

Road Cross Assistance for Physically Challenged People

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ABSTRACT: the concept of this work is to design an automated road crossing platform for physically challenged people. An automated platform is used to transport disabled people across the road safely. The traditional road crossing measures are not safer. Crossing the road for disabled people is not a pleasant experience. This paper presents the development of a method which assists people to cross the road. A person sits on a carrier and activates it. Depending upon the traffic density the carrier decides the perfect time to transport the person across the road. Additional safety is added by placing a small signal which is activated while the carrier is moving. Also, a buzzer is placed on the carrier to warn the vehicle approaching the carrier. The Buzzer is activated when is too near to the carrier. The man in the carrier only needs to press the button, the carrier does the rest.

KEYWORDS: automated, buzzer, carrier.

I. INTRODUCTION

One among the excluded society is the physically challenged persons; they come across many problems in their day to day life. Mental and physical incapacities are the people called disabled people.

Researchers in Japan have developed an “electronic eye” system to help blind people cross the road at busy intersections. The system consists of a camera and a small computer that can detect pedestrian crossings, including the width of each crossing and the status of its traffic lights. Instructions are relayed to the user by means of a voice speech system with a built-in speaker.

In research studies, the system successfully detected crossings 194 out of 196 times the two mistakes were both pedestrian crossings that were actually there but that went unrecognized as such by the system. The goal of the researchers is now to develop the system into a pair of glasses that a blind person can comfortably wear.

Why are the researchers only looking for one specific application of this detection technology? I imagine that a lot of blind people will not be willing to get a pair of glasses just to help them cross the road. a pair of glasses that helps them cross the road and avoid obstacles, maybe, but unless they are walking to work every day it might not be a reasonable expenditure.

The biggest obstacle that these researchers will run into is the problem of space. Unless the glasses are going to look like a virtual reality headset, there will be some issues with putting all of the technology plus power generation into a small space [1].

A SMARTPHONE app that helps disabled people across the road has gone on trial in Scotland.

A pedestrian crossing outside the Scottish Parliament has become the first in the UK to be fitted with a “Neat box”. The device allows a Smartphone user to trigger the button and then alerts them that it’s safe to cross. The invention could save lives because, depending on their disability, users may not be able to see or push the conventional crossing button. Some cannot hear or see that it is safe to cross.

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A blind person, for example, can use the Smartphone app to remotely trigger the crossing button and will then get an extra audio cue or vibration that it is safe to cross the road.

The free phone app is the brainchild of Gavin Neate, a former guide dog mobility instructor from Roslin, Midlothian. After 18 years working with visually impaired people, Mr. Neate said he wanted to create a simple aid to help them cross the road – using technology in easily accessible smart phones.

The Neat box uses “Proximity-Aware Technology” to act as a portable signal box to traffic crossings and help users safely cross busy roads [2].

IOT OPERATED WHEELCHAIR

It is implemented on a home navigation system this process is implemented on the wheelchair and takes the input of the gesture commands by the android device through Bluetooth and navigated. The device is equipped with obstacle avoidance technique the person may not be able to provide proper command at the right time. This work is having a wheelchair control which is useful to the physically disabled person by using his gesture recognition by hands using Acceleration technology [3].

II. IMPLEMENTATION

When a person (one or more) stands on a carrier and press the start button to move carrier further, It first checks the vehicle density , if the density is more it won't move the carrier further if density is less (ex: less than or equal to 5) it moves the carrier to other side of the road and comes back.

The density of the vehicle is checked using IR sensor and photodiode. Coding is done in such a way the at the entry point if the vehicle enters it starts to increment the count for each entering vehicle, at the exit point when the vehicle exit it starts to decrement the count by one for each existing vehicle. At the entry point and exit point sensor is kept which takes count of vehicles. When there are less than 5 vehicles carrier moves, if it's more than 5 until it exits it won't move the carrier, it waits and again checks the density until its less.

Sensors take analog input which is to be converted into digital and need to drive the motors, this is done using L293D.

