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AUTOMATIC RAILWAY GATE CONTROL AND ANIMAL DETECTION SYSTEM

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Abstract – *The automation of railway crossing gates are used to avoid the accident near to it. At present, railway crossing gates are operated only in manually. Involvement of humans and manpower will be reduced. Traffic jam will be totally avoided by this method, the arrival and departure will be calculated by the device. Then any disturbance through the railway track will be intimate. The gates are lifting and shutting by the motor by the intimation of sensors. The detection is occur, the total process is done by under the control of arduino.*

Key Words: **Arduino, IR sensor, relay, WIFI module, UV sensor, Piezo buzzer.**

INTRODUCTION

Railways are one of the most common used modes of transport in India. Error free railway in India is very rare in the human negligence and miscommunication which causes many accidents and delay in train. The railway gates are opened and closed are required human effort and there is so many mistakes and accidents occurred. To avoid these situations, we may use system work of arduino and sensors. Some of the main challenge for railway department is to avoid accidents near to the railway gate. Now a days, the gate operations are manpower by the signal intimation. Sometimes it to be gone wrong, to aviod this category, we use arduino and sensor programming control gates instead of human work. There is many times of security given then the normal human method.

IMPLEMENTATION

There is implement of arduino microcontroller, IR {tx,rx}, node MCU, relay driver, motor, 16*2 lcd display, UV sensor, WIFI module, motor, piezo buzzer and finally power supply. The IR sensors are connected to the transistors respectively.

WORKING

The transformer is fixed to receive the power supply and send it to the distributor which distributes power to other devices. Arduino is operate the other devices which are sensors, motor and buzzer by the programming code of arduino. When the train crossing first IR sensor, the LCD shows the train is near and gate is closing. Then the train passes away, the second IR sensor senses and now the LCD shows the train is exit and the gate is opening. These all process are intimate by the signals or lights. In-case of any animals are in the truck it should be detect by the UV sensor fixed on the exact manner. It detects any obstacles the buzzer will be blow.

The opening and closing of gates can seen by any places with the internet. The working process of motor railway gate should be recorded and filed. The WIFI module is used to transmit the result of gates by some arduino programming.

SENSORS

The sensors are used to senses the train and obstacles like animals in the track.

1. Infrared sensor [IR]
2. Ultraviolet sensor [UV]

They can control by the arduino microcontroller.

IR SENSOR

Infrared radiation (IR) is electromagnetic radiation with a wavelength 0.7 and 300 micrometers , which equates to a frequency range between approximately 1 and 430 THZ.

Its wavelength is longer and the frequency lower than that of visible light, but the wavelength is shorter and the frequency higher than that of terahertz radiation microwaves .Bright sunlight provides an about 1 kilowatt per square meter at sea level. This IR sensors are used to identify the objects which may disturb or crossing, it can intimate through respective manner. There is need of two sensors which one is used to opening and another one is used to closing the gates. These two sensors are fixed in the two sides of the gates respectively to the opening and closing of the gates.

UV SENSOR

Ultrasonic sensors are devices that use electrical mechanical energy transformation, the mechanical energy is in the form of ultrasonic waves, to measure distance from the sensor to the target object or any obstacles. Ultrasonic waves are longitudinal mechanical waves which travel through compressions and rarefactions along the direction of wave propagation through the medium. Any sound wave above the human auditory range of 20,000 hz is called ultrasound.

PIEZO BUZZER

The piezo buzzer is used to identify the objects or any obstacles in the railway track which is done by the control of arduino, senses with the help of UV sensor.

WIFI MODULE

Arduino need internet to establish the results of opening and closing gates, so the WIFI module is used to receive the wifi signal from the external devices.

features

- Open source
- interactive
- programmable
- low cost
- simple
- smart
- wifi enabled

Fig 1- wifi module

BLOCK DIAGRAM

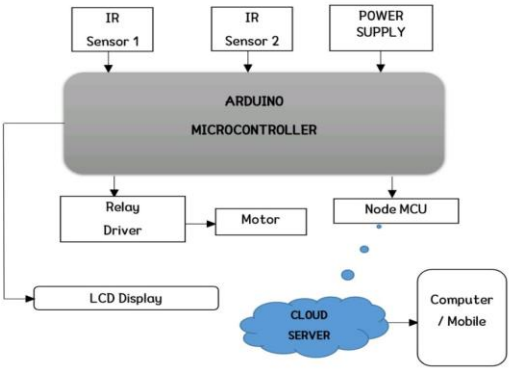

Fig -2: Block Diagram

SOFTWARE REQIREMENTS

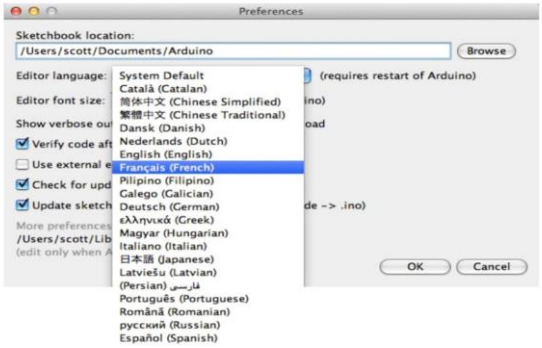

Fig -3: program preference

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage (recommended)	7-9V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328) (0.5 KB used by bootloader)
SRAM	2 KB (ATmega328)
EEPROM	1 KB (ATmega328)
Clock Speed	16 MHz

Fig -4: table (communication)

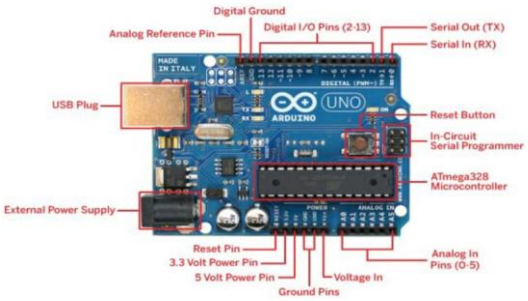

Fig -5: arduino board

CONCLUSIONS

In this work, an easy work of railway crossing system is proposed based internet of things. Here, developed a prototype for this and successfully verified the opening and closing gate during train arrival and watching or sensing the railway tracks from the animal and other obstacles to the railway track. The goals which are achieved by this project, 1.Less human involvement, 2.Efficient management of railway gates, 3.cost effective, 4.easy construction of sensor on track, 5.reduce error by the humans, 6.protable and flexible for enhancement.

This is very helpful to the people living in the croweded areas with unmanned railway gates

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