AUTOMATIC RAILWAY CROSSING GATE CONTROL

A Project submitted in partial fulfillment of the requirements for the Award of Degree of Bachelor of Science in Electrical and Electronic Engineering

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Certification

This is to confirm that this venture named **"automatic Railway Crossing Gate Control"** is finished by the accompanying understudy under my immediate management and this work has been done by them in the research facilities of the Department of Electrical and Electronic Engineering under the Faculty of Engineering of Daffodil International University in incomplete satisfaction of the prerequisites for the level of Bachelor of Science in Electrical and Electronic Engineering. The introduction of the work was held on December 2019.
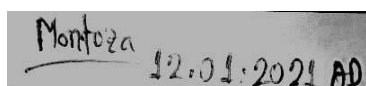
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DECLARATION

The venture named **"Automatic Railway Crossing Gate Control"** presented by Name: **Mosharof hossain**, ID: 162-33-3520, Session: Summer-2016 and **jyatirmoy das**, ID: 163-33-3649 Session: Fall-2016 has been acknowledged as agreeable in incomplete satisfaction of the necessities for the level of **Bachelor of Science in Electrical and Electronic Engineering** on April 2020.

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ABSTRACT

In this venture, a miniature regulator is utilized to control the entryway in rail flagging. The sign is shipped off the miniature regulator by the two IR sensors to consequently open and close the rail crossing entryway, at that point the miniature regulator imparts the sign back to the servo engine. This servo motor opens and close the crossing point entryway thus. Train hailing is compelled by two IR sensors. They are named by IR-sensor-IN and IR-sensor-EXIT. Right when the train encounters the IR-sensor-IN, the convergence portal will thus close and a red light glimmers with a notification alert. Again, when the train ignore the IR-sensor- EXIT, by then the red light with the notification alert therefore slaughters and the convergence entryway will open normally and the green light will turn on thus.

CHAPTER 1

INTRODUCTION

1.1   Introduction

The undertaking is a programmed railroad crossing framework made with an Arduino star smaller than expected and IR sensor and a couple of different components. The principle point of the undertaking is to recognize the presence of a train on the rail line and control the intersection entryway. The working of the undertaking begins with the IR sensor that detects the coming up train on the rail line close to the rail intersection and utilizations that detecting sign to the Arduino produce a voltage signal which controls the intersection door for open and close.

1.2 Project Objectives

To accomplish an undertaking, the objective of the endeavor should be clear and can be understood to achieve. Thusly, the objectives of this project are:

I.   To develop a program that can recognize the coming up rail and can give between the sensor and microcontroller.
II. To make a program that can handle the railroad crossing portal viably.
III.   The Arduino Star limited scope will attempt to explore.

1.3 Scopes of the Project

The purpose behind the venture is to create or structure a system that can perceive the train and subsequently give a reprobation using the alert. Right when IR- sensor-IN recognizes a train then Arduino gives sign to servo motor by IR-sensor- IN. The made program will handle all data to control the crossbars. In the occasion that the crossbar is being stopped right the bat it might be settled. The endeavor can be furthermore improved differing. Keeping up expense is similarly astoundingly low.

1.4   Report Outlines

The undertaking is a high level railroad crossing framework made with an Arduino proficient little and IR sensor and a few distinct portions. The essential purpose of the venture is to distinguish the proximity of a train on the rail line also, control the crossbar.

Chapter-2-Hardware Reviews: To complete this project, various kinds of examination what's more, stall the automated railroad crossing system and their hypotheses had been done. A couple of sources were being the reference for this assessment, for model, compositions book.

Chapter-3-Theoretical Model: In this Arduino IR sensor and Servo Engine interfacing, Arduino ace tinier than foreseen is utilized to. Control the entire procedure. An IR sensor is utilized for distinguishing condition which gives a flag on each 10mV change at its yield stick.

Chapter-4-Analysis and Simulation: There are a couple of C compilers accessible for the Atmega328 microcontroller. These compilers have numerous comparable highlights and they would all be able to be utilized to create C based elevated level projects.

Chapter-5-Result and Discussion: The mechanized movement of the railroad passage at the level convergence, the time it is opened isn't actually the genuinely worked portals, and it also slaughters human work. This sort of entryways can be used in a robotized level crossing point where there is a higher chance of incidents and safe action is required. Since the movement is modified mix-up due to manual movement is thwarted. Moreover, the structure of the railroad system that can regulate train accidents can be consolidated.

Chapter-6-Conclusion And Future Work: To keep up an essential decent ways from these certifiable accidents we need to change manual work to this most recent headway (Programmed Railroad Door Control). A couple of ideal conditions and downsides of using modified railroad gateway control.

CHAPTER 2

HARDWARE REVIEWS

2.1 Introduction

A couple of kinds of examination and investigation of the programmed railroad crossing framework and their hypotheses are grasped to complete this project. Various files, for instance, perusing material, journals and web beginning stage were the reference for this examination. A couple procedures have been refined from past exploration to deal with this current assignment's concern and related to the theory.

