International Journal of Engineering Applied Sciences and Technology, 2016
Vol. 1, Issue 12, ISSN No. 2455-2143, Pages 54-57
Published Online October-November 2016 in IJEAST (http://www.ijeast.com)

AUTO WORLD-AUTOMATIC TRANSPORTATION SYSTEM

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***Abstract*— Auto world is an automatic transportation system that involves developing technology for autonomous cars, mainly electric cars. This can be very useful in commercial, educational and industrial areas. The idea of the system is based on Google car. The main aim of the proposed system is based on Google car. The main aim of the proposed system is easy transportation of the employees in an industrial zone. This would help the employees to reach the destination without confusion and thus save time. For the demonstration purpose, the project uses a predetermined track of convenient dimensions and a prototype for the driverless car.**

I. INTRODUCTION

The idea of this project is from Google car which is a driverless car project by Google research department. The technology has grown tremendously that various automobile companies are investing in driverless vehicles. These vary from BMW to latest Tesla cars. Tesla motors have included a special feature in the vehicle called autopilot. Automated cars offer greater mobility to more number of people. When a person travels in an automated car he need not know driving. Machines are more accurate than humans. Therefore the number of accidents caused by automated vehicles is far less than that caused by humans. Automated vehicles are ecofriendly. Since they run on electric energy the carbon emission will get reduced considerably.

The main objective of this project is to propose a transportation system that offers safe transportation of people to the desired location. With the introduction of this traffic system deaths from road accidents can be reduced.

The old and aged people as well as physically handicapped people can use this transportation system to reach their destination without difficulty. Auto world can be implemented in a closed area like government complex, hospitals, IT parks etc.

II. PROPOSED ALGORITHM

The destination is entered through keypad. Once the destination is chosen the vehicle approaches the first junction. On reaching the junction, the vehicle stops and read the particular value of RF tag placed beneath the first junction. Then the vehicle request for information from control section. The control section chooses appropriate path based on traffic intensity and then send this information to vehicle.

Once the path is identified, the vehicle starts to move in that direction. It changes the direction of travel at the turnings by reading the RFID tag value. This procedure is followed at all the turnings. On reaching the destination, the vehicle will stop by identifying the tag value placed in the destination.

A. **Control Section –**

The control section begins action on receiving command from the motor section. Once the command is received to the PIC A via zigbee from the motor section, the IR transmitter receiver part will come into play. The PIC A instructs the IR section on both the paths to check the traffic intensity. This part of the circuit checks for the traffic intensity at all the path. Obstacle detection principle is used for analyzing the traffic intensity. Now the route is selected. Once the path with less traffic is identified this route status is send to PIC B (on the motor section) sends this information (yes/no) to the motor section via zigbee module. The process stops after sending information to PIC B. This process will take place in the same manner when the control section receives command from the motor section.

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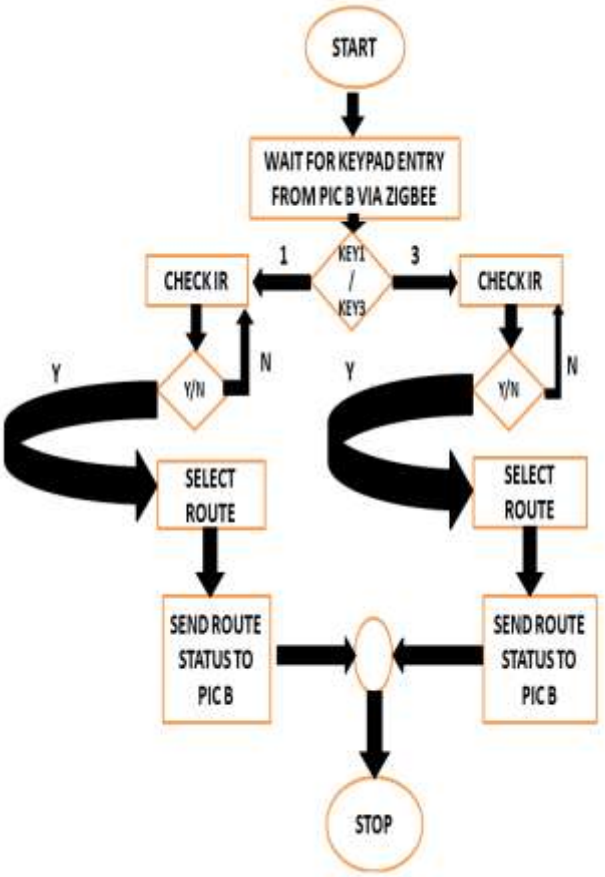

