

Design and Fabrication of Multi Indication System in Two Wheeler for Avoiding Accident

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Abstract: - Road accidents often happen when vehicles come very close and the drivers sleep or not aware of the vehicles coming close. This may happen while in traffic or when driving with high speed and cross each other on road. Here we presents a method using ultrasonic sound sensor technology that will recognize and indicate using buzzer about the vehicles that approach the vehicle on two sides within a meters range and alert the driver. Thus while the driver is alerted about the vehicles that come very close in his vicinity, accidents can be better avoided.

Key Words:- Ultrasonic Sensor, Battery, Microcontroller 16F877 I/P, LED, Buzzer.

INTRODUCTION

Driving is a compulsory activity for most people. People use their bike to move from one place to other place. The number of vehicle is increasing day by day. It is produced tacked tightly and risk to accident. Nowadays, the numbers of accident is so high and uncertainly. Accident will occurs every time and everywhere and cause worst damage, serious injury and dead. In this work we are Using ultrasonic as a ranging sensor, its function based on ultrasonic wave. After transmit by transmitter, the wave can reflect when obstacle detected and receive by receiver. In the presence of vehicle the sensor senses the vehicle; the light will glow at the other end of the curve. In the absense of the vehicle the sensor will not sense and the light will not glow. This process repeats continuously. In 2011, a question was submitted to the European Commission regarding stimulation of these "collision mitigation by braking" systems.[2] The mandatory fitting of Advanced Emergency Braking Systems in commercial vehicles will be implemented on 1 November 2013 for new vehicle types and on 1 November 2015 for all new vehicles in the European Union. This could, according to the impact assessment, ultimately prevent around 5,000 fatalities and 50,000 serious injuries per year across the EU. In an important 2012 study by the nonprofit research organization Insurance Institute for Highway Safety, researchers examined how particular features of crash-avoidance systems affected the number of claims under various forms of insurance coverage. They found that two crash-avoidance features provide the biggest benefits:(a)

autonomous braking that would brake on its own, if the driver does not, to avoid a forward collision, and(b) adaptive headlights that would shift the headlights in the direction the driver steers. Unexpectedly, they found lane departure systems to be not helpful, and perhaps harmful, at the circa 2012 stage of development.

COMPONENDS DESCRIPTION

PIC MICROCONTROLLER

A microcontroller is a computer control system on a single chip. It has many electronic circuits built into it, which can decode written instructions and convert them to electrical signals. The microcontroller will then step through these instructions and execute them one by one. As an example of this a microcontroller we can use it to controller the lighting of a street by using the exact procedures. Microcontrollers are now changing electronic designs. Instead of hard wiring a number of logic gates together to perform some function we now use instructions to wire the gates electronically. The list of these instructions given to the microcontroller is called a program. There are different types of microcontroller, this work focus only on the PIC16F877A Microcontroller where it's pins as shown in below Figure.1

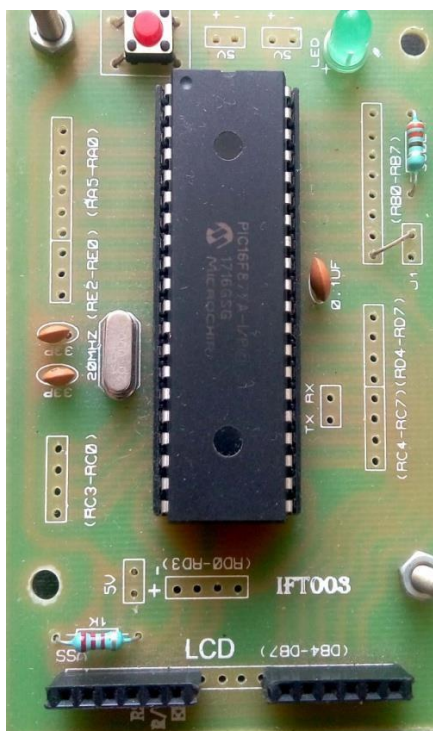


Fig.1

INTRODUCTION

PIC MICROCONTROLLER

The high performance of the PICmicro devices can be attributed to a number of architectural features commonly found in RISC microprocessors. These include:

- Harvard architecture
- Long Word Instructions
- Single Word Instructions
- Single Cycle Instructions
- Instruction Pipelining
- Reduced Instruction Set
- Register File Architecture
- Orthogonal (Symmetric) Instructions

Figure shows a simple core memory bus arrangement for Mid-Range MCU devices.

