GOVERNMENT COLLEGE OF TECHNOLOGY
DEPARTMENT OF ECE
TECHTALK-24

“NEXT-GEN ZERO”

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ABSTRACT :

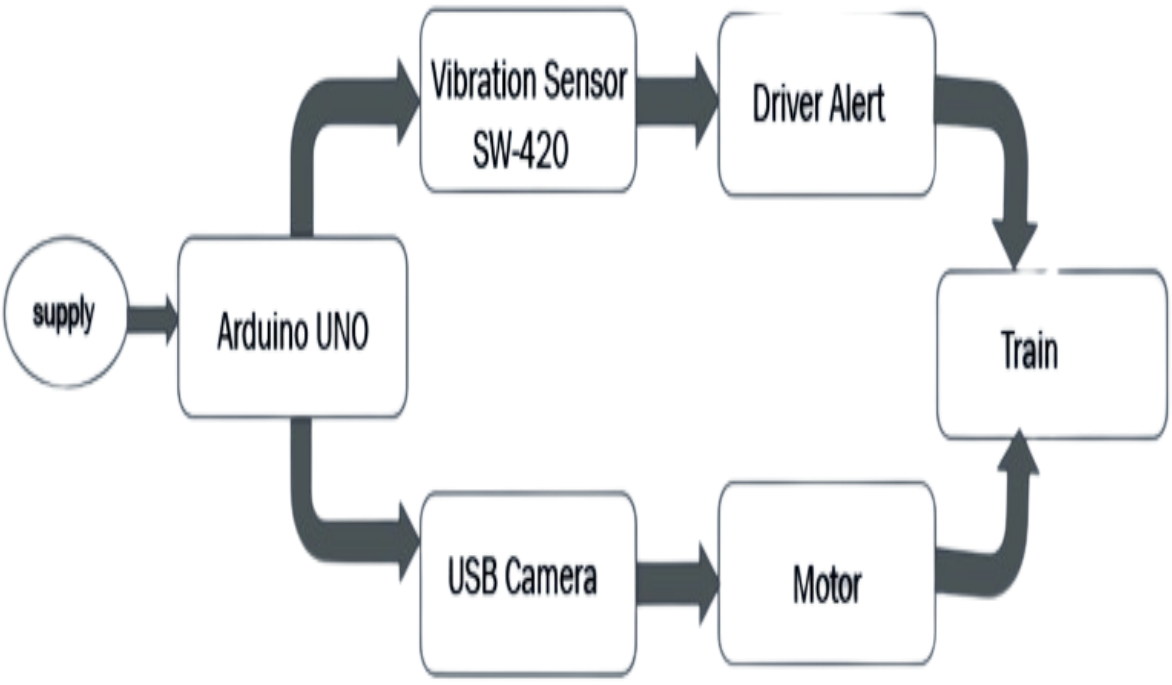
In recent days,we have come across the Popular NEWS The train accident which occurred in,Balasore odissa on June 2023.The signal error led to the devasating triple train accident which resulted in more than 293 deaths and 1000 injuries.The goods train lag of KAVACH an Indian train collision avoidance system(TCAP).

So in the worst case of the trains coming in the single track,We have equipped an additional feature in which vibration sensors detects the uniform vibrations of the arrival of train.It transmits the signals through the protocols and it was received by the nearby trains as an alert and it automatically shuts the train engine slowly.The image processing we done here detects the human,animal,train in the track.If train,emergency buzzer is activated.Else air blower is enabled and it pushes away from the track.

