Pedestrian Crossing Carriage Using Ultrasonic Sensor

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Abstract. Automation is the most used technology nowadays for the Zebra crossing mechanism used as an automatic intelligent carriage. In several areas, intersections with crosswalks are also the maximum amount as a kilometer apart, deed pedestrians with no safe thanks to cross the road. This paper analysed the rise in pedestrian crossing traffic accidents supported for the improvement of zebra crossing facilities. Pedestrian crossing may be a very important part of foot traffic analysis which may much facilitate scale back and avoid pedestrian injuries. Moreover, inappropriate planning, a fast increase in population, urbanization, and restricted road capacities in major cities have distended this matter. The main aim is to detect the pedestrian crossing in the signal walking path and design an intelligent carriage to avoid fatal death and traffic. Using ultra sensors to detect vehicles and avoid accidents.

1. Introduction
In developing countries, there is a unit large volume of two-wheelers, three Wheeler, bicyclists, and pedestrians sharing the constant road space with cars, buses, and trucks. Pedestrian safety is a problem in several urbanized areas throughout the planet. Whereas this is often recognized by policy manufacturers several tend to focus a lot on traffic jams and finding a resolution to boost traffic flow [2]. This drawback does not solely waste thousands of human-hours however is also is a devastating issue for the pollution. Let me discuss the project components. The components which are UART, Sensors, Microcontroller, I²c, DC motor.1.DC Motor (Direct Current) is used to converted electrical energy into mechanical energy and it is produced by magnetic fields.2. UART (Universal Asynchronous Receiver Transmitter) is used for transmitting and receiving the information and it's being connected with the Processor.3. Ultrasonic Sensors are used to measure the distance of a target object by emitting ultrasonic waves it can be converted into electrical signal.4. AVR Microcontroller is used to utilizing the fast sign of activity inside an implanted framework. This microcontroller has already all features and is built into a single chip.5. I²c (Inter-Integrated Circuit) is used to any microcontroller can communicate with this device using high-speed modems to transfer a large amount of data. At the same time, pedestrians have become a deciding issue for the traffic jam [1]. As roads have gotten wider it’s long to move across an equip line wherever streets area unit broader.

2. Literature Review
According to existing related works, there are several techniques used to develop the system. It ensures the better enhancement of the proposed system in this project. In some studies [2], this paper explained the spatial-temporal human representation in the dimension and the projection of the body along with columns and rows, of 1D projection over time to form a 2D pattern.
The problem that occurred in this paper is a GPS based system, so easily collision occurs. Next, an innovative approach came as a solution for the traffic signal in the system, this paper explained the traffic signal of both inside surrounding the campus various experimental data, including walking speed, stride length. [4] They calculated the walking path distance from the signal to the pedestrian crossing path. It raises a problem that does not have a threshold frequency, so people wait for a long time [6]. This paper explained the transfer hub of urban areas describe pedestrian traffic signal density of the people around the network areas and simulation in the underground. The problem that occurred in this paper raises network congestion. It is a simulation not for applying a practical application. [3], this paper explained the similar techniques which degree of periodicity in the references a curve along as tracking the centroid of a moving region in several frames. The Existing system uses a fixed surveillance camera however, that may do not differentiate between pedestrian and alternative objects. Accuracy was low once comparing the proposed system. And it was not discussing distinction issues. This system won’t able to use by children, old people, and disabled people.

Victimization may belong to the pedestrians additionally. These techniques were neither secured nor economically does it having restricted variations on-camera Quality, resolutions, do lighting condition, a background. 3Dimension lines to intimate visual illusion had been introduced. It acts as a roadblock on the road so vehicles block anyway. They will be known as precaution mechanisms for pedestrian crossings. This system is a more time-consuming process for pedestrians and not sufficient to use.

3. Methodology

It is a model to explain the techniques used to design a project. This topic explained the hardware which will be used to improve this project further. The results are going to be analyzed to achieve the aim of this project.

3.1 System Overview

The proposed system is an associate intelligent carriage resolution it can be synchronic with an alternative. The system architecture shows the component of this project is sensors, microcontroller, I2c, UART, DC motor, Battery, the power supply is enabled. The main usage of this AVR microcontroller is to provide high-speed signal processing. The microcontroller is connected with the two sensors, ADC which converts the analog to a digital signal. Ultrasonic waves up to 20,000 Hz. The Microcontroller TFT (Thin Film Transmitter) display is used. It is used for display purposes. Let’s discuss the project. When the power supply is ON they transmit the source for the receiver they connected to traffic light. The sensors used to measure the distance of the object and calculate the weight of the total carriage. If any vehicle crosses during the signal buzzer will raise the alert. The concept being proposed in the paper aims at making safe signals for pedestrians still as vehicles by, making certain that the proposed carriage is meant to travel high of a railing.

