INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X
Impact factor: 4.295
(Volume 5, Issue 3)
Available online at: www.ijariit.com

Detection of illegally parked vehicle

Rishu Suman
rishusuman91@gmail.com
S. J. C. Institute of Technology, Chikkaballapur, Karnataka

Prashant Kumar
prash1720@gmail.com
S. J. C. Institute of Technology, Chikkaballapur, Karnataka

Rohit Kumar
imrohitkumar7@gmail.com
S. J. C. Institute of Technology, Chikkaballapur, Karnataka

Swetha T.
swetha102reddy@gmail.com
S. J. C. Institute of Technology, Chikkaballapur, Karnataka

ABSTRACT

Detecting an illegally parked vehicle aims to prevent car crashing between parked and other vehicles. The main objective of this paper is to identify the unauthorized parker who was parked in the private property and notify those owners. Here in this Radio Detection and Ranging (RADAR) systems, electromagnetic waves can recognize the speed, range, altitude or direction of objects, either fixed or in motion. This system consists of Arduino microcontroller, ultra-sonic sensor, servo motor, and some java applications to map the electromagnetic waves. This system can be built by connecting the ultrasonic sensors to the Arduino microcontroller's input/output pins and servo motor is also connected to the Arduino microcontroller pins. Then both ultrasonic sensor and servo motor are clipped over the Arduino microcontroller together so that servo motor can rotate from right to left through an angle of 180. This experiment results show that the proposed framework is efficient and robust to detect an illegally parked vehicle.

Keywords— *Arduino, Ultrasonic sensor, Illegal parking, RADAR system*

1. INTRODUCTION

The parking violation is the act of parking the vehicle in the unauthorized place or parking in a restricted area. In our project detection of illegally parked vehicles system provides such a feature like a security management system, it will also notify the owner if there is a vehicle parked illegally in his area. This also helps the society to have an organized parking space around the area. Especially in the metropolitan area, there is a problem because of the increase in cars and the decrease in the amount of free space. The system consists of an ultrasonic sensor, an Arduino micro-controller, a servo motor and a java application for mapping the electromagnetic waves. A prototype system is built by connecting the ultrasonic sensors to the Arduino microcontroller's digital input/output pins and the servo motor also connected to the digital input/output pins. Both the ultrasonic sensor and the servo motor are then clipped together so that as the servo motor sweeps from right to left through an angle of 180· the servo will rotate alongside it. An ultrasonic detector usually consists of a transducer to convert electrical signals to sound waves and vice-versa. These have been applied in object detection and identification systems, measuring the orientation and position of objects, collision avoidance systems, surveillance, flow measurement and material type detection. Ultra-sonic technology is commonly used for range finding. When the pulse of ultrasound is generated and directed at a particular direction and if there is an object in the path of this sound, it gets reflected back to its source and then by measuring the time difference between the pulse transmission and reception, it is possible to determine the distance of the object. Typical usage of this method is echolocation by bats source and by measuring the time difference between the pulse transmission and reception, it is possible to determine the distance of the object. Typical usage of this method is echolocation by bats.

2. DESCRIPTION

The illegal vehicle detection system is a technique in which one can detect if there are any illegally parked vehicles in that particular area. The technology can be implemented using the ultrasonic sensor. The components that are generally used here is as follows:

(a) Arduino UNO module
(b) Servo motor
(c) Ultrasonic sensor HC-SR04 module

The description of the device is given below.

3. COMPONENTS REQUIRED

3.1 Arduino Uno

Arduino Uno is a microcontroller board. It is based on the ATmega328 which is a datasheet. There are several pins on the board, such as:

- 14 digital input/output pins (of which 6 are PWM pins).
- 6 analogue inputs.

Apart from these pins they contain a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, And a reset button. Pin number 13 of the analogue inputs contains the internal resistance.

© 2019, www.IJARIIT.com All Rights Reserved

Fig. 1: Arduino Uno module

3.2 Servo motor module

The servo motor is an assembly of four things: a normal DC motor, a gear reduction unit, a position-sensing device and a control circuit. The DC motor is connected with a gear mechanism which provides feedback to a position sensor. From the gearbox, the output of the motor is delivered via servo spline to the servo pilot. It consists of three wires- a black wire connected to ground, a white/yellow wire connected to the control unit and a red wire connected to the power supply. It can also be used in many ways from helping your robots walk, to moving remote-controlled boats, or cars.