HARVARD ARCHITECTURE:

Harvard architecture has the program memory and data memory as separate memories and is accessed from separate buses. This improves bandwidth over traditional von Neumann architecture in which program and data are fetched from the same memory using the same bus. To execute an instruction, a von Neumann machine must make one or more (generally more) accesses across the 8-bit bus to fetch the instruction. Then data may need to be fetched, operated on, and possibly written. As can be seen from this description, that bus can be extremely congested. While with Harvard architecture, the instruction is fetched in a single instruction cycle (all 14-bits). While the program memory is being accessed, the

data memory is on an independent bus and can be read and written. These separated buses allow one instruction to execute while the next instruction is fetched. A comparison of Harvard vs. Von-Neumann architectures is shown in Figure.

HARVARD VS VON-NEUMANN BLOCK ARCHITECTURES:

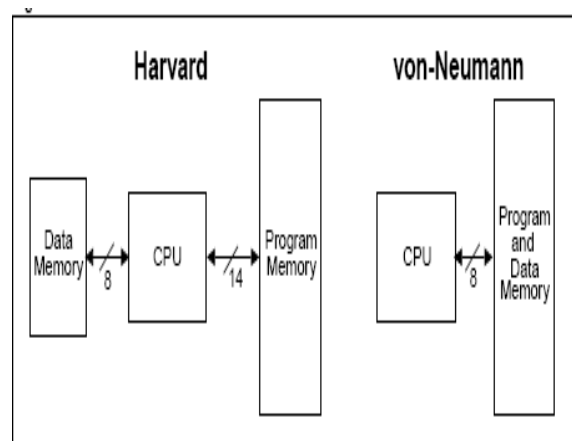


Fig.2

PRINCIPLE:

Ultrasonic sensors emit short, high-frequency sound pulses at regular intervals. These propagate in the air at the velocity of sound. If they strike an object, then they are reflected back as echo signals to the sensor, which itself computes the distance to the target based on the time-span between emitting the signal and receiving the echo.

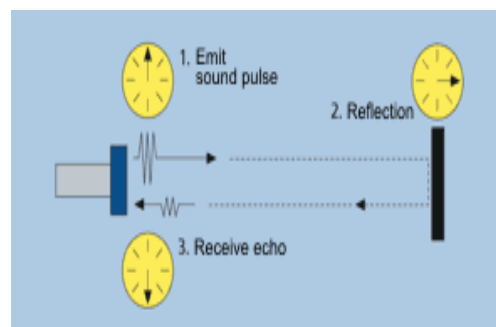


Fig .3 Ultrasonic principle

As the distance to an object is determined by measuring the time of flight and not by the intensity of the sound, ultrasonic sensors are excellent at suppressing background interference. Virtually all materials which reflect sound can be detected, regardless of their color. Even transparent materials or thin foils represent no problem for an ultrasonic sensor. Microsonic ultrasonic sensors are suitable for target distances from 20 mm to 10 m and as they measure the time of flight they can ascertain a measurement with pinpoint accuracy. Some of our sensors can even resolve the signal to an accuracy of 0.025 mm. Ultrasonic sensors can see through dust-laden air and ink mists. Even thin deposits on the sensor membrane do

not impair its function. Sensors with a blind zone of only 20 mm and an extremely thin beam spread are making entirely new applications possible today: Fill level measurement in wells of micro titer plates and test tubes, as well as the detection of small bottles in the packaging industry, can be implemented with ease. Even thin wires are reliably detected

BUZZER:

Passive Electromagnetic buzzer working principle is through the exchange of signals around the stent on the line in support of the package have a core pillar of the alternating magnetic flux, and flux of alternating magnetic ring constant flux for overlay, so that Mo Tablets given to the exchange of signals with the frequency of vibration and sound cavity. Products throughout the frequency and sound pressure response curve with the value gap, molybdenum natural vibration frequency of on-chip (refraction can be rough for small film thickness of molybdenum), Shell (Helmholtz resonance Tune) frequency of the magnetic ring magnetometer Wire Is directly related to the diameter.

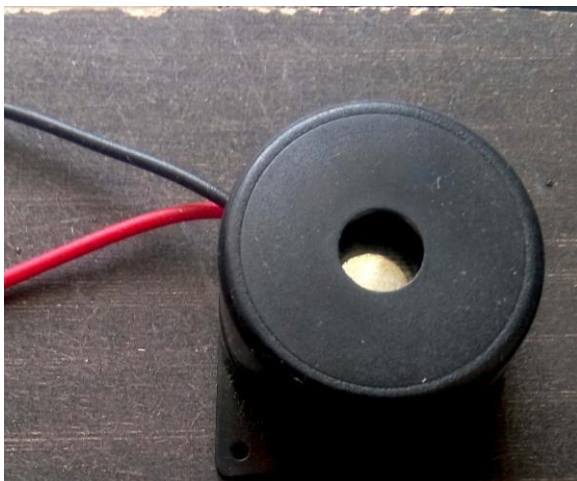


Fig.4 Buzzer

Piezoelectric film buzz is very high- pressure after the piezoelectric ceramics adhesive vibration in the metal-on-chip. When the AC voltage added, because of piezoelectric effect, and the generation of mechanical stretching deformation and shrinkage of the use of the properties of metal so that the vibration and sound1, peripheral support – will buzz film at the outer edge of fixed-cavity resonance, not to adopt the general feedback buzzer-on-chip, and its buzzer with film resonator with frequency, there will be a higher sound pressure output By an external circuit to generate promote the oscillation signal, so that the buzzer sounds. Node support – will be fixed on the buzz about films with the ceramic piece with a diameter the size of the ring structure. If properly designed cavity, and with the correct frequency of feedback-film buzz with the feedback circuit is, will be