2.2 Component List
There certain segments of this project are given beneath:

1. Arduino pro mini
2. Microcontroller (Atmega328)
3. Servo Motor
4. Buzzers
5. LED
6. Connector
7. Vero board
8. Soldering Wires
9. Power Supply
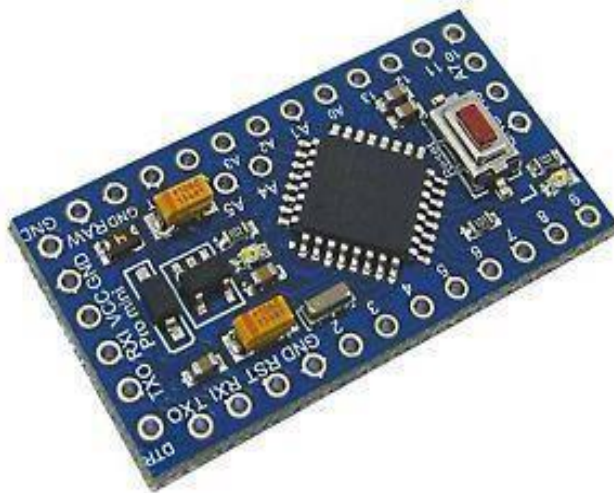
2.2.1 Arduino Pro Mini

Figure: 2.1 ArduinoPro mini

In this project, we have utilized a microcontroller to control entire the cycle of a framework that is Arduino Genius Scaled down board. In reality, Arduino is certainly not a simple regulator as it has a working framework or boot-loader which runs on. This is a 5V Arduino running the 16MHz bootloader. The Arduino Expert little doesn't accompany connectors populated so you can bind in any connector or wire with any direction you need.
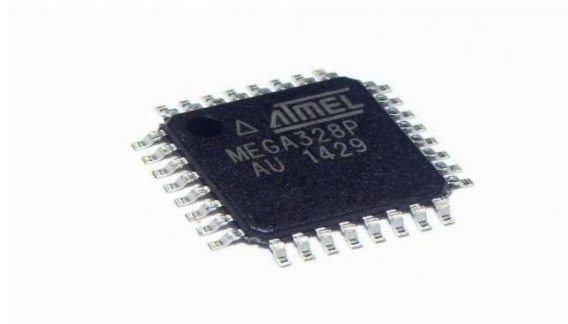
2.2.2 Microcontroller

Figure. 2.2 Atmega328 Microcontroller

A microcontroller is a singular chip more limited size PC containing a processor community, memory and programmable data/ output peripherals on a singular composed circuit.

Fundamentally, microcontrollers are utilized in subsequently controlled things and contraptions, for model, engine control systems, implantable helpful devices, far off controls, office machines, contraptions, power gadgets, toys and other introduced systems. A microcontroller is available in different word lengths like chip (4bit,8bit,16bit,32bit,64bit,and128-piece microcontrollers are available today). Here we use Atmega328 microcontrollers. The Atmega328 is one of microcontroller chips that are used with the notable Arduino ace limited scope Duemila nove sheets. There is Arduino Duemila nove board goes with one or the other 1 or 2 microcontroller chips. Of these 2, the Atmega328 the updated, further created chip. In this article we will go over the pinout of the Atmega328 chip. The Atmega328 is a particularly standard microcontroller.

2.2.3 Servo Motor

Figure: 2.3 Servo Motor.

Servo engines are also utilized in mechanical applications, apply self-rule, in line collecting, pharmaceutics and sustenance organizations. For quite a while, servo motor have been around are used in various applications. In any case, they are minimal in size sneak up out of nowhere and are extra normally reasonable to the extent essentialness. These features empower them to be engage them to be utilized to work far off controlled or radio-controlled toy vehicles, robots and planes.

2.2.4 Buzzers

3   Piezoelectric Sounders are sound parts that make sound sensible for use as data signals without vacillating circuits irrefutably. This brand name licenses them to be used in a wide combination of purposes. They come as the sort of SMD, ideal for pitiful, high-thickness mounting and such a stick that can be used for general purposes. Piezoelectric signs are fragments of sound that produce a droning using an inherent vacillating circuit.

4

2.2.5 LED

Figure: 2.5LED

The LED is a light source that makes light using semiconductors and electroluminescence. There are two sorts of light emanating diodes that are striking: LED and OLED. Corresponding to EL light, the Drove is special in that it utilizes a little valuable stone semiconductor. With reflectors and different parts to make the light more marvelous and focused in a particular point. Utilizing a level sandwich of materials, the OLED is essentially equivalent to the EL light in arrangement. It is extraordinary in connection to the Drove and EL light as it utilizes common particles in the light emanating layer.

2.2.6 Connector

Figure: 2.6 Connector

An electrical connector, an electrical circuit mix device.

• Sound and video affiliations, electrical connectors (or optical connectors) for the

Communicating of sound sign and picture action, both basic and complex.

• Sexual orientation of connectors and fasten.

• Force connector's devices permitting the electrically worked stuff to be joined to the basic turning steam (AC) supply.

• RF connector, an electrical connector planned to work at radio frequencies in themulti - megahertz go.

• Round connector.

