume 6 Issue 2

**Methodology** : Using Adruino , IR Sensor, IOT.

**Abstract** : The main aim of this paper represents a model for ARGC (Automatic railway gate control) using Arduino UNO R3. In the existing model has a serious disadvantage that is it cannot only detect train but also other objects (like animals, human) and it doesn’t deal with the trespassers who are already into the gate. The proposed model overcomes the inaccurate identifying of objects and also manages the trespassers who are already into the gate. The ultrasonic sensor placed at the front of the train will sense for the obstacle on the track. At the beginning, the IR sensor1 senses for the detection of arriving train and the output of sensor goes HIGH, that is when the sensor1 senses the train.The output of the ultrasonic sensor goes HIGH when the obstacle is detected, the train will be stopped and the message of obstacle will be sent to the nearby railway station so that it can be cleared.

**Components** : Ultrasonic Sensor, IR sensors , Motor driver L293d , Arduino UNO R3, and IR LEDS.

**Advantages** : Smart automatic railway gate control system provides a best and the safest way of transportation for not only passengers inside the train but also for the trespassers in and around.

The main advantage of this system is its cost effectiveness as it can be used in all countries independent of what area it can be.

**Disadvantages** :

The adruino board is a delicate device , so it has to be handled carefully and IR sensor range is limited.

5)

**Paper Title**  : IOT Based Fault Control in Railway Track System

**Authors** : Bagyalakshmi.N , Oviya .N

**Publication** : (IJAREEIE) Volume 8, Special Issue 1, March 2019

**Methodology** : Using Adruino , ATmega328P Microcontroller

**Abstract** : This project concern to a process for monitoring the condition of train tracks and more specifically has the object of the identification of defects When the supply is given to the device, the DC motor gets start through relay driver circuit. Two IR sensors are fixed in front of the train which is used to find out the crack on the track. Each sensor will produce the signal related to the position with the rail. If the track position is normal both the sensor gives the constant sensed output. If any sensor misses their output condition to fail then there is defect on that side. The sensor will inform this by giving alarm and sends information to the smart phone android app in IOT based via GPRS MODEM. The generator converts mechanical energy into electrical power which can be used for external circuit. The generator will generate the energy and recharge the battery while the motor starts running. The battery provides a static potential power or electrical charges to other devices. A liquid crystal display (LCD) displays the detected output, Ultrasonic sensor is used to detect the obstacle in the track if any obstacle detected means the Arduino automatically transmits the message to nearby station via IOT using GPRS MODEM

**Components** : IR sensors , GPS , and LCD

**Advantages** : This project presents the implementation results of the railway track crack control system using simple components

This is cost effective railway track crack detection

system with greater accuracy and High speed information transferring after crack detection.

**Disadvantages** : Adruino board have to be handled carefully