Ahsanullah University of Science & Technology
Department of Computer Science & Engineering
Semester Spring 2021

CSE 3216

Microcontroller Based System Design Lab

Project Proposal

Project Name: Smart Traffic Control System

Submitted To

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Objective

The main objective of this project is to adjust and control flow of traffic in order to fulfill the needs of vehicle flow and to reduce the waiting time and also designed to improve the standard of driving at city and to reduce accidents. The proposal aims at digitalizing the railway gate control system, introducing standard car parking system, reducing the traffic jams in order to reduce traffic congestion, optimize traffic flow and help pro-actively manage traffic conditions.

Social Values

One of the most challenging and complicated issues in the city management in the present decade for Bangladesh is the traffic problem. It is a very common phenomenon in almost all the cities of Bangladesh. Presently, traffic congestion problems in Bangladesh are increasing at an alarming rate. The traffic problem has become to a very dangerous arena and has already implicit agonizing extent in the cities of Bangladesh. Again, the reckless driving is causing a lot of accidents. Moreover, careless railway control system has taken the lives of many people and since the number of vehicles are growing rapidly in our country a standard car parking system is also very necessary. In these circumstances, taking over the power from the hands of human and handing over it to an organized and automated railway, car parking traffic system would be more preferable. So, this is the main motto of our project.

Required Components

These following parts and tools are required for building this project -

- Arduino Mega
- IR Sensor
- Servo Motor
- Buzzer
- Dotted Veroboard
- Jumper Wires
- Male Header
- Female Header

- Traffic Light Module
- 16*2 I2C LCD Display
- LED
- Wires (Female to Female, Male to Male, Male to Female)

Working Procedure

The basic components that react to the input are -

• Servo motor

It controls the movement of crossing gates to be closed for blocking the road when a train is coming.

• LED Lights (Red, Green)

It gives a visual signal to vehicle traffic and train by red and green lights.

• IR sensor

Infrared sensors are another type of sensor often used in traffic signals. Active infrared sensors emit low-level infrared energy into a specific zone to detect vehicles and trains. When that energy is interrupted by the presence of a vehicle the sensor sends a pulse to the traffic signal to change the light and when that energy is interrupted by the presence of a train the sensor sends a pulse to the Servo motor to block the road using crossing gates.

• Buzzer

Alarm rings when a train is crossing the road.