Fig. 2: Servo motor module

3.3 Ultrasonic Sensor HC-SR04 module

The ultrasonic sensor uses sonar to determine the distance to an object like bats do. It offers excellent non-contact range detection with high accuracy. It comes with an ultrasonic transmitter and receiver modules. It has a range from 2 cm to 400 cm or 1" to 13 feet. The ultrasonic sensor is a 4-pin module which is Vcc, Trigger, Echo and Ground respectively.

Fig. 3: Ultrasonic sensor HC-SR04 module

4. CONNECTION FLOWCHART

The hardware system comprises of three distinct components namely, an Arduino micro-controller, a servo motor and an ultrasonic sensor. The ultrasonic sensor is mounted on the servo-motor to provide a turning mechanism. Both the ultrasonic sensor and the servo motor are in turn powered and controlled by the Arduino micro-controller.

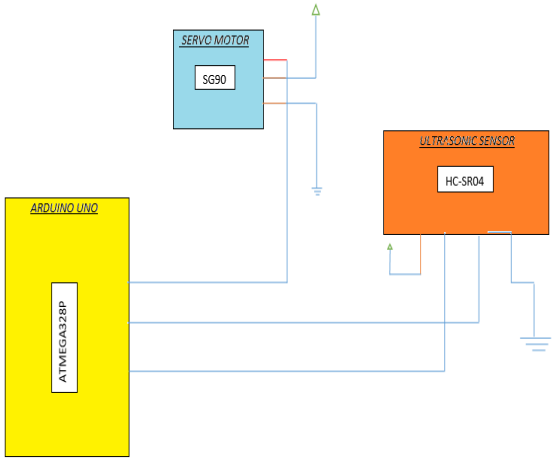

Fig. 4: Block diagram

Here, the ultrasonic sensor detects an object that comes in contact with it, which activates the buzzer. Which can alert the owner about the incident? This data is also fed into a Processing IDE software, which creates a graphical map on a screen.

5. FLOW CHART

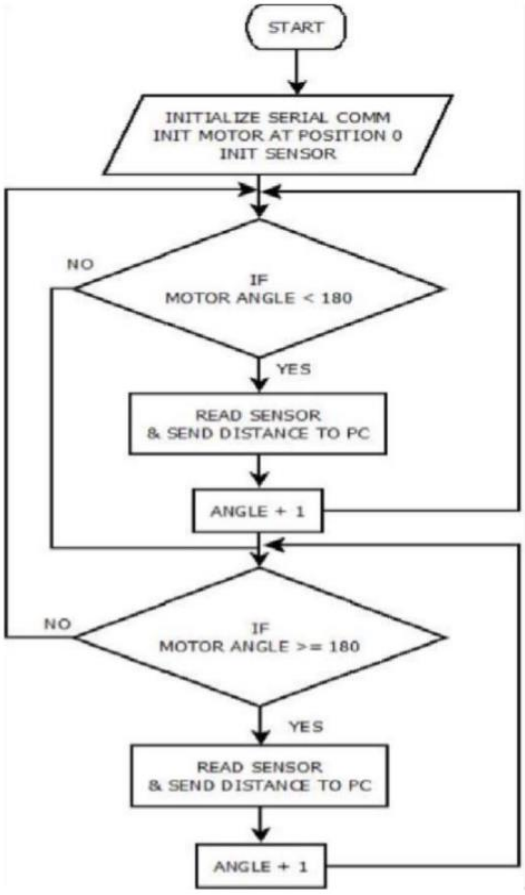

Fig. 5: Flow chart

If the motor angle is less than 180° and if an object is detected within that range, then the sensor reads the object's distance and send it to the Arduino micro-controller. The motor will keep rotating with the increase in the angle of 1° until it finds an object. If the object is not found in the given range of angle then the sensor will search for the object where the angle of the motor will be either more than 180° or equal to 180°. If the object is found in that range then it will send the distance of that object to the Arduino micro-controller and if the object is not found then the motor angle will get decreased with the angle of 1° and the cycle will repeat again till the object is found.

