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AUTOMATIC RAILWAY GATE CONTROL SYSTEM

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ABSTRACT

The main aim of this project is to operate and control the unmanned railway gate in the proper manner in order to avoid the accidents in the unmanned railway crossing. In a country like ours where there are many unmanned railway crossings, accidents are increasing day by day. These train accidents are due to the absence of human power in the railway. In order to overcome the accidents due to the above problem we have planned to design the project. Automatic Railway Gate Control System with High Speed Alerting System is an innovative circuit which automatically controls the operation of railway gates detecting the arrival and departure of trains at the gate. It has detectors at the far away distance on the railway track which allows us to know the arrival and departure of the train. These detectors are given to microcontroller which activates the motors which open/close the railway gate correspondingly. If the train is near by the railway gate then the microcontroller automatically activates the alarm and this alerts the passengers.This can be implemented in manned level crossings also, as manual errors can be eliminated by automation.

INTRODUCTION

Railways being safest and cheapest modes of transportation are preferred over all the other means of transport. So, it is essential to maintain and improve the current level of safety. A safe railway is more efficient and also a more attractive transport choice, enabling society to address the environmental and economic challenges of the 21st century. Railway safety is a crucial aspect of rail operation over the world. When we go through newspapers, we come across many railway accidents occurring at different railway level crossings and many people are dying. The place where rail track and highway/road intersects each other at the same level is known as "level crossing". Bangladesh Railway said at least 201 people were killed and 349 others injured in 264 accidents at different level crossings in last seven years till 2013[1]. This is mainly due to the carelessness in manual operations or lack of workers at level crossing. There is an inherent unreliability in the present manual system. Automatic railway gate control system is an arrangement of physical components which sense the arrival of the train and make the gate pull up and pull down automatically. As a train approaches at the railway crossing from either side, the sensors placed at a certain distance from the gate detect the approaching train

and accordingly controls the operation of the gate. To avoid the accidents, sensors placed at some distance from the gate detect the departure of the train. The signal about the departure is sent to the microcontroller, which in turn operates the motor and opens the gate. Thus, the time for which the gate is closed is less compared to the manually operated gates since the gate is closed depending upon the telephone call from the previous station. Also reliability is high, as it is not subjected to manual errors. For the railway, research on automatic gate controller systems has traditionally focused on two main areas:information transmission and gate controlling. Problems related to information transmission concern train detection and fast transmission of this information to the control unit. Problems those are related to the gate controlling very sophisticated and challenging. They comprise presence of train, immediate closing and opening of gates. The existing solutions have many complexities and require research for supporting railway. This paper proposes the design and implementation issues of an automated railway gate controlling system. The system detects the train and stuck by analyzing the reflected waves, produces alarm, controls light signal and gate. When the whole train passes the level crossing then the gate is opened, alarm generator stopped and indicator light switched on green signal. If there is a stuck on the level crossing the stuck signal is switched on The lesser equipment, reduced cost, simpler design and high efficiency of the proposed system prove the effectiveness over existing work.
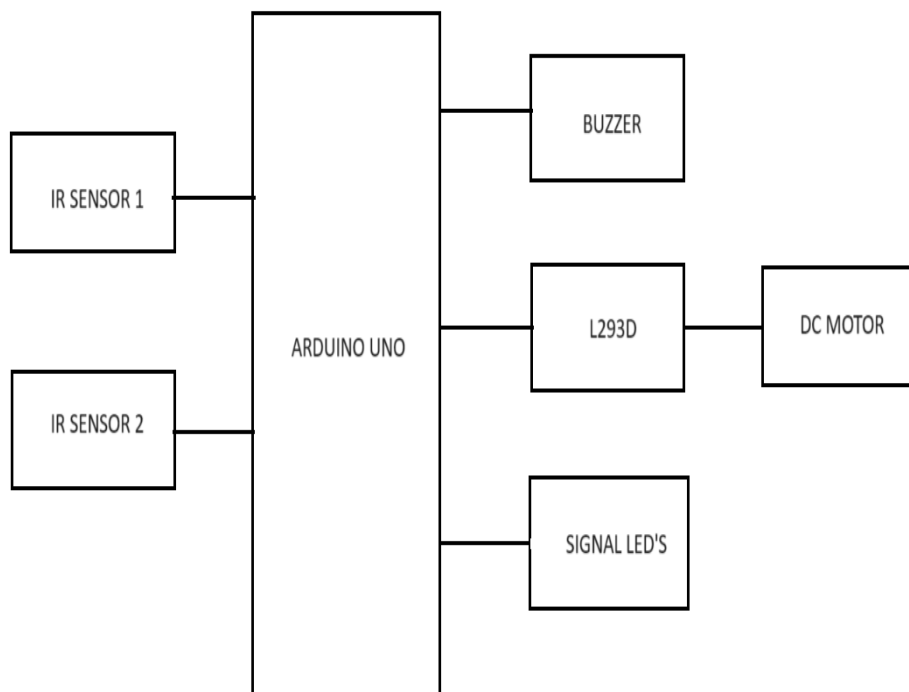