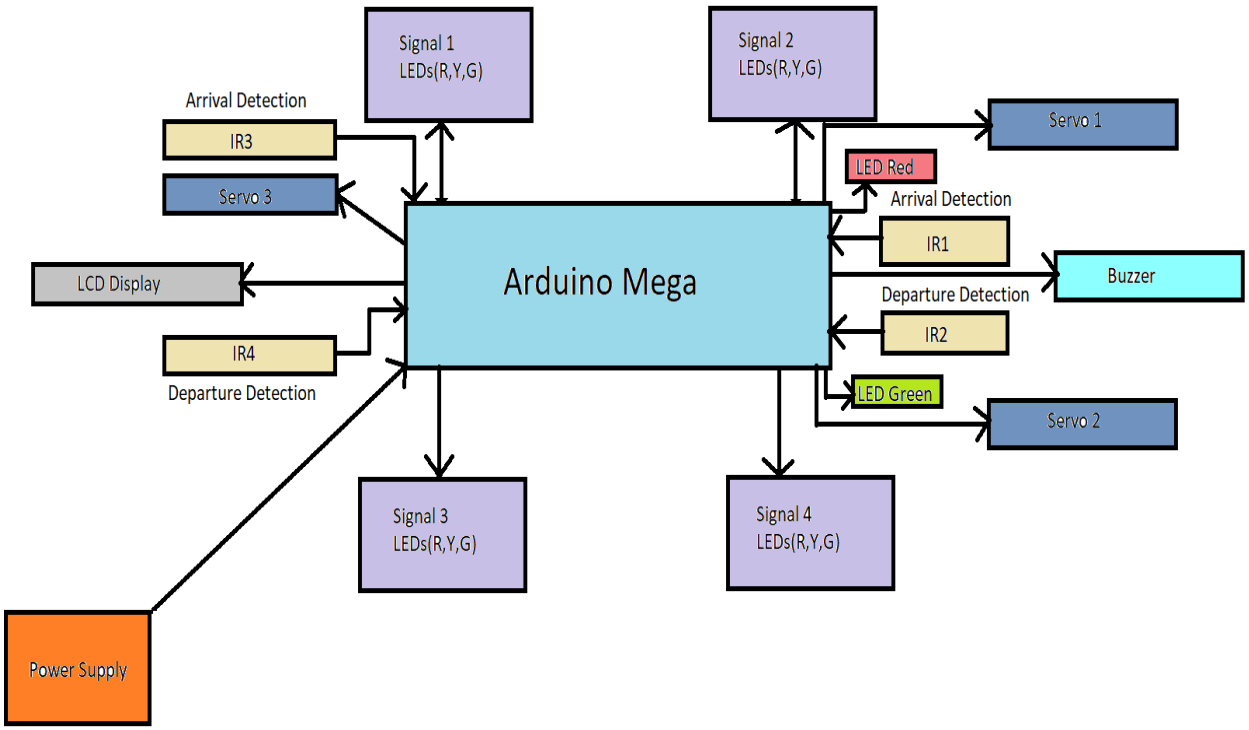
• LCD Display

We used it in car parking system where it displays how many slots are left for parking.

• Traffic Light Module

We used traffic light module in traffic light controlling system for vehicles.

The Block Diagram of our project is attached below:



Budget Comparison

Previous Estimated Budget

Equipment	Quantity	Budget (Tk)
Arduino Uno R3	1	650
Male to Male, Female to Female and Male to Female Wire	As required	100
PVC Board	1	95

IR Sensor	4	320
LED	As required	100
Servo Motor	2	400
Jumper Wire	As required	100
9 Volt Battery	1	60
Buzzer	1	15
Male Header and Female Header Pins	As required	180
On-Off Switch	1	10
Battery Clip	As required	20
Dotted Veroboard	1	25
Total		**2045**

Current Estimated Budget

Equipment	Quantity	Budget (Tk)
Arduino Mega 2560	1	1650
Male to Male, Female to Female and Male to Female Wire	150	210
PVC Board	1	95

IR Sensor	4	320
LED	2	4
Servo Motor	3	585
Traffic Light Module	4	320
LCD Display	1	220
Buzzer	1	15
Female Header Pins	1	15
Male Header Pins	1	25
Dotted Veroboard	1	25
Total		**3484**

We can see that the current estimated budget is way higher than the previous estimated budget because we needed more tools than we have previously estimated. As we have added more features in our project, we had to choose Arduino Mega instead of Arduino UNO which is the main reason for the immense change in our budget estimation also we had to buy some more tools in higher quantity than we estimated.

Contribution of Team Members

We, 4 members of our group, worked together in the varsity campus, from the very first, to come up with the project idea, setting up our project plan, connecting the components, coding the system, and building the

prototype till the end of completing the project. Hence, the contribution of all the team members was equal.

Depending on it, the percentage can be,

- Shayla Sharmin Niha – 18.02.04.095 – 25%
- Afroja Afrin Oieshi – 18.02.04.104 – 25%
- Tahsin Tasnim – 18.02.04.107 – 25%
- Afzalun Nahar Nobonee – 18.02.04.113 – 25%

Challenges in Our Project

1.The first challenge was, as we were a group of four girls so it was quite difficult for us to buy all the tools as these tools are not available everywhere.
2.Secondly, when we ordered our stuffs from online shop, they gave us temperature sensor instead of infrared sensor and some of the other tools where faulty as well so we had to buy those tools once again.
3.Lastly, as we have included three different projects here, it was very difficult for us to merge all these projects together.
But we have successfully overcome all these challenges and were able to build our project.

Conclusion

Our Arduino-based Smart Traffic Control System can be used globally to control the traffic on roads. This system can be installed to maintain an organized traffic system and car parking system by which people can save their valuable time. Moreover, the traffic control system can be very useful to avoid accidents and train passing buzzer alarm. We also have some

future plans in adding some more features. We are planning to add density based traffic control system in future.