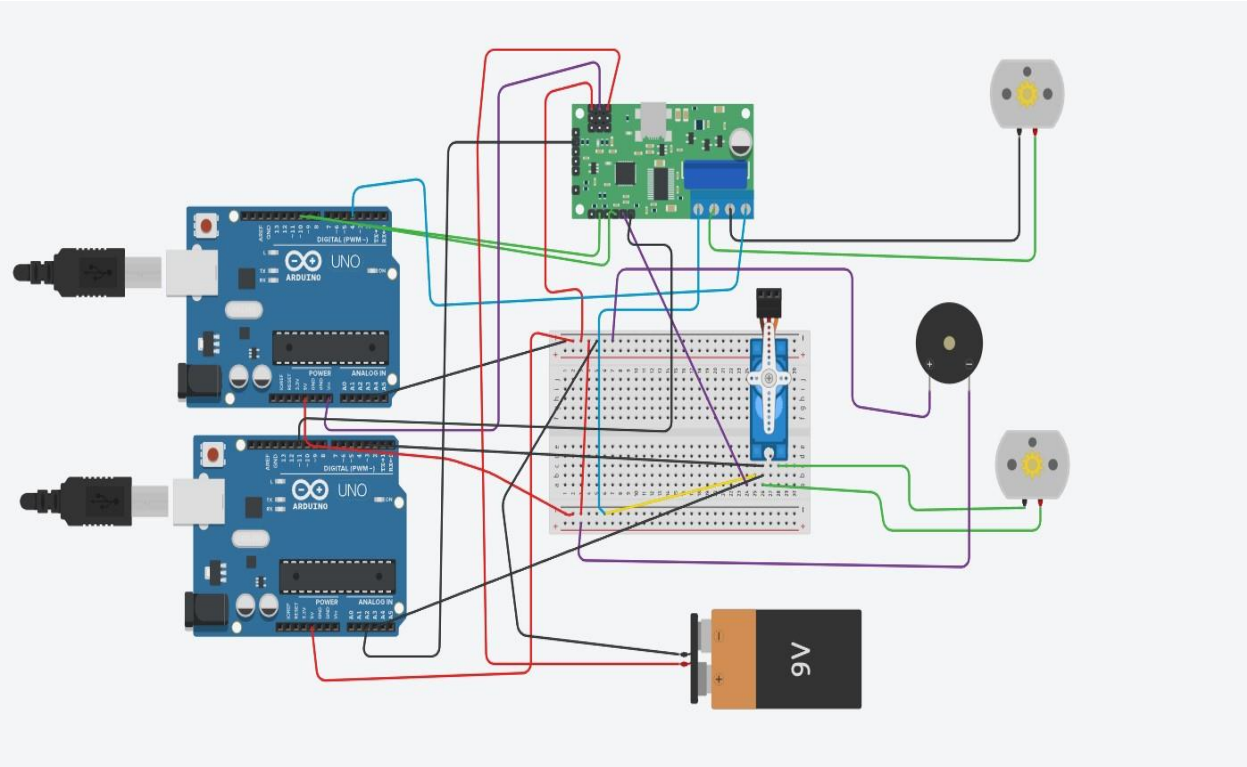
COMPONENTS USED :

1) Arduino UNO and MEGA
2) SW-420 vibration sensor
3) DC motors – 2
4) Solderless breadboard
5) Motor Driver- 2
6) Jumper cables

BLOCK DIAGRAM:



CIRCUIT DIAGRAM :



ARDUINO CODE :

```
#include<Servo.h>

Servo servo1;

Int motor = 8;

Int vs =7;

Void setup(){

  Servo1.attach(8);

  pinMode(motor, OUTPUT);

  pinMode(vs, INPUT);

  servo1.write(0);

  Serial.begin(9600);
```

```
}
Void loop(){
  Long measurement =vibration();
  Delay(50);
  Serial.println(measurement);
  If (measurement > 50){
    //digitalWrite(motor, LOW);
    Servo1.write(90);
    Delay(5000);
  }
  Else{
    //digitalWrite(motor, HIGH);
    Servo1.write(0);
  }
}
Long vibration(){
  Long measurement=pulseIn (vs, HIGH);
  Return measurement;
}
```

COMPONENT DESCRIPTION :

a) Arduino UNO:

An Open source microcontroller board based on the microchip ATmega328p microcontroller.The board is equipped with sets of digital and analog I/O pins that may be interfaced to various expansion boards and other circuits.There are 6PWM(Pulse Width Modulation)pins among the 14 digital pins.

b) L293D:

L293D is a dual H-bridge motor driver integrated circuit(IC).Motor drivers act as a current amplifiers since they take a low-current control signal & provide higher-current signal.

c) Vibration sensor:

A SW-420 vibration switch is a device that has a spring and a rod inside a tube.When the switch is exposed to vibration,the spring touches the rod and closes the circuit.

d) Servo motor:

The TowerPro SG90 9g mini servo is a 180` rotation servo.It is a digital servo motor that receives and processes PWM signal faster and better.

APPLICATIONS :

- It can act as a additional feature to KAVACH an Indian train collision avoidance systems
- Airblower prevents many suicides ,animals death crossing the rail track and also the vehicles stuck in it

IMAGE PROCESSING:

Camera was installed in front of the train.It detects and classifies the images of human,animals,vehicles by analyzing their model ,structure and movement.Based on this the DC motor which is used as an airblower is speed controlled and varies respectively.It is

located at an angle approximately 68’ degree to the right.

CONCLUSION :

Hence this Next-gen Zero we have implemented using Arduino was designed successfully. It will help in avoiding the trains direct-direct collisons in an less expensive manner in addition to KAVACH.