Figure.1 Block Diagram

LITERATURE SURVEY

Define Keywords and Search Queries:

Start by defining keywords related to your topic, such as "automatic railway gate control," "railway level crossing," "automatic barrier system," etc.

Use these keywords to search in academic databases like IEEE Xplore, Google Scholar, ScienceDirect, and research databases of engineering journals.

Review Academic Papers:

Look for academic papers published in relevant journals and conferences. Pay attention to recent publications for the latest advancements.

Focus on papers that discuss the design, implementation, optimization, and evaluation of automatic railway gate control systems.

Note any innovative techniques, algorithms, or technologies proposed in these papers.

Explore Patents:

Search for patents related to automatic railway gate control systems. Patent databases like Google Patents or the United States Patent and Trademark Office (USPTO) can be useful.

Patents often provide insights into proprietary technologies and can give you ideas for novel approaches.

Check Technical Reports and Theses:

Technical reports and theses sometimes contain valuable information not yet published in journals or conferences. University repositories and institutional databases are good places to search for these.

Look for Review Articles and Book Chapters:

Review articles and book chapters provide comprehensive summaries of existing research in a particular field. They can help you understand the broader context and identify key challenges and trends.

Search for Industry Publications and Whitepapers:

Industry publications, company websites, and whitepapers may contain case studies, implementation details, and real-world challenges and solutions related to automatic railway gate control systems.

Consider Standards and Regulations:

Look for relevant standards and regulations governing railway safety and gate control systems. Understanding these can provide insights into the requirements and constraints of implementing such systems.

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PROPOSED SYSTEM

The proposed system of this project is to create an automatic railway gate control system by using android which can be implemented easily in roads. Generally, there are manual gate control system which are maintained by person. As vehicles are increasing day by day it has become more difficult to control the gate manually. As a result, often many accidents occurs and many people become injured badly by accidents and sometimes it become very serious when people died and face many problems due to this type of accidents. This project can help us to reduce accidents in our country by applying automatic railway gate control system at crossing level.
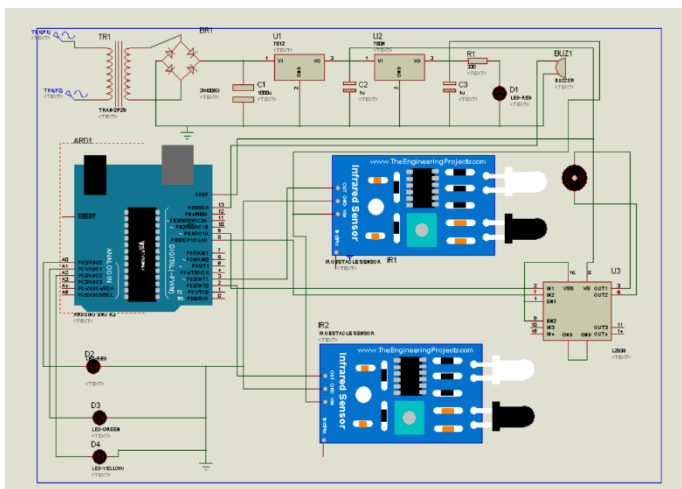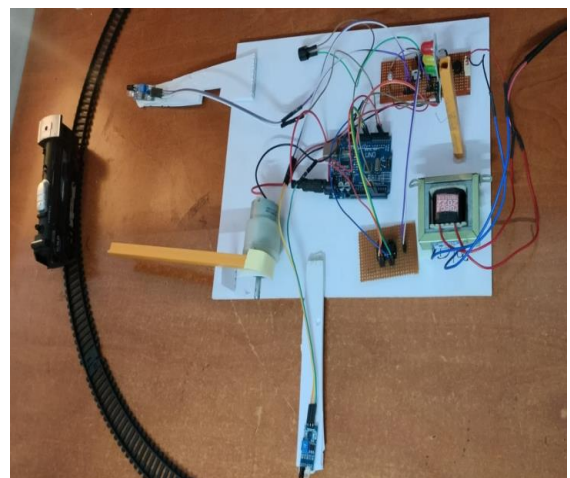

