Obstacle Avoiding Robotic Vehicle with Eye Blink Sensor

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Abstract*: In today's world ROBOTICS is a fast growing and interesting field. ROBOT has sufficient intelligence to cover the maximum area of provided space. Introduces the design and implementation of an autonomous obstacle -avoiding robot car using ultrasonic wave sensor in this thesis. By sending pulses, the obstacle avoidance distance can be measured. At the same time, we can control steering gear to realize the obstacle avoidance function. The robot car uses front axle steering, rear wheel drive arrangement. Two drive tires are driven by two DC motors with gear reduction mechanisms. Using Arduino MCU chip as the control core of the Robot car. Through the design of the hardware and software system, we build the robot car platform and obtain good experimental effect.*

This project describes about an obstacle avoidance robot vehicle which is controlled by sensor. The robot is made using ultrasonic sensor and it is controlled by Arduino microcontroller. Ultrasonic sensor fixed in front portion of the robot vehicle. The sensor gets the data from surrounding area through mounted sensors on the robot. The sensor is sensing the obstacle and deviate its path to choose an obstacle free path. The sensor will be sending the data to the controller is compared with controller to decide the movement of the robot Wheel. The robot wheel movement and direction will be based on the sensing of the ultrasonic sensor and also using a wheel encoder. This vehicle is used for detecting obstacle and avoiding the collision. We have programmed the controller to be used with ANDROID app.

An ultrasonic sensor is used to detect any obstacle ahead of it and sends a command to the micro-Alternates direction by actuating the motors which are interfaced to it through a motor driver. Obstacle avoidance is one of the most important aspects of mobile robotics. Without it, robot Movement would be very restrictive and fragile. This project proposes robotic vehicle that has an intelligence built in it such that it directs itself whenever an obstacle comes in its path.

Accidents due to driver drowsiness can be prevented using eye blink sensors. The driver is supposed to wear the eye blink sensor frame throughout the course of driving and blink has to be for a couple of seconds to detect drowsiness. Any random changes in steering movement leads to reduction in wheel speed. The threshold of the vibration sensor can be varied and accordingly action can be taken

Keywords: ROBOTICS

REFERENCES

[1] MarcoJavier Flores, JoséMaría Armingol and Arturo de la Escalera, Driver Drowsiness Warning System Using Visual Information for Both Diurnal and Nocturnal Illumination Conditions‖, Springer, EURASIP Journal on Advances in Signal Processing, 2010.

[2] Belhassen AkroutWalid Mahdi, ―A Blinking Measurement Method for Driver DrowsinessDetection‖, Springer, Proceedings of the 8th International Conference on Computer Recognition Systems CORES, pp 651-660, 2013.

[3] Ji Hyun Yang, Zhi-Hong Mao, Member, IEEE, Louis Tijerina, Tom Pilutti, Joseph F. Coughlin, and Eric Feron, ―Detection of Driver Fatigue Caused by Sleep Deprivation‖,IEEE TRANSACTIONS ON SYSTEMS, MAN, AND CYBERNETICS―PART A: SYSTEMS AND HUMANS, VOL. 39, NO. 4, JULY 2009.

[4] Antoine Picot, Sylvie Charbonnier, Alice Caplier, ―On-Line Detection of Drowsiness Using Brain and Visual Information‖,Published in: IEEE Transactions on Systems, Man, and Cybernetics - Part A: Systems and Humans (Volume: 42, Issue: 3) Page(s): 764 – 775, May 2012.

[5] Satori Hachisuka, Kenji Ishida, Takeshi Enya, Masayoshi Kamijo, ―Facial Expression Measurement for Detecting Driver Drowsiness‖ , springer, International Conference on Engineering Psychology and Cognitive Ergonomics. EPCE 2011: Engineering Psychology and Cognitive Ergonomics pp 135-144, 2011.

[6] Ines Teyeb, Olfa Jemai, Mourad Zaied, Chokri Ben Amar, ―A Drowsy Driver Detection System Based on a New Method of Head Posture Estimation‖ , springer. International Conference on Intelligent Data Engineering and Automated Learning. IDEAL 2014: Intelligent Data Engineering and Automated Learning –IDEAL 2014 pp 362-369, 2014.

[7] M Nasucha, "Development of an Obstacle Avoiding Robot ", Microcontroller Lab, Univ. Pembangunan Jaya, Tangerang Selatan, Indonesia, 2015.

[7] Khine Myint Mon, The Thae Ei Aung, Hnin Ngwe Yee Pwint , "Automatic Obstacle Avoidance Robot Vehicle", IJCIRAS1342, vol. 2, pp. 112-115, 2019.

[8] R. Gowtham, "Obstacle Detection and Avoidance Methods for Autonomous Mobile Robot", International Journal of Science and Research,vol. 5, pp. 1245-1249,January, 2016.

[9] Kolapo Sulaiman Alli, Moses Oluwafemi Onibonoje, Michael Adigoke Ogunlade,Sameul Olushola Dada, "Development of an Arduino-Based Obstacle Avoidance Robotics System for an Unarmed Vehicle", APRN journal of Engineering and Applied Sciences, vol. 13, no.3, pp.