

AI-BASED RUSH COLLISION PREVENTION OF CIVIC SEGMENTS

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Abstract:

This study substantially arranges for the reduction of those swarms with resolve. Moreover, by presenting them at the path station, you will be able to look at afterward them. An ingenious controller framework with a methodology those indications supplied by the global positioning system Eventually, Tom is rummaging through the preparation for those transmitters. The number is processed using an evolutionary method. We have a large number of individuals in the station, which is the project's heart. Can achieve the goal of keeping the audience together and Reducing the likelihood of a stampede in a certain station by modifying the arrival time frame and location of a train that stops at a specified location One of the solutions is this project. Elphinstone Station's trampling disaster has been presented as a possible solution. Mumbai is a city in India.

Keywords— Rail Tracking, Artificial Intelligence, GPS, Neuro-Fuzzy, GSM, Signalling

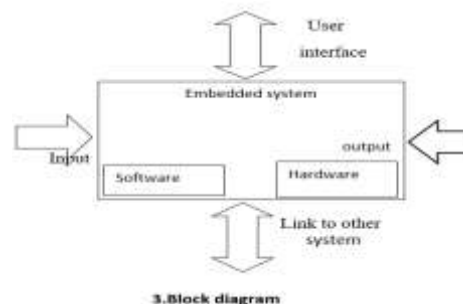
1.Introduction

Railway monitoring has received a lot of attention in countries and regions like the United States, Russia, China, and India. In recent years, traffic density has become a major issue all around the world. This is not uncommon in the railway industry. The terms "train accident" and "station crowding" are widely used to describe

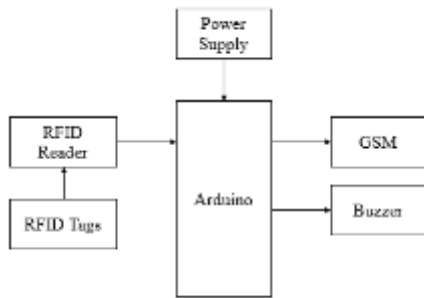
events that significantly impact human life and time. This paper, enthusiastic about the subject, proposes a solution to this important problem. There are now multi-faceted colour light signals, relay interlocking, distinct block operations, point operations, train tracks, and microwave radio. The railway system intends to use a monitoring strategy to keep the train in a state before arriving at the station. The study scope of this component is extremely vast.

2.Embedded system implementation

An embedded system is a type of computer system that is primarily designed to execute activities such as data access, processing, storage, and control in various electronics-based devices. Embedded systems are made up of hardware and software, with the software being called firmware and being embedded inside the hardware. One of the most important features of these systems is that they provide the o/p within time constraints. Embedded systems contribute to making tasks more accurate and convenient.



3.Block diagram



3.1.Arduino



With a USB port, 14 digital I/O pins, 6 analog pins, and an Atmega328 microprocessor, the Arduino Uno is a very useful addition to the electronics world. It also has to transmit and receive pins for serial connection. There are several other Arduino boards on the market, such as the Arduino Uno, Arduino Due, Arduino Leonardo, and Arduino Mega, however, the Arduino Uno and Arduino Mega are the most popular. If you want to do a project involving digital electronics, embedded systems, robotics, or the Internet of Things, the Arduino Uno is the best, easiest, and most cost-effective alternative.

3.2.RC522 Reader



The RC522 is a 13.56MHz RFID module based on the NXP semiconductors MFRC522 controller. The module supports I2C, SPI, and UART, and comes with an

RFID card and a key fob by default. It's often used in attendance systems and other applications that need to identify people or objects.

3.3.GSM



GSM, which stands for "global system for mobile communication," is a type of mobile modem (GSM). Bell Laboratories created the GSM concept in 1970.

```

long duration, distance;
digitalWrite(trigPin, LOW);
delayMicroseconds(1000);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
distance = duration * 0.034 / 2;
Serial.print("ULTRA:");
Serial.print(distance);
Serial.println(" cm");
// delay(500);
  
```

```

lora.println("A");
Serial.println(loc);
if(distance<30){
  Serial.println("Obstacle Sending
alert....");
  lora.println("O:"+loc);
  digitalWrite(5,LOW);
}
else{
  lora.println("X:"+loc);
  digitalWrite(5,HIGH);
}
delay(1000);
  