• Daze mate connector, one where you can't see or hear the mating activity. Ensures that it is adjusted successfully. We change the features that permit a little misalignment.
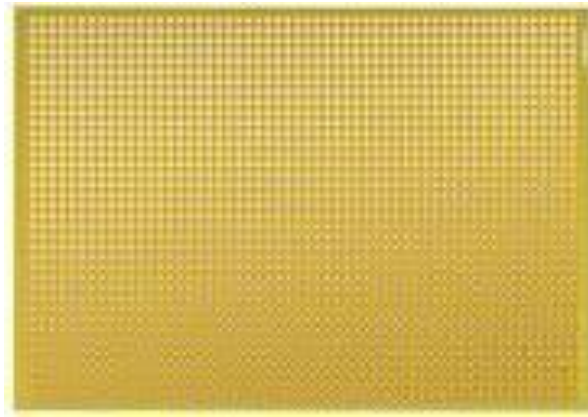
2.2.7 Vero board

Figure: 2.7 Vero Board

Vero board is a sort of stripboard, a pre-formed circuit board material made of copper strips on a protective board. What is the customary name for a conventionally used sort of gear prototyping surface addressed by a 0.1 inch standard organization of openings with gigantic equivalent strips in copper cladding running one course over a side of the board. The name of the chief fragment Vero table, which is a brand name of the English affiliation Vero Innovations Ltd and of the Canadian affiliation Pixel Print Ltd is consistently additionally seen. In the use of the deck, breaks are made in the tracks to separate the strips in different electrical communities for the most part around openings. Given this, it is conceivable to part through openings to consider areas that have two stick pushes only one separate region, for instance, twin portion headers for IDCs.
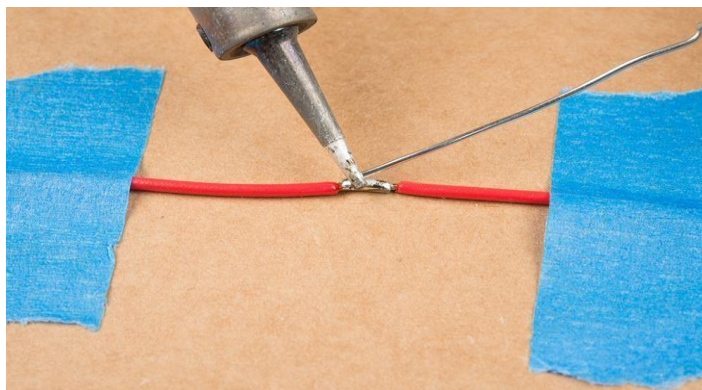
2.2.8 Soldering Wires

Figure: 2.8 Soldering Wires

Weld is basically a "low" fragile metal wiring where low is satisfactorily low to separate with a coupling iron for our motivations. It's for the most part a mix of tin and lead for contraptions. Presently, the electrical affiliation prompts a chilled association pipe. The mechanical contact between the wires is satisfactory. Each wire's fibers should be changed over and be kept dynamically like a desolate part. The underlying advance is to mount the wires and dress the wear at this stage by partner the wires with the join together.

2.2.9 Power Supply

Figure: 2.9 Power Supply

A battery holder is at any rate one compartments or chambers for holding a battery. For dry cells, the holder should in like way show up at the battery terminals. For wet cells, joins are typically associated with the battery terminals, as is found in vehicles or crisis lighting hardware. It is either a plastic case with the state of the lodging framed as a compartment or then again an other plastic holder that is mounted with screws, eyelets, stick, twofold sided tape or different strategies. Battery holders may have a spread to hold and check the batteries. Curved spring wire or level tabs that press against the battery terminals are the two generally conventional techniques for making the electrical relationship inside a holder. Outside relationship on battery holders are ordinarily made by contacts with pins, surface mount feet, tie drag or wire leads.

2.3 Summary

The part depicts about some huge stuff that related to the venture. Depicts of all hardware like Arduino, Microcontroller (Atmega328), Servo Engine, Bell, Driven, Connector, Vero board, that works fittingly use for show data read related this undertaking.

CHAPTER 3

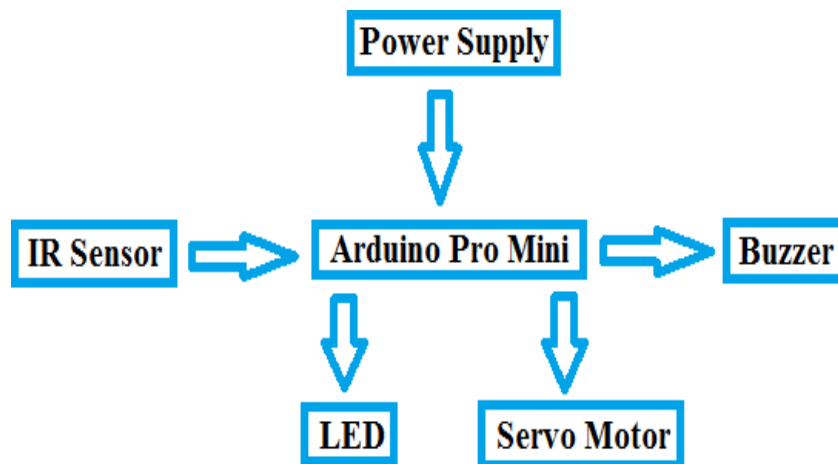# THEORETICAL MODEL

3.1 Basic Block Diagram

Figure: 3.1 Basic Block Diagram

Arduino expert scaled down is utilized to screen the entire methodology in this Arduino IR indicator also, servo engine interface. An IR sensor is used to recognize conditions that flags on its yield switch on each 10mV switch. The voltmeter can be used to screen VCC at switch 1 and Ground at switch 3 with voltage at switch 2 of the IR sensor. Missing a great deal of length you can regulate it. If the IR sensor voltage which infers that the servo motor is working a Light, is 250 m volt this is a legitimate framework. By using advanced switch 3, Arduino examines IR sensor voltage and change 3 plays out a PC based servo motor run evaluation. This picture is shipped off the servo engine after Arduino sends it.

