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TITLE :

“Automated Rail Crossing System”

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ABSTRACT :

This microprocessor project automates railroad crossings using sensors to detect approaching trains. The system activates warning signals and lowers crossing gates in real-time, ensuring timely and safe responses to train movements.

KEYTERMS :

Microprocessor, Railroad Crossing Automation, Arduino uno, Sensors, Warning Signals, Crossing Gates, Advanced Algorithms, Safety, Efficiency.

INTRODUCTION (BACKGROUND AND STATEMENT OF THE PROBLEMS):

Traditional railroad crossings face safety and efficiency challenges with manual control. This project addresses these issues by proposing a microprocessor-driven automation system using sensors to detect trains and initiate timely responses.

RELATED WORK :

In Bangladesh, Railway Crossing stations are handmade used by the railway operator. the operator is responsible for using the gates according to arrival and departure of the train. At arrival and departure of the Train, once travel details are sent to the gate operator via communication tools. The current system is very error prone which tends to more accidents at the railway level crossing.

PROPOSED SOLUTION :

We will install sensors at certain distances on both sides of the rail crossing. I will lock the gate as soon as I get the signal from the first sensor. And the alarm will sound as well. As soon as the second sensor receives the signal, the gate will open.

AIM AND OBJECTIVES OF THE PROPOSED SOLUTION :

In Bangladesh every year more people died by accident in rail crossing . So our aim is to reduce the accident rate .

HARDWARE REQUIREMENTS :

Hardware components include an 8086 microprocessor, sensors (e.g., infrared detectors or magnetic field sensors), warning signal devices, motorized crossing gates, and associated interfacing hardware.

SOFTWARE REQUIREMENTS :

Arduino programming is essential for real-time control, communication, and coordination with the 8086 microprocessor. The software will encompass algorithms for data analysis, decision-making, and interfacing with the hardware components.

COST ESTIMATION :

8086 Micro Processor	= 500 tk (1 piece),
Toy Train	= 250-500 tk (1 piece) ,
Arduino Uno R3	= 900-1000 tk (1 piece),
IR Sensor	= 150-200 tk (6-7 piece),
Buzzer	= 100-150 tk (2 piece),
Servo Motor	= 500-700 tk (2-3 piece),
White Tape	= 50-60 tk (2 piece),
Knife	= 100-150 tk (1 piece),
Scissor	= 80-120 tk (1 piece)
TOTAL	= Around 3000 tk

WORK PLAN FOR THE PROPOSED STUDY WITH TIMEFRAME :

The project timeline involves phases such as sensor integration, algorithm development for the 8086 and Arduino, hardware assembly, software programming, testing, and implementation. A detailed work plan outlines tasks and milestones over a specified timeframe.

CONCLUSION :

The automatic rail crossing system is an effective and best solution to the problems that occur in a system used by Bangladeshi trains. This program offers superior benefits to road and railway uses managers. This program minimizes the risks involved occurs at intersections. As this the system does not require any human resources at all made in any remote and rural areas there is

no railway guard. The proposed system is used servo motors to lift the gates and these are very reliable and accurate to raise or lower the gate with specified angle rotation. Finally we will conclude that the proposed system will have high, reliability performance and lower cost compared to existing ones currently in use.

REFERENCES :

1. Karthik Krishnamurthy Monica Bobby, Vidya V And Edwin Baby (2015) “Sensors based automatic railway gate”

2. https://www.youtube.com/watch?v=pypuZWZNnAo

List of scholarly articles, publications, and relevant sources that informed the development of the proposed 8086-Arduino solution.