Block Diagram:

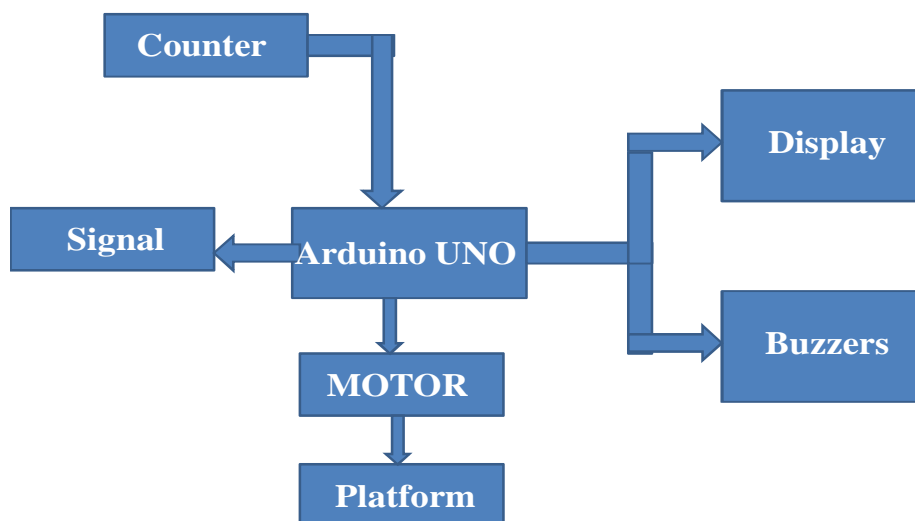


Fig.1 Block Diagram Representation

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FUNCTIONAL REQUIREMENTS:

L293D motor driver:

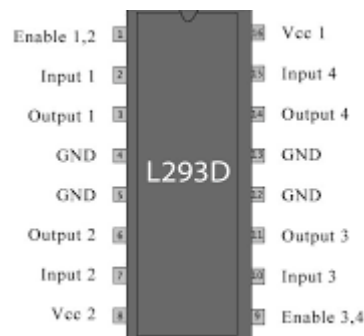


Fig.2 L293D IC

Generally, L293D motor driver can control two motors at one time or call is a dual H-Bridge motor driver. By using this IC, it can interface DC motor which can be controlled in both clockwise and counter-clockwise direction. The motor operations of two motors can be controlled by input logic at pins 2 and 7 and 10 and 15. Below shown the pin diagram of an L293D motor driver. Besides that, with this L293D driver motor, it will control four DC motors at one time but with fix direction of motion.

L293D has an output current of 600mA and peak output current of 1.2A per channel. Moreover for protection of circuit from back EMF output diode is Morever for protection of circuit from back EMF output diode is for truth table above, the Enable has to be set to 1 and motor power used is 12V but it depends on motor power that used (range 4.5V to 36V).

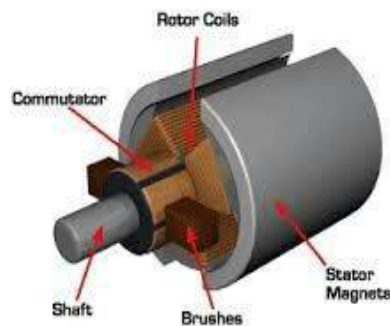


Fig.3 DC Motor

The DC motor rotation controlled by A and B in programming assembling combinations, from the truth table, the rotation of the motor is clear.

Photodiode:

A photodiode is a type of photodetector capable of converting light into either current or voltage, depending upon the mode of operation. Comparing to the semiconductor diodes the photodiodes are similar except that they may be either exposed (to detect vacuum UV or X-rays) or packaged with a window or optical fiber connection to allow light to reach the sensitive part of the device. Rather than Typical PN junction, a photodiode will use PIN junction.

Infrared LED:

Infrared LED that emits infrared rays has the same appearance with visible light LED. Its appropriate operating voltage is around 1.4v and the current is generally smaller than 20mA. Current limiting resistances are usually connected in series in the infrared LED circuits to adjust the voltages, helping the LEDs to be adapted to different operating voltages.

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LM7805 Voltage Regulator IC.

As we require a 5V we need LM7805 Voltage Regulator IC. 7805 IC Rating: Input voltage range 7V-35V.
Current rating $I_c = 1A$.