3.2 Circuit Diagram and Explanation
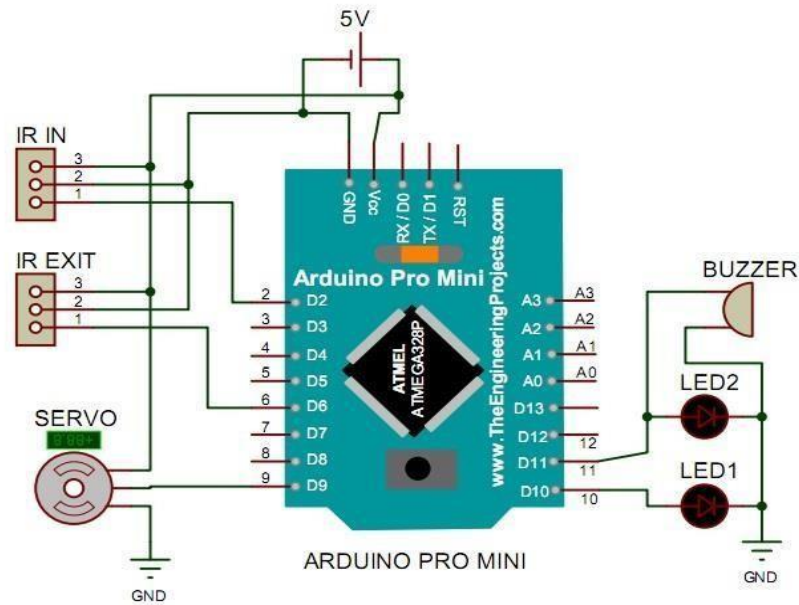
Figure: 3.2 Arduino Circuit Unit

Circuit graph for Programmed Railroad Intersection utilizing Arduino, IR sensor is showed up in the above figure. Make the affiliations warily as showed up in the schematic graph. Data pins of Drove are related with Arduino progressed pin number 10 furthermore, 11. Two IR sensors, In and Exit are in like manner related with Advanced Pin 2 and 6 of Arduino. Servo motor is related with Arduino progressed pin number 9. Too, two IR sensors and servo motors Vcc and GND are related with Arduino automated pin number Vcc and GND.
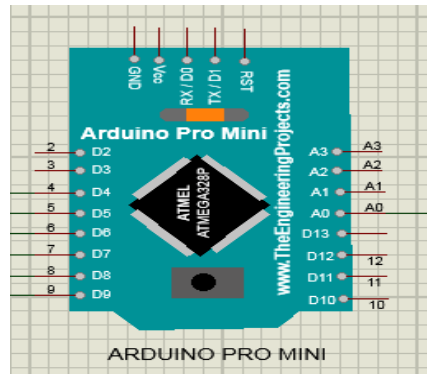
3.2 Arduino Circuit

Figure: 3.3 Arduino Pro Mini Circuit Atmega328

Arduino Master Smaller than expected circuit was develop and the rule sections for the essential circuit for this Arduino are required to work the Arduino Professional more modest than expected. At this moment, Arduino is related with the two IR sensors and power supply for a wake up the Arduino.

3.3 Advantages and Disadvantages of Arduino

There are a few preferences and impediments of Arduino. These are given beneath:

3.3.1 Advantages

These are a few advantage of Arduino:
• It is modest.

• It goes with an open stock gear feature that awards customers to develop their own personal pack.

• The result of the Arduino is proper with a wide scope of in movement structures like Linux, Windows, Macintosh, etc.

• It is like way goes with open save programming framework highlight that grants exceptional programming structure experts to utilize the Arduino code to consolidate with the ordinary programming language libraries and might be extended and changed. It is anything but difficult to use.

3.3.2 Disadvantages

These are a few disadvantage of Arduino
• The preparing power is more vulnerable than the miniature regulator.

• Nonetheless, after you get hold and request on embedded structure plan and are in the strategy for organizing pushed structures, Arduino isn't sensible differentiated with other available decisions.

Summary
In this part has talked about square chart, circuit outline Preferred position and Impediment of this endeavor. It has moreover explained the working game plan of the project.