Fig. 1. Flowchart - Control Section

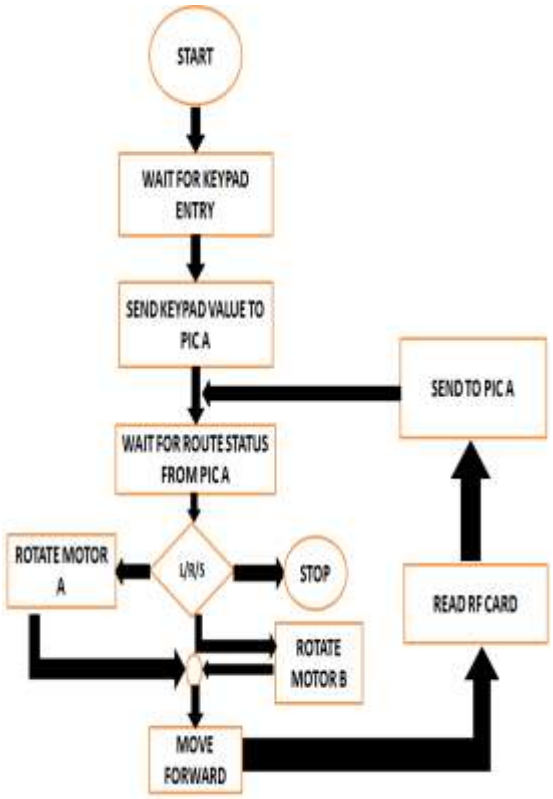

Fig. 2. Flowchart - Motor Section

B. Motor Section –

The destination is entered through the keypad. Hence it waits for the keypad entry initially. This keypad value is send to PIC A. Once the destination is chosen the vehicle approaches towards the first junction. Once the vehicle stops, it chooses appropriate path by checking the traffic on both paths. This happens when the PIC A instructs the control section to check for the traffic intensity on both paths. The control section PIC B decides on the appropriate path. Hence motor section waits for route status from PIC B.

Once the path is identified, the vehicle starts to move in the left/right direction or it stops accordingly. The motors are rotated in specific directions depending on the direction of path chosen. It changes the direction of travel at the turnings by reading the RF tag value at the turnings. This procedure is followed at all turnings. On reaching the destination, the vehicle will stop by identifying the tag value placed in the destination. The user can again enter destination from the same point also. In all cases, the same procedure is repeated.

III. Experiment and Result

The heart of the project consist a predesigned track, motor section and the control section. This project uses a predetermined track for the purpose of demonstration. The control section covers the following details; it consists of IR transmitter receiver pairs on the either side of track to check the density of traffic around those specific junctions. It also consists of **RFID cards** [1] placed beneath the track which helps the car to take decisions about the direction of travel. The motor section is mobile unit of the project. It is a car which includes a keypad for entering the destination. Upon entering the destination, the car chooses a path depending on the traffic intensity to reach the destination.
The hardware requirement was to have a platform to run the car. There are three major sections from the project design standpoint: track, motor section, control section.

A. Track Design –

The track which represents a particular commercial zone is constructed using plywood. Two separate layers of wood were used. The upper layer consists of RFID cards placed beneath them at each turning. This helps the car to decide on the directions to be followed during the journey. The track also has slots to accommodate the IR transmitter receiver pairs on the either side of the track. A space is provided between the two plywood sections to accommodate the circuit for control

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section.

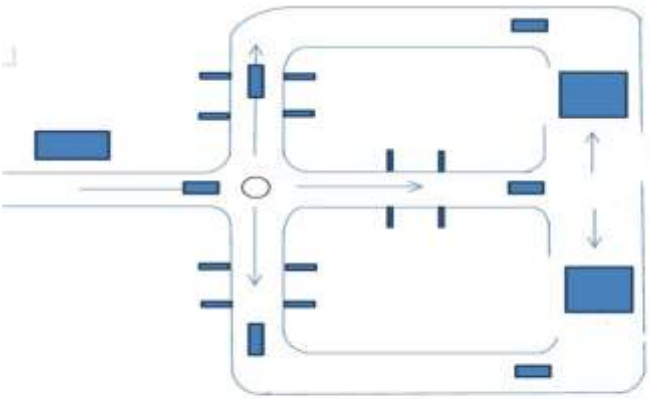

Fig.3. Track

Figure 1 shows the track design. Large rectangular boxes represent starting and destination points. For demonstration purpose starting point is assigned as2. The destination building is marked as 1 and 3. Keypad is provided along with the car which is a part of motor section. Six pairs of transmitter receiver pairs are placed on the tracks along three different paths. Six RFID cards are also placed beneath the first layer of track.

B. Control Section –

The control section includes IR transmitter receiver pairs, RFID cards, PIC16F877A, Max232 and Zigbee module. The Infrared (IR) transmitter and receivers [2] are used to detect obstacles. They are used in wide variety of electronic devices. Here we provide a black tape coating on IR transmitter receiver pair to focus the IR beam.