```

```

lora.println("B");
if(lora.available()){
  rcv = lora.readStringUntil('\n');
  Serial.println("Received: "+rcv);
  if(rcv.indexOf("A")!= -1){
    int t=millis();
    if(lora.available()){

```



```

    rcv = lora.readStringUntil('\n');
    Serial.println("Received2: "+rcv);
    if(rcv.indexOf("O")!= -1){
      Serial.println("Obstacle motor off");
      digitalWrite(5,LOW);

```

In the entire world, it is a widely utilized mobile communication system. For mobile voice and data services operating at 850MHz, 900MHz, 1800MHz, and 1900MHz frequency bands, GSM is a digital, open cellular technology.

The time division multiple access (TDMA) approach was used to establish the GSM system as a digital mechanism for communication.

```

if(lora.available()){
  rcv = lora.readStringUntil('\n');
  Serial.println("Received1: "+rcv);
  String lati =
  getStringPartByNr(rcv,':',1);
  String lon
  =getStringPartByNr(rcv,':',2);
  Serial.println(lati);
  Serial.println(lon);
  double la=lati.toDouble();
  double lo=lon.toDouble();
  Serial.println(la);
  Serial.println(lo);

```

The data is first reduced and digitalized by a GSM before being sent across a channel with two distinct streams of client data, each in its own specific time slot. The digital system may transmit data at rates ranging from 64 kbps to 120 Mbps.

3.4.LCD

The term liquid crystal display is referred to by its acronym, LCD. A variety of circuits and gadgets, including mobile phones, calculators, computers, televisions, and so on, use this type of electronic display module. Multi-segment light emitting diodes and seven-segment displays are the most popular.

The main benefits of using this module are its low cost, ease of programming, animations, and the lack of limitations on presenting unusual and even unique animations, characters, and other content.

3.5. Buzzer

A mechanical, electromechanical, or piezoelectric audio signaling device is a buzzer or beeper. Alarm clocks, timers, and confirmation of human input such as a mouse click or keyboard are all common uses for buzzers and beepers. Buzzers are electronic transducers with a DC power source that are commonly used in sound devices such as computers, printers, copiers, alarms, electronic toys, automobile electronic equipment, telephones, timers, and other electronic products.

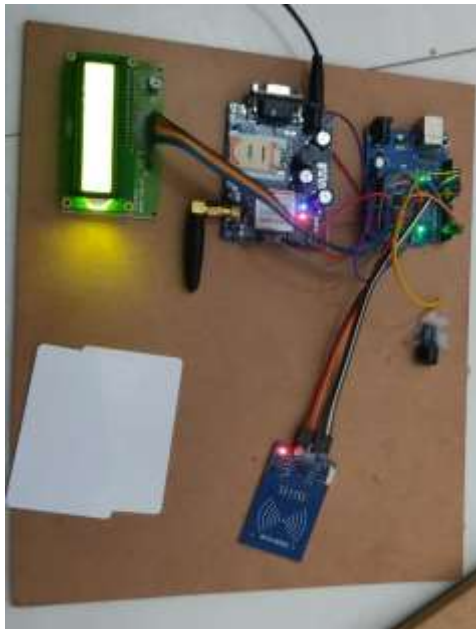
This section dedicated sensor expansion module and the board in combination can complete a simple circuit design, to "plug and play." 5V active buzzer Rated power may be instantly attached to an

ongoing sound, and this section's specific sensor expansion module and the board work together to complete a straightforward circuit design.

4. Result and Conclusion



The proposed system, which includes GSM modules and simulated annealing, can help the train division protect people from accidents. Only at the signal post, the position of the signal and its current status is relayed straight to the rail and may be seen on the computer. In the future, this design could be used in automation tactics.



Real-time train track data, including speed and current position, may be tracked and controlled at the control station. Such real-time data could be used for system modifications to minimize incidents related to natural disasters like ground slides and

cyclones. Additional geographical sensors and geographic data interfaces may be required, as well as cloud providers to improve data access dependability. Furthermore, analysing such data is certain to provide a much better understanding of why such instances occur. The method will benefit greatly from the knowledge gained from such a study, which will be improved over time as more data is obtained and learned.

6. References

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