CHAPTER 4

ANALYSIS AND SIMULATION

4.1 Writing and Burning Programming into the Arduino

The composition and consuming cycle of the program into the Arduino are given beneath
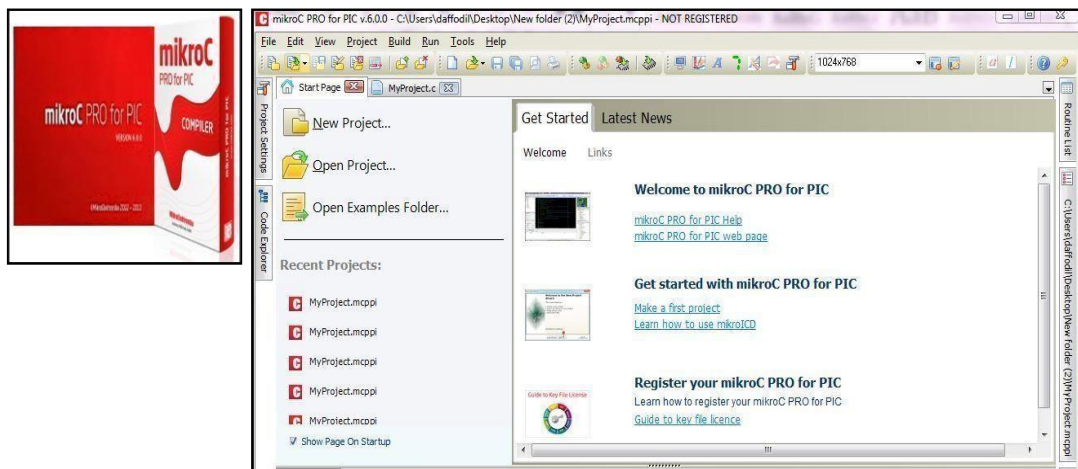
4.1.1 Writing Programming

Figure: 4.1 Micro C software

The Atmega328 microcontroller has a couple of C compilers accessible. These compilers have various similar features and they would all have the option to be used to make C based raised level projects for Atmega328 microcontroller a segment of the C compilers used much of the time in business, present day and enlightening. The scaled down scale regulator like Micro C, CCS, an Atmega328 are for the Atmega328 applications. This assignment is used by micro C. The standard and notable micro C is definitely not hard to learn and goes with the high resources. More limited size C is an in-circuit debugger and a certain test framework. The item is collected by a Micro C compiler and a hexadecimal code is made after the change methodology. The Micro C for composing programming showed up in figure 4.1.

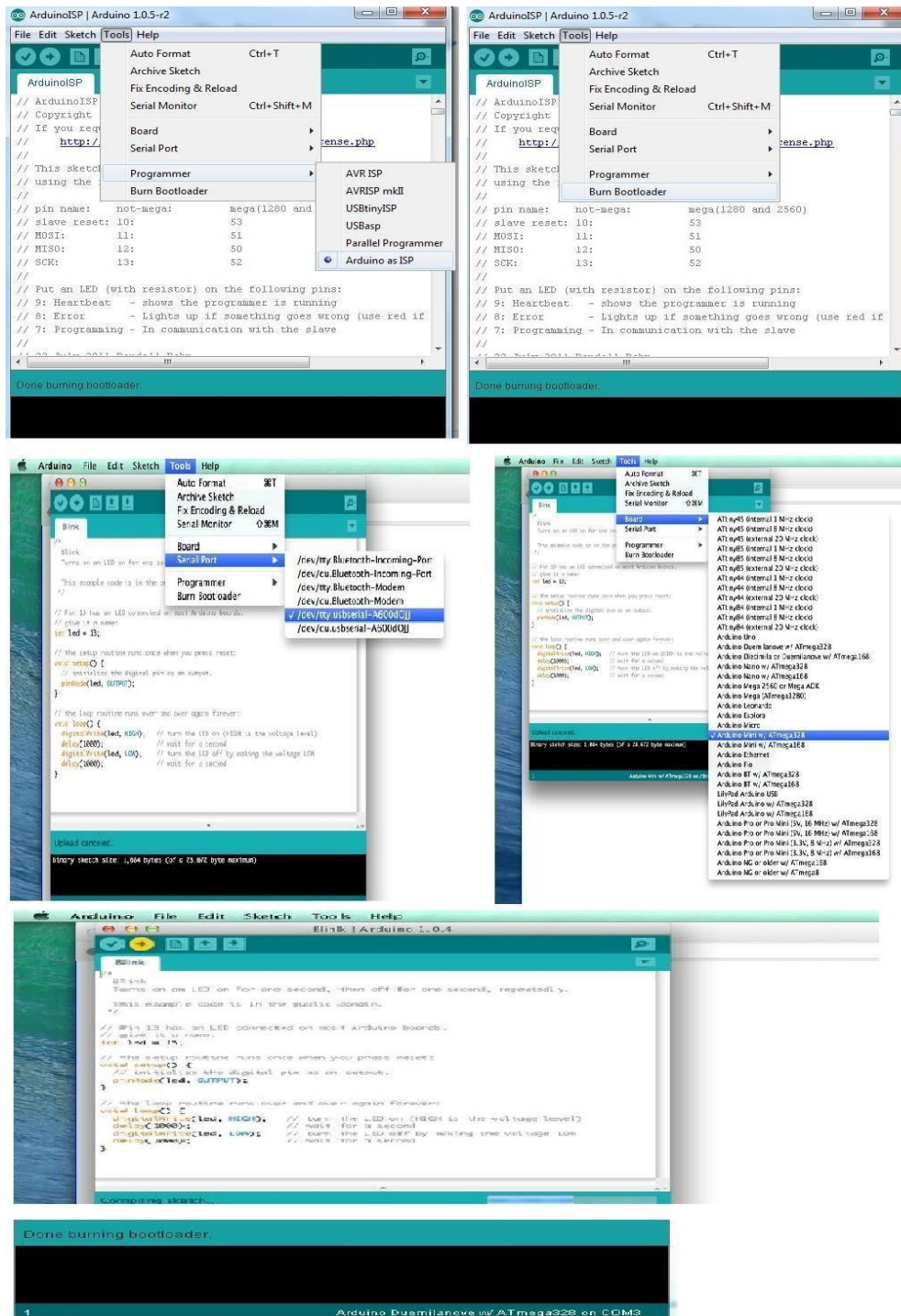## 4.1.2 Burning the Program

Figure: 4.2 Burning Boot Loader Process

Associate the all circuit association presently open the Arduino programming and select Instruments >Board - >Ardunio Star or Ace Small scale (5V, 16MHZ)/ATmega328. In the event that we select the Arduino master I can see the picked board in the base of the item as showed up in the above picture.