C. Motor Section –

The heart of the motor section is the vehicle which is used to reach the destination. The vehicle accommodates the necessary circuitry required for the motor section. The important components used in this section are rectifier circuitry, PIC16F877A, MAX232, DB9 connector, Zigbee module, dc geared motor, L293D motor driver IC and the keypad which is used to enter the destination.

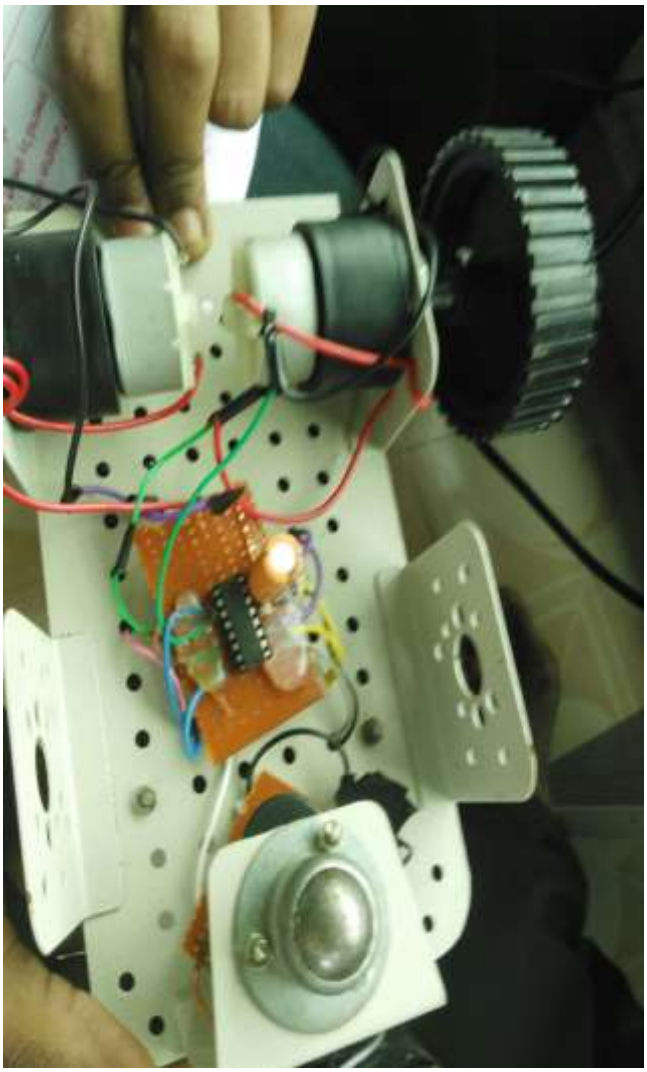

Fig.4. Motor Section

The power required for the circuit comes from a 12V dc adapter. The rectifier [3] circuitry accommodates a bridge rectifier IC, capacitors for smoothening ripples in the dc output of the rectifier IC and a 7805 regulator.

The main component of circuitry is the PIC16F877A. The PIC takes all the necessary decisions depending on the conditions. MAX232 is used to convert RS232 to TTL logic level.DB9 connector is used in which only 3 pins are used; transmit, receive and ground pins. The vehicle moves with the help of dc geared motors which are driven by the **motor driver** [4] IC L239D.Zigbee module is used for communication with the control section.

The IR LED was adjusted many times to achieve optimum obstacle detection. The placing of IR LED in tiny slots was a difficult task. Another challenge was to adjust the delay of

motor rotation. The delay was adjusted several times for the vehicle to move in real time track. LED lights were used in motor section and control section to interpret the sequence of implementation of instructions.

IV. CONCLUSION

The proposed system is an easy and safe transportation model. It can be employed in commercial areas. In order to demonstrate our system, we developed an automatic vehicle. The layout of track which consists of various paths and buildings resembling a commercial zone should be known in advance. The auto-world is intended to improve the quality of transportation in such a way by decreasing the number of accidents and traffic congestion. It ensures perfect timing transportation. Since the acceleration and speed of all cars in the system are same, there will be no overtaking.

V. REFERENCE

[1] Weis, Stephen A. (2007), RFID (Radio Frequency Identification):Principles and Applications, MIT CSAIL.

[2] Liew S. C. "Electromagnetic Waves". Centre for Remote Imaging, Sensing and Processing

[3] Williams, B.W. (1992). "Chapter 11". Power electronics; devices, drivers and applications (2nd ed.). Basingstoke: Macmillan.

[4] Campbell, Sylvester J.(1987). Solid-State AC Motor Controls .New York: Marcel Dekker, Inc.

[5] Daniel M. Dobkin The RF in RFID: Passive UHF RFID In Practice, Newnes, chapter 8.