Figure.2 Schematic Diagram
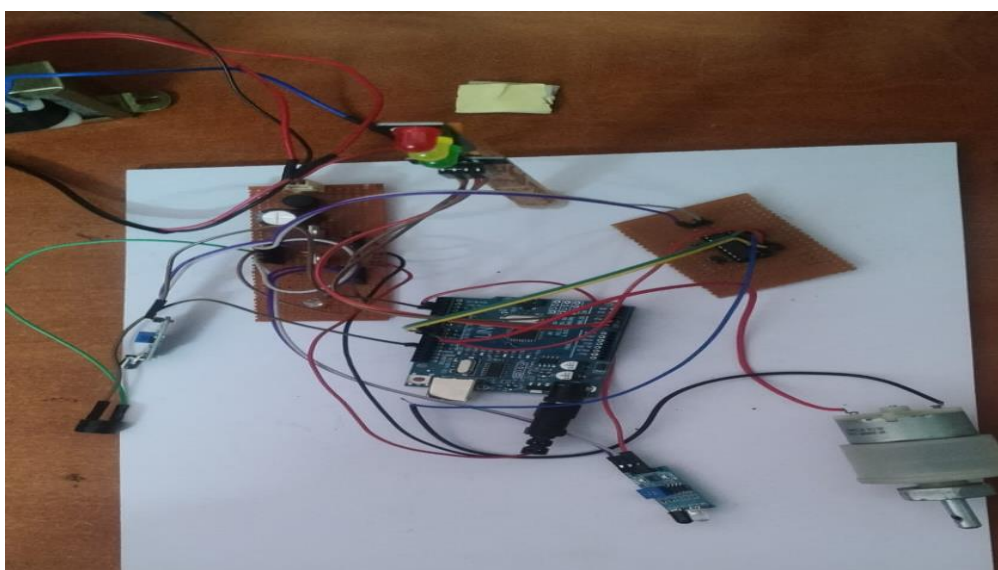

Figure.3 Working kit
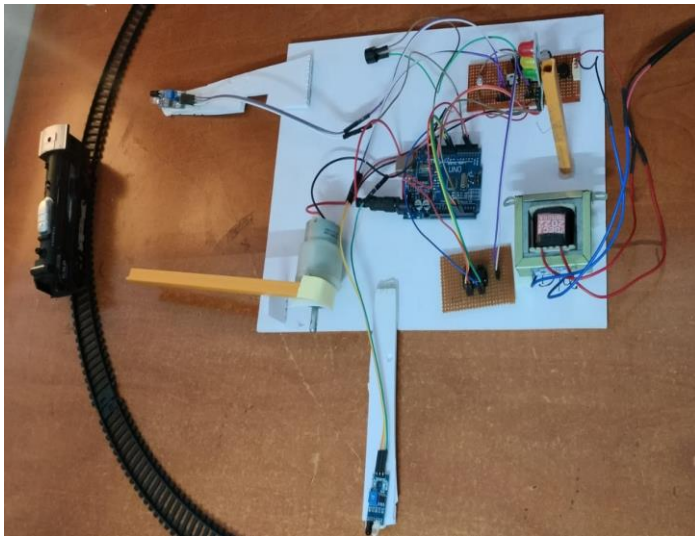
RESULTS

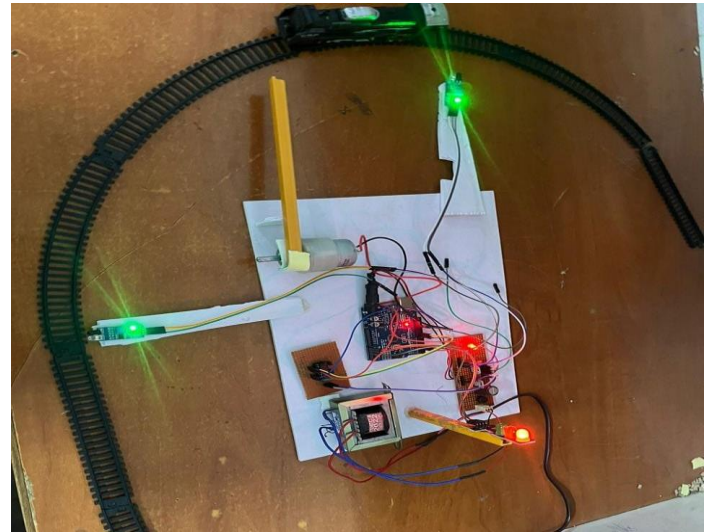Figure.4 When the circuit is OFF

Figure.5 Initial stage
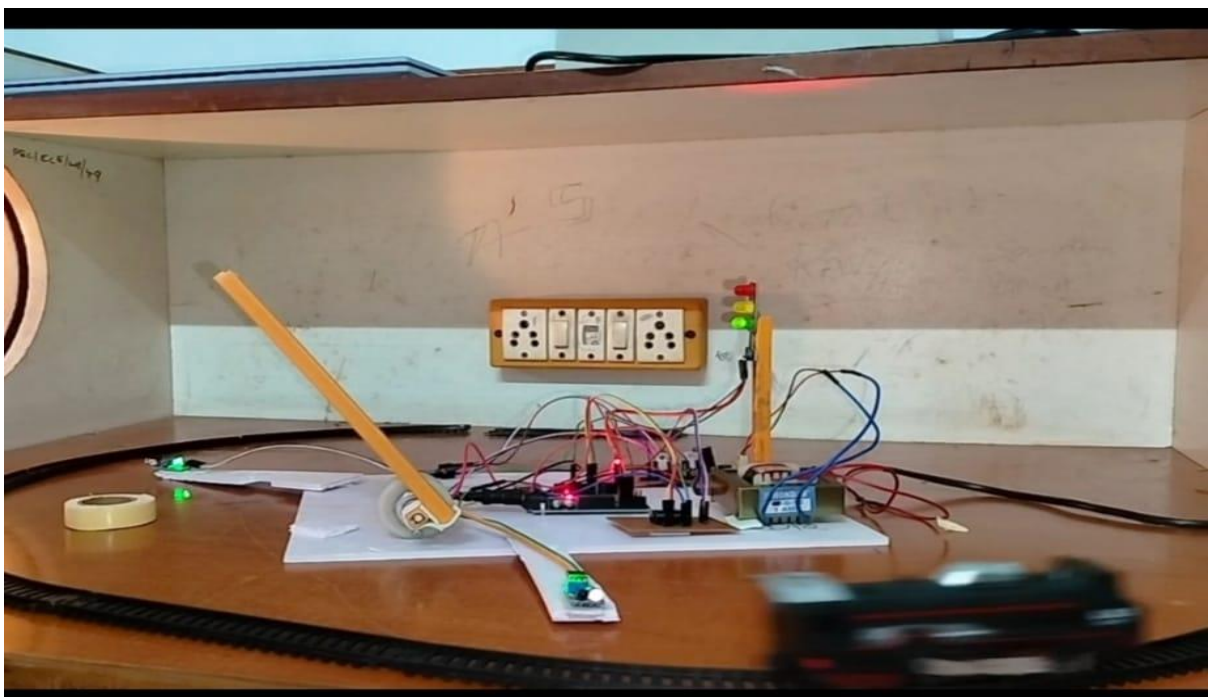

Figure.6 Cross the 1ˢᵗ IR sensor

Figure.7 Gate open

CONCLUSION

Automatic railway gate control system is centered on the idea of reducing human involvement for closing and opening the railway gate which allows and prevents cars and humans from crossing railway tracks. The railway gate is a cause of many deaths and accidents. Hence, automating the gate can bring about a ring of surety to controlling the gates. Human may make errors or mistakes so automating this process will reduce the chances of gate failures. The obstacle detection system implemented reduces the accidents which are usually caused when

the railway line passes through the forest. Most of the times greater loss has been caused when animals cross the tracks. The limitation of this project is the use of IR sensors. Hence, any obstacle in the way of the sensor will be detected. Another important limitation is that this project does indeed close and open the gate but it cannot control the crossing of cars and vehicles. It only controls the gate. To combat this problem pressure sensors can be used as extension to the present work. We are using IR sensors but it is better to use load sensors. We have not used load sensors because it was not economically feasible. As a future scope of work, our system can be implemented in real time by fixing the current limitations using new technologies.

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