What's more, open the coding I need to program and tap the trade button. Before long I can see that program moving into capable little scope. I can see the Tx and Rx Drove in Arduino Uno board sparkling while program moving. Subsequent to moving of the code. Eventually clear all association and give power supply to the expert near nothing. My code works entirely on Arduino scaled back.

4.2   Flow Chart of the System

The stream diagram of this project is given underneath:
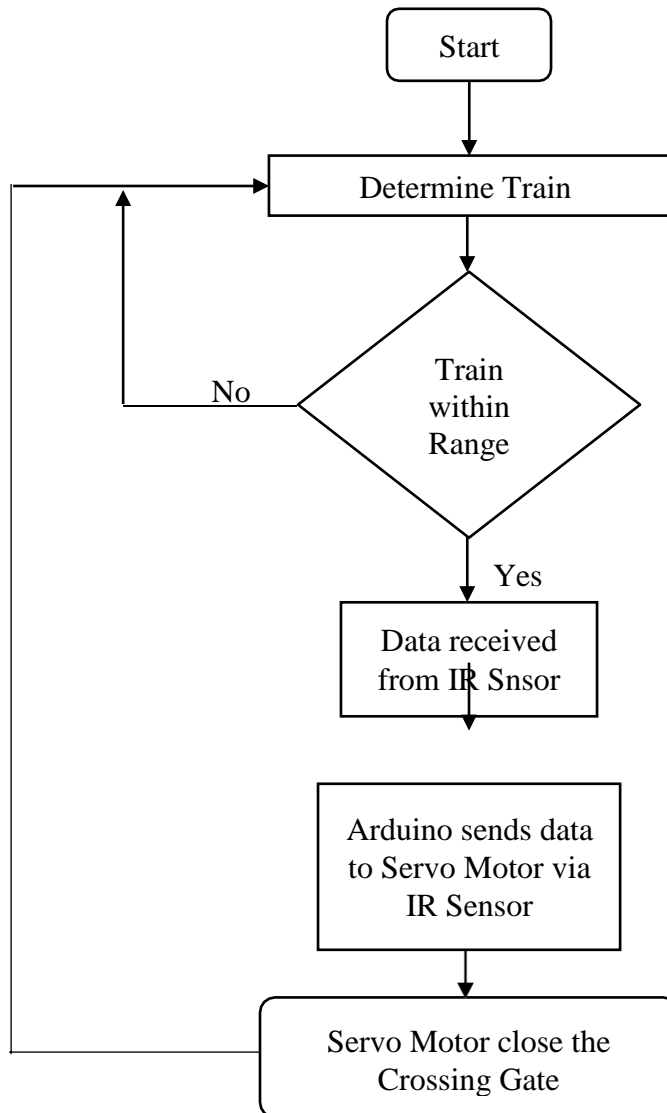
Figure: 4.3 Flow chart of the System.

4.3 Summary

In this part has analyzed about synthesis and burning-through the program. Also analyzed and stream layout system. It has moreover explained about these subjects of the endeavor.

CHAPTER 5

RESULTS & DISCUSSIONS

5.1   Introduction

This section will speak to all the outcomes and conversation about this significant undertaking.

5.2   My Project

6   In the wake of interfacing all hardware as per the circuit I had made the body structure following to the next test model from the web. After setting up the body structure and association of the circuit I arranged a rationale program with the assistance of C++ program by Arduino. My venture picture is given beneath:
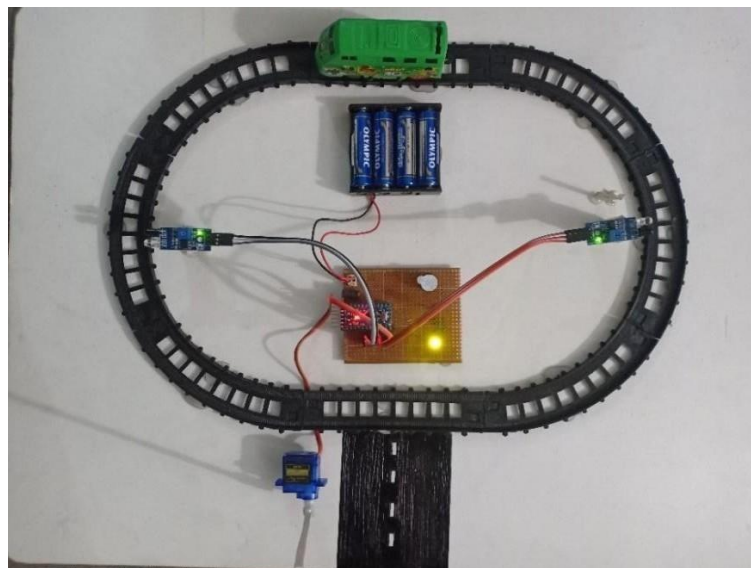

Figure: 5.1 Project Picture

After complete the program, I transferred the program to the Microcontroller. At that point I interface the product and equipment part.