able to generate higher sound pressure and the right frequency.

METHODOLOGY

BLOCK DIAGRAM

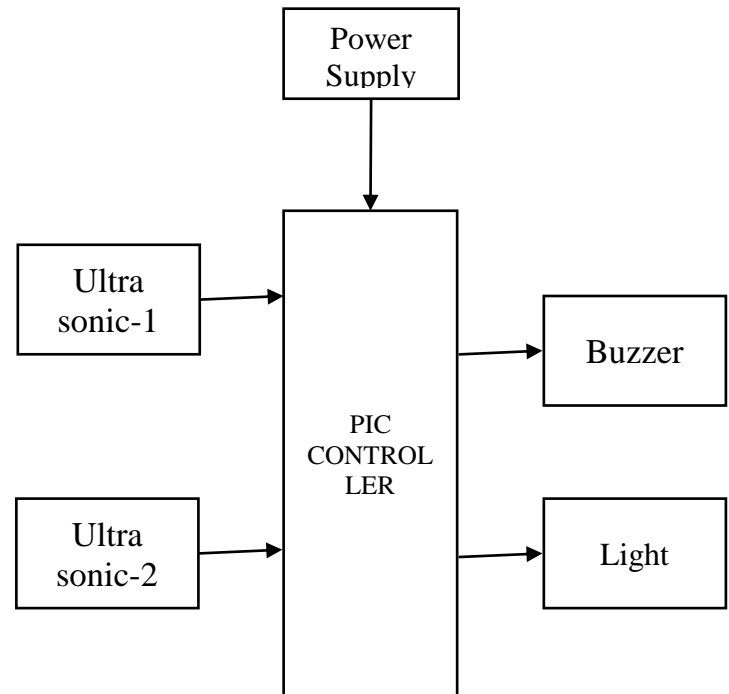


Fig.5

POWER SUPPLY:

A power supply is an electronic device that supplies electric energy to an electrical load. The primary function of a power supply is to convert one form of electrical energy to another and, as a result, power supplies are sometimes referred to as electric power converters. Some power supplies are discrete, stand-alone devices, whereas others are built into larger devices along with their loads. Examples of the latter include power supplies found in desktop computers and consumer electronics devices.

Every power supply must obtain the energy it supplies to its load, as well as any energy it consumes while performing that task, from an energy source. Depending on its design, a power supply may obtain energy from various types of energy sources, including electrical energy transmission systems, energy storage devices such as a batteries and fuel cells, electromechanical systems such as generators and alternators, solar power converters, or another power supply.

All power supplies have a power input, which receives energy from the energy source, and a power output that delivers energy to the load. In most power supplies the power input and output consist of electrical connectors or hardwired circuit connections, though some power supplies employ wireless energy transfer in lieu of galvanic connections for the power input or output. Some power supplies have other types of inputs and outputs as well, for functions such as external monitoring and

control.

Ultrasonic Obstacle Detection

Ultrasonic sensors are used to detect the presence of targets and to measure the distance to targets in many robotized processing plants and process plants. Sensors with an ON or OFF digital output are available for detecting the presence of objects and sensors with an analog output which changes relatively to the sensor to target separation distance are commercially available.

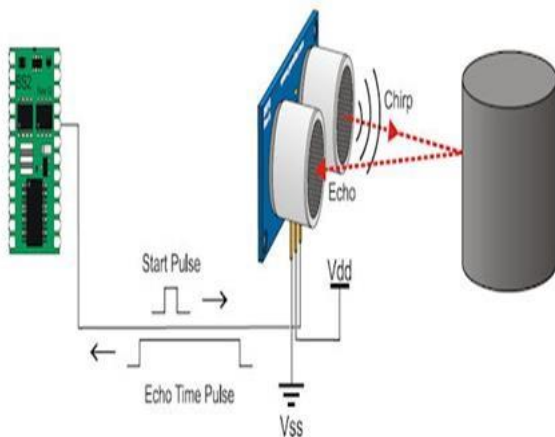


Fig.6

Ultrasonic obstacle sensor consists of a set of ultrasonic receiver and transmitter which operate at the same frequency. The point when the something moves in the zone secured the circuit's fine offset is aggravated and the buzzer/alarm is triggered.