III. EXPERIMENTAL RESULTS

Road assistance system has been implemented for the safety and to avoid accidents of the physically challenged people. Firstly, using abstract sensor the density of the vehicles check on both sides of the road. Secondly, based on the density of vehicles buzzers are initiated. Thirdly, the carrier carries the people to the other side of the road. This is the efficient approach for the physically challenged people to cross the easily.

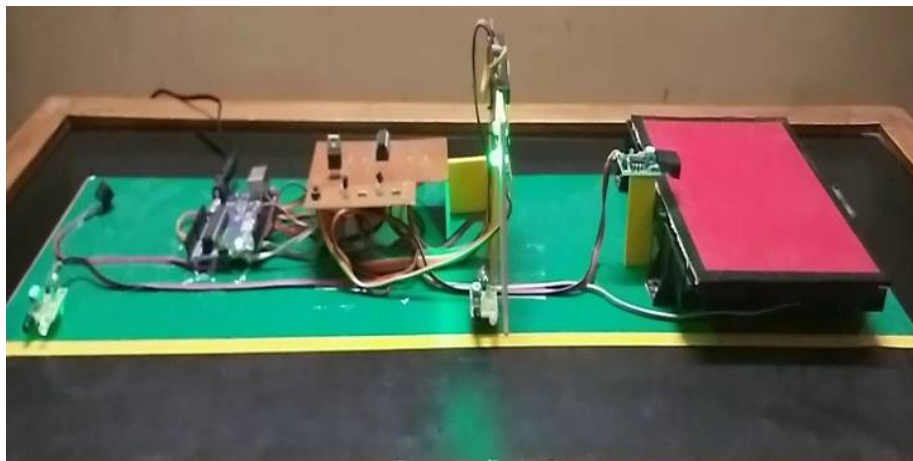


Fig.4 Prototype implementation



Fig.5 LCD Display

Further, physically challenged people need not to depend on the others for crossing the road. Te result proves the efficiency of the system and show that our approach could have good prospects for future applications.

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IV. CONCLUSION

With the help of this automated carrier, physically challenged people will be safe and easier for the road crossing and they will be self-dependent. The Present system uses the zebra crossing with the implementation of this system it will help people as well challenged people will be able to use facilities in the smart city. Future work will include the development of this system for TWO lanes.

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REFERENCES

- [1] Amrita R.Palaskar and Prof Aruna P.Phatale Rfid BasedAutomated Guided Vehicle System for Transportation International Journal of Elec- trical Engineering and Technology (IJEET), Volume 4, Issue 4, July- August (2013), pp. 56-61.
- [2] "An Investigation into Non-Verbal Sound-Based Modes of Human-to-Computer Communication with Rehabilitation Applications", Edward Burke, Yvonne Nolan & Annraoi de Paor, Adjunct Proceedings of 10th International Conference on Human-Computer Interaction, 2003.
- [3] "The Mechanomyogram as a Tool of Communication and Control for the Disabled", Yvonne Nolan & Annraoi de Paor, 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, San Francisco, CA, September 1-5 2004, pp. 4928-2931.
- [4] "The human eye position control system in a rehabilitation setting", Yvonne Nolan, Edward Burke, Claire Boylan & Annraoi de Paor, International Conference on Trends in Biomedical Engineering, September 2005.
- [5] Sourabh Savadatti, Amit Doddamani, Chetan Patil, Vijayalaxmi N Nadagouda, Sahana M Konnur "Android Controlled Automatic Jack System for Vehicles", International Journal of Innovative in Science Engineering and Technology (IJIRSET), Volume 5, Issue 6, pp. 13492-13498, July 2016
- [6] <http://www.deadlinenews.co.uk/2014/07/14/smartphone-app-helps-disabled-cross-the-road/> (Online).
- [7] <http://www.ijer.in/ijer/publication/v5si5/21.pdf> (Online).
- [8] Y.He, H.Wang,andB.Zhang,cooler based road detection in urban traffic scenes. IEEE transaction on ITS, vol.5, pp.309-318,2004.
- [9] Escalera.A, Moreno.L. E, Salichs M.A and Armingol road traffic sign detectionandclassification. IEEETrans,onindustrialelectronics.
- [10] www.geek.com/news/helping-the-blind-cross-the-road-556994 (Online).