In the wake of finishing the whole program and body with the interface I had attempted to try it will be it work or not. I saw that my project works impeccably.

5.3   Working the Project
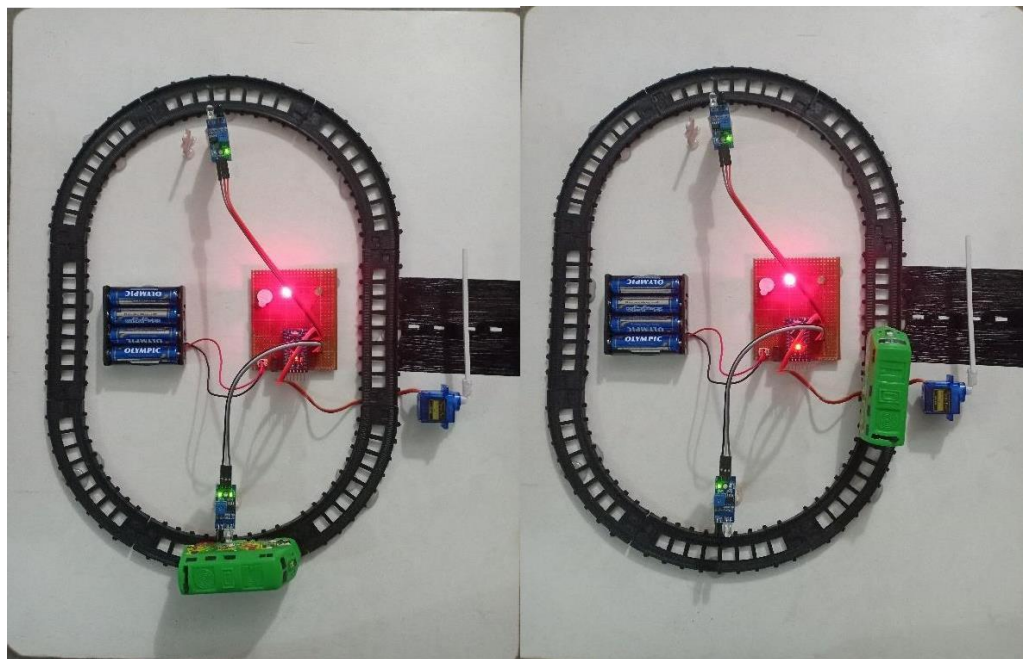
Figure 5.2: Step-1

Step – 1: When the train enter and passes the station, the current system is therefore worked. Servo motor closes the convergence entryway with a notification alert thusly. At the moment that the train enter the extent of Sensor-IN, by then getting the information from Sensor-IN, the servo motor closes the portal thusly on the arranging at which the train appears.

Step – 2: When the train passes the Sensor-EXIT in the station, getting the data from Sensor-Leave, the servo engine open the door naturally on the timing at which the train leaves.

Figure: 5.3 Step - 2

5.4   Result

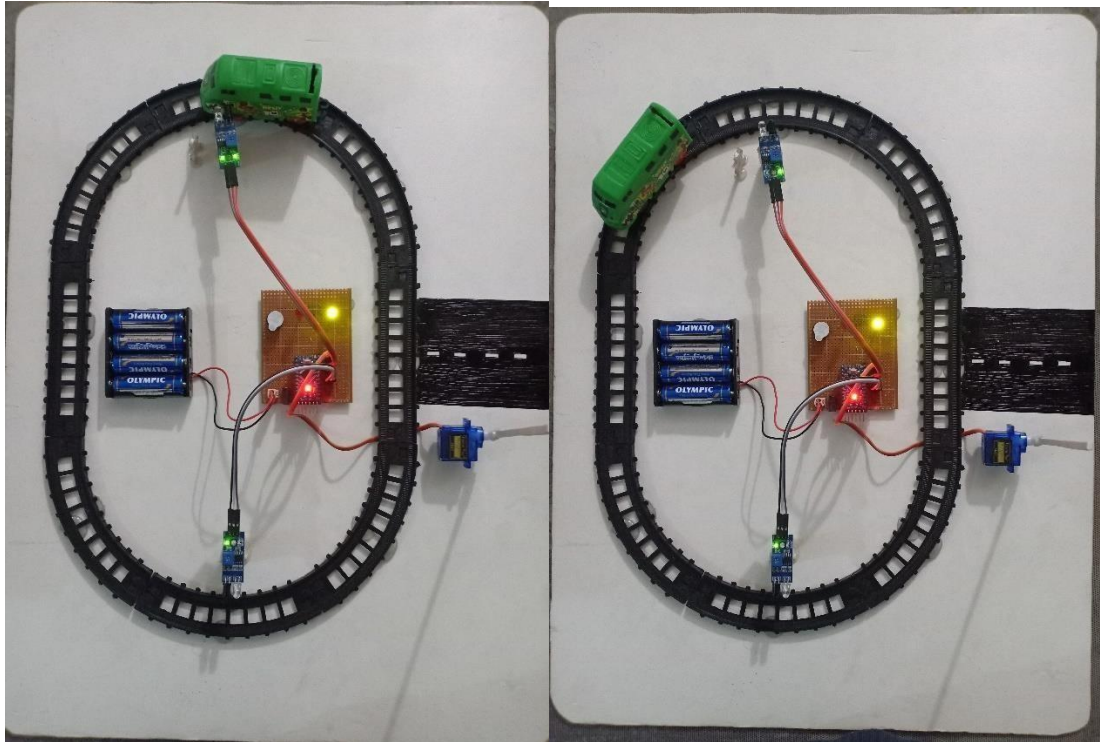Computerization of the end and opening of the railroad door using the switch circuit reduces the setbacks to a more noticeable expand. Whether or not a man or an animal walks around the sensor by the track, whether or not the train doesn't appear, the sensors are kept over the ground according to the height of the train so the gateways don't close without getting the train information wrong. This is in light of the fact that the stature of a commonplace is never identical to the height of a train. Along these lines, the sensors have been raised. If this system is presented everywhere, by then the setback will be less. There is united system is open straightforwardly signals are control by mean of interlocking and wrong signals and sign contraption which is totally modified structure.