The proposed carriage is accelerating the development of the expensive real-time application. Hardware requirements increase the capability of the system. The boon of the proposed system is an

- It crosses the road within a few seconds without any delays.
- This application is safe and efficient traffic control.
This carriage is a comfortable transportation technique for any weather condition because of its shell.

3.2 Block Diagram

Figure 1 shows the block diagram of the proposed pedestrian crossing carriage system.

![Block Diagram]

Fig. 1 Block Diagram

This project following the modules that are split into four based on the work done in the proposed system. In the modules are,

- Carriage module
- Sensor module
- Traffic light module
- Power source module

3.3 Carriage module

The Proposed carriage works as an elevator that’s moving horizontally. This carriage can be placed at the top of the equip line, prime of the pedestrian platform. Once it reached the destination location of pedestrians, the carriage takes to the set location at intervals a couple of minutes. This carriage can also useful for disabled individuals and who travel via wheelchairs. Similarly, this carriage is safer than walking on the equip line with nice exposure to vehicles. Then the carriage is being designed to run on that is presently rechargeable battery. This carriage is integrated with ultrasound sensors to spot the vehicle once passing by the only lights. It programmed to achieve the destination for a few seconds. Once it reaches the most pedestrians that area is designed to be transported, the carriage starts to drive mechanically on the destination location across the road. It had been completed at intervals two to a few seconds. Thereby, the vehicle won’t get to watch for an extended time for crossing. Most of the time abrupt weather changes are occurring. Beneath such unconditional weather like monsoon showers, it’s difficult to use zebra crossing mentioned in earlier techniques.
3.4 Sensor module
Ultrasonic sensors got to be placed at the tip of either side or each end of the Road, Sight once, it passes by the closest stoplight, and it might be signaling to the vehicles that area unit holding there in the lane to undergo. Ultrasonic sensors got to be placed at the tip of either side or each end of the carriage to notice once, it's passing by the closest traffic signal, and it'd be signed to the vehicles that square measure holding in this lane to meet up with. Traffic lights are turned to red once the carriage starts. There will be turned to inexperienced once the carriage is passing a specific lane.

3.5 Traffic light module
Keeping signals inexperienced for the traffic in cases wherever there aren’t any pedestrians to cross, providing an associate to awake the visually impaired Detection of vehicles that don’t follow the traffic signals. That is placed before the carriage provides the signal that the trail is obvious. The carriage can be placed on the platform and the electronic door will close once it reaches the most amounts of passengers that may be carried at one instance. Not only the crossing time of the passengers reduced by half amount however conjointly the holding time of the vehicles is reduced since the traveling speed of the carriage is redoubled speedily. Pedestrians will cross the road during a few seconds without any delay for pedestrian safety and efficient traffic control. The signals controlled optimally supported the wants. Kept signals red to supply enough time for all the pedestrians to cross.
3.6 Power source module
The proposed carriage is a travel high of a railing. By mistreatment such DC motors, the speed of the carriage can be increased suddenly and also, it won’t be generating any uncomfortable vibrations and sounds. Lithium-ion batteries are used; as a result, they hold large amounts of energy that makes them excellent carriage. The ability supply may be charged mistreatment of two charging points that square measure placed within the supply location. For the ramp and door opening mechanism, DC (direct current motors) can be used.

4. Result
In this proposed system, the design can reduce the holding time of the vehicles and avoid accidents on the road. Implementing these carriages is also cost-effective, as a result of building an associate overhead bridge or underground tunnel is much costlier than the proposed mechanism.
Thus, this could be introduced as a sensible and low budget answers for each hold-up and fatal accidents. This carriage has a ramp that facilitates disable personnel and wheelchair travelers to induce in. For the ramp and door opening mechanism, DC (direct current motors) can be used.

5. Conclusion
This technique will minimize human death and accidents as a result, and the direct accident with a vehicle may be avoided by the shell. It can make sure about the pedestrian’s security. The carriage is helped to Traffic flowed by reduced the holding time of a vehicle. Implementing carriages are additionally costly, as a result of building an overhead bridge or underground tunnel is much cost-efficient than the proposed system. The system will minimize accidents at the traffic signals, saving lives and property, creating the roads safer for all pedestrians. The system is additionally low value and can be a step towards the smart cities that the Government of Asian nation is coming up with across the country.

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