© 2019, www.IJARIIT.com All Rights Reserved

6. SYSTEM CIRCUIT DESIGN

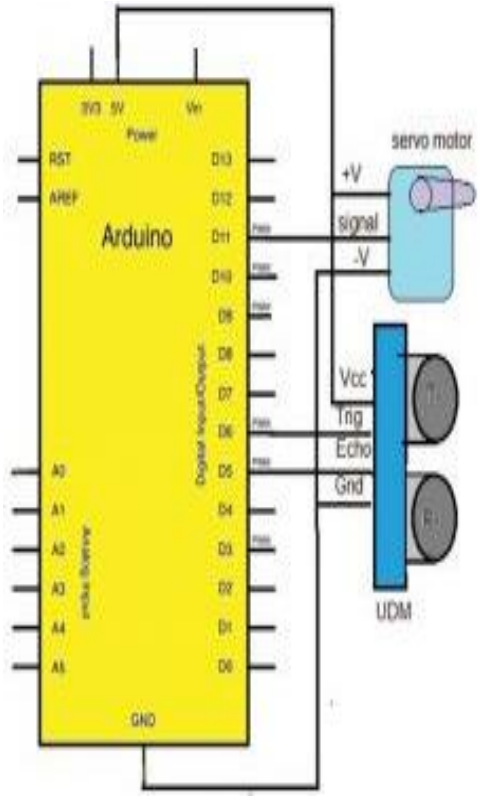

Fig. 6: Circuit diagram

7. CONCLUSION

Because of the necessity of vehicle control, traffic surveillance systems are improved by the use of IoT. The developed system was able to read the distance of obstacles and the angle of incident and convert this data into visually represented information. This system will mainly be used in the area of illegally parked vehicle detection and notify the owner about this incident. These systems can counter the parking problems that arise due to the unavailability of a reliable, efficient and modern Parking system. It also helps in preserving the environment, fuel and time along with economic, social and safety-based aspects of the society.

8. REFERENCES

[1] G. Bhor, P. Bhandari, R. Ghodekar and S. Deshmukh, "Mini-Radar," International Journal of Technical Research and Applications, pp. 68-71, 2016.

[2] D. B. Kadam, Y. B. Patil, K. V. Chougale and. S. S. Perdeshi, "Arduino Based Moving Radar System," International Journal of Innovative Studies in Sciences and Engineering Technology (IJISSET), vol. 3, no. 4, pp. 23-27, 2017.

[3] T. P. Rajan, K. K. Jithin, K. S. Hareesh, C. A. Habeeburahman and. A. Jithin, "Range Detection based on Ultrasonic Principle," International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, vol. 3, no. 2, pp. 7638-7643, 2014

[4] P. S. Abhay, S. K. Akhilesh, P. Amrit and Kriti, "A Review on Ultrasonic Radar Sensor for a Security system," Journal of Emerging Technologies and Innovative Research (JETIR), pp. 137-140, 2016.

[5] O. V. Amondi, "Collision Avoidance System," The University Of Nairobi, 2009

[6] Shamsul A., Tajrian M., "Design of an Ultrasonic Distance Meter", International Journal of Scientific and Engineering Research, pp. 1-10, March 2013.

[7] Abbay P., Akhilesh S., Amrit P., and Prof Kriti, "A Review on Ultrasonic Radar Sensor for Security system", Journal of Emerging Technologies and Innovative Research (JETIR), April 2016.

[8] Babu Varghese, "Collision Avoidance System in Heavy Traffic and Blind spot Assist Using Ultrasonic Sensor", International Journal of Computer Science and Engineering Communications-IJCSEC. Vol. 2, Issue 1, February 2014 ISSN: 2347-8586

[9] Ahman Emmanuel Onoja, Abdusalaam Maryam Oluwadamilola, Lukman Adewale AJAO "Embedded System Based Radio Detection and Ranging (RADAR) System Using Arduino and Ultra-Sonic Sensor" American Journal of Embedded Systems and Applications 2017; 5(1): 7-12.

© 2019, www.IJARIIT.com All Rights Reserved