5.5 Cost Analysis

Serial	Components	Price in (BDT)
01	Arduino Pro Mini	400/-
02	Servo Motor	550/-
03	Connecting wire	80/-
04	Power supply	140/-
05	Vero board	330/-
06	Wire connector	200/-
07	IR Sensor	100/-
08	LED	120/-
09	White Wood Board	250/-
10	Glue Gun Stick	550/-
11	Reel Connector	150/-
12	Charging Port	120/-
13	Buzzer	130/-
14	Others	100/-
	Total Cost	3220/-

Table: 5.1: Cost Analysis

5.5 Summary

The robotized activity of the railroad door at the level intersection, the time it is opened is not exactly the physically worked entryways, and it additionally dispenses with human work. This sort of entryways can be utilized in a mechanized level intersection where there is a higher possibility of mishaps and safe activity is required. Since the activity is programmed mistake because of manual activity is forestalled. Also, the plan of the railroad framework that can oversee train mishaps can be merged.

CHAPTER 6

CONCLUSIONSAND FUTURE WORK

6.1 Conclusion

The project work" automatic Railroad gate Control", these days a particularly huge number of occurrences occur at the railroad entryway due to manual control. To keep up an indispensable decent ways from these veritable mishaps, we need to change manual work to this most recent headway (Programmed Railroad Door Control), we can dodge the best number of incidents.

6.2 Limitations of the Work

Notice not many impediments or difficulties looked in my work. In this project, we have confronted not many issues as like as:

- To build up the whole organization is very expensive errand. Energy necessities are high.

- Involves complex organization of associations and require talented labor force to fabricate it in a decent way.

6.3 Advantages and Disadvantages of the Project

These are a few points of interest of programmed railroad crossing:

6.3.1 Advantages

These are a few advantage of programmed railroad crossing:

- Security and nature of administrations
- This sort of doors can be utilized in a robotized level intersection where the odds of mishaps is higher and dependable activity is required.
- Great response to around by utilizing this project.
- Less tedious.
- Programmed activity forestalls mistakes because of manual activity.
- At long last, there is no requirement for HR. This outcomes in low running costs comparative with staffed doors.

6.3.2 Disadvantages:

These are a few disadvantage of programmed railroad crossing:

- Enormous force prerequisites.
- Exchanging clamor and wave exist.
- Significant expense of components.

The Arduino board is sensitive gadget so it must be dealt with cautiously.

6.4   Future Scopes of This Project

Human may submit botches or blunders so automating this system will decrease the chances of gateway dissatisfactions. Computerization of the end and opening of the railroad entryway using the switch circuit decreases the setbacks to a more unmistakable expand. In spite of the reality that the sensors is raised to no make a horrible sign. Regardless, later on for improving this undertaking, for instance, if a winged creature flies before the sensor, the sensor can be revived by using dynamically advance development so the sensor doesn't bestow an unseemly sign. If this structure is presented everywhere, by then the setback will be less.

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APPENDIX

The code of Automatic Railway Crossing Project:

The code of Programmed Railroad Intersection Undertaking:
/Program: Programmed Railroad Intersection (MMI)

```
#include <Servo.h>

Servo myservoA;

const int ProxSensorIn = 2;

const int ProxSensorExit = 6;

int LEDA = 10;

int LEDB = 11;

int ServoM = 9;

void setup(){

pinMode(LEDA, Yield);

pinMode(LEDB, Yield);

myservoA.attach(ServoM);

pinMode(ProxSensorIn, Information);

pinMode(ProxSensorExit, Information);

myservoA.write(90);

}

void circle()

{

if(digitalRead(ProxSensorIn) == LOW){

digitalWrite(LEDA, LOW);

digitalWrite(LEDB, HIGH);

myservoA.write(0);

if(digitalRead(ProxSensorEXIT) == LOW{

digitalWrite(LEDA, HIGH);

digitalWrite(LEDB, LOW);

myservoA.write(90);

}

}
```