APPLICATION:

- Liquid level control/Monitoring On Water Depth Sensing with Ultrasonic and Wastewater Management
- Trash Level Monitoring for more on sensing trash level.
- Uses in production lines on factory automation.
- Vehicle detection for car washes, automotive assembly, and parking garage application on smart parking

LITERATURE SURVEY

1. Accidents happen — and they also kill enough people to rank as the No. 1 cause of death for those ages 1 to 42, according to the National Safety Council[3]. Accidents are the fifth-leading cause of death across all age groups, topped only by a spate of illnesses that include heart disease and cancer. And it's not the heavy- machinery operators, high-rise

window washers or electricians who most frequently succumb to fatal accidents. The vast majority of accidental deaths happen at home or in the community not at work with the top five causes often stemming from routine activities.

CONCLUSION:

Accident avoidance system is usually more complex than we have demonstrated. But the complex systems while providing with some advantages often costs high and needs delicate hardware. The system which we have introduced here is more than enough for avoiding usual situation. For different situation the design may prove a bit less useful but at the same time if we consider the trade off this system is very handy to set up and is very cheap compared to the tradition accident avoidance systems. We believe that with the improved set of algorithm and hardware implementation this system may prove blessings for mass people who do not afford to buy automatic vehicles.

REFERENCES

- [1] Bella, F. and Russo, R. A Collision Warning System for rear-end collision: a driving simulator study. *Procedia-Social and Behavioral Science*, 2011, 676-686.
- [2] Experimental Characterization of Polaroid Ultrasonic Sensors in Single and Phased Array Configuration Alex Cao* and Johann Borenstein** The University of Michigan, Department of Mechanical Engineering
- [3] Cognitive efficiency in robot control by Emotiv EPOC Chowdhury, P. ; Sch. of Eng. &Comput. Sci., BRAC Univ., Dhaka, Bangladesh ; KibriaShakim, S.S. ; Karim, M.R. ; Rhaman, M.K.
- [4] Agricultural Machinery Safety Alert System Using Ultrasonic Sensors L. Guo, Q. Zhang, S. Han T. Yagi, Y. Kuno, Y. Uchikawa, "Prediction of eye movements from EEG," *Proceedings of the 6th International Conference on Neural Information Processing (ICONIP'99)*, Perth Austria, 16-20, pp. 1127- 1131, Nov 1999.
- [5] Global Integration of Ultrasonic Sensors Information in Mobile Robot Localization L. Moreno, J. M. Armingol, A. de la Escalera and M. A. Salichs Universidad Carlos III de Madrid,
- [6] Kedareswar, P.S. and Krishnamoorthy, V. A CAN protocol based embedded system to avoid rear-end collision of vehicles. *IEEE International Conference on Signal Processing, Informatics, Communication and Energy Systems (SPICES)*, 2015, 1-5.
- [7] http://nidm.gov.in/idmc2/pdf/presentations/road_accidents/pres4.pdf
- [8] http://www.volvotrucks.com/sitecollectionDocuments/vtc/corporate/values/art%20report%202013_150dpi.pdf
- [9] Milanés, V., Pérez, J., Godoy, J. and Onieva, E.A fuzzy aid rear-end collision warning/avoidance system. *Expert Systems with Applications* 39 (10) (2012) 9097-9107.
- [10] ARM micro controller MBED website. <https://mbed.org/>
- [11] Triveni Shinde and B. V. Pawar, —Car anti-collision and intercommunication system using communication protocol, *International journal of engineering sciences and research technology* ISSN:2319-7064, Volume-2, No-6, pp.187-191, June-2013
- [12] S. Saravanan, T. Kavitha, —Vehicle navigation and obstacle detection system using RFID and GSM, *Journal of Theoretical and Applied Information Technology*, Vol. 38, No- 2, pp.206-209, 30th April 2012
- [13] N . S. Vaidya and A . V .Nikalje, —Arm based invention in car

mobility and atomizationl, International journal of engineering and innovative technologyISSN:2277-3754,Volume-3,No-5, pp.238-244,november-2013

- [14] Vivek agarwal, N. Venkata Murali, and C. Chandramouli, —A Cost-Effective 223 Ultrasonic Sensor-Based Driver- Assistance System for Congested Traffic Conditionsl, IEEE Trans. Intell. Transp. Syst., vol.10,NO.3, pp. 486-498, Sep -2009
- [15] Shival Dubey and Abdul Wahid Ansari, —Design and development of vehicle anticollision system using electromagnet and ultrasonic sensorsl, International Journal on Theoretical and Applied Research in Mechanical Engineering ISSN: 2319 – 3182, Volume-2, No-1, pp.80-83, Jan-2013