

PROFESSIONAL TRAINING REPORT
at
Sathyabama Institute of Science and Technology
(DEEMED TO BE UNIVERSITY)

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Technology Degree in

INFORMATION TECHNOLOGY

By

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SCHOOL OF COMPUTING

BONAFIDE CERTIFICATE

This is to certify that this Professional Training Report is the bonafide work of THILAK DARSHAN.V(Reg. No. 38120085) who underwent the professional training in “DISTANCE MEASUREMENT DEVICE” under our supervision from JAN '2020 to JUNE' 2020.

Internal Guide

Dr. P.AJITHA Ph.D.,

Head of the Department

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Submitted for Viva voce Examination held on_____

Internal Examiner

External Examiner

DECLARATION

I, THILAK DARSHAN.V(Reg. No. 38120085) hereby declare that the Professional Training Report on "**DISTANCE MEASUREMENT DEVICE**" done by me under the guidance of Dr. P.AJITHA Ph.D., at Sathyabama institute of science and technology is submitted in partial fulfillment of the requirements for the award of Bachelor of Technology degree in Information Technology.

DATE:

PLACE:

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **SATHY-ABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T.SASIKALA M.E., Ph.D., Dean, School of Computing** and **Dr. R.SUBHASHINI M.E., Ph.D., Head of the Department, Dept. of INFORMATION TECHNOLOGY** for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide **Dr. P.AJITHA Ph.D.**, for her valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the Department of **INFORMATION TECHNOLOGY** who were helpful in many ways for the completion of the project

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DISTANCE MEASURING DEVICE

I. ABSTRACT

Distance measurement of an object in the path of a person, equipment, or a vehicle, stationary or moving is used in a large number of applications such as robotic movement control, vehicle control, blind mans walking stick, medical applications, etc. Measurement using ultrasonic sensors is one of the cheapest among various options. In this project distance measurement of an obstacle by using ultrasonic sensor and a microcontroller is presented.

Necessity of project :

The main objective of this project is to Provide a useful system to measure the distance which will be easy to configure and handle.

INTRODUCTION :

Distance measurement of an object in front or by the side of a moving entity is required in a large number of devices. These devices may be small or large and also quite simple or complicated. Such distance measurement systems are available. These use various kinds of sensors and systems. Low cost and accuracy as well as speed is important in most of the applications. In this project, we have implemented such a measurement system which uses ultrasonic sensor unit and a ATmega32 microcontroller based system. This microcontroller is easily available at low cost. A correlation is applied

to minimize the error in the measured distance. Ultrasound sensors are very versatile in distance measurement. They are also providing the cheapest solutions. Ultrasound waves are useful for both the air and underwater. Ultrasonic sensors are also quite fast for most of the common applications. In simpler system a low cost version of 8-bit microcontroller can also be used in the system to lower the cost.

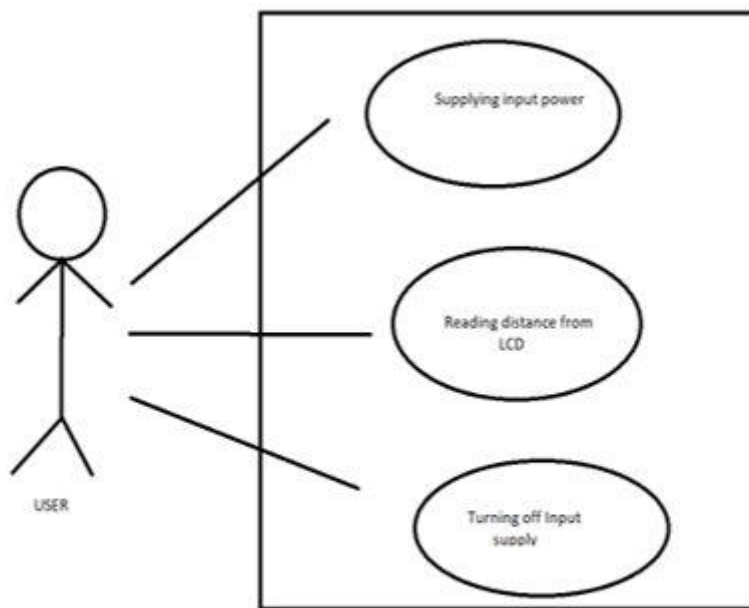
The basic principle of ultrasonic distance measurement is based on ECHO. When sound waves are transmitted in the environment then waves returning back to the origin as ECHO after striking on the obstacle. Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object.

The current methods of blockage detection are based on manual visual inspection and inspection through CCD camera based equipments. In such systems first pictures of obstacle can be obtained and then they are observed and analyzed. The main limitation of these systems are that they cannot tell you the exact distance or location of the obstacle.

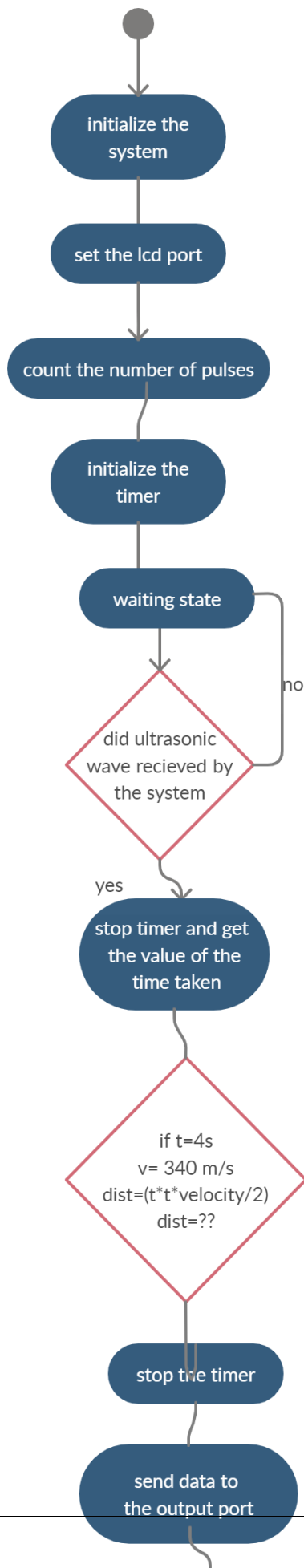
SYSTEM DESIGN:

USE CASE DIAGRAMS:

The UML DIAGRAMS below show for obtaining the time taken before the distance will be calculate.



ACTIVITY DIAGRAM:



Related work component selection :

1. Ultrasonic Sensor – HC-SR04

2. ATmega32

3. 16x2 LCD Display



Figure 3.1: HC SR04

ULTRASONIC SENSOR – HC-SR04



Figure 3.4: Atmega32

ATmega32



Figure 3.7: 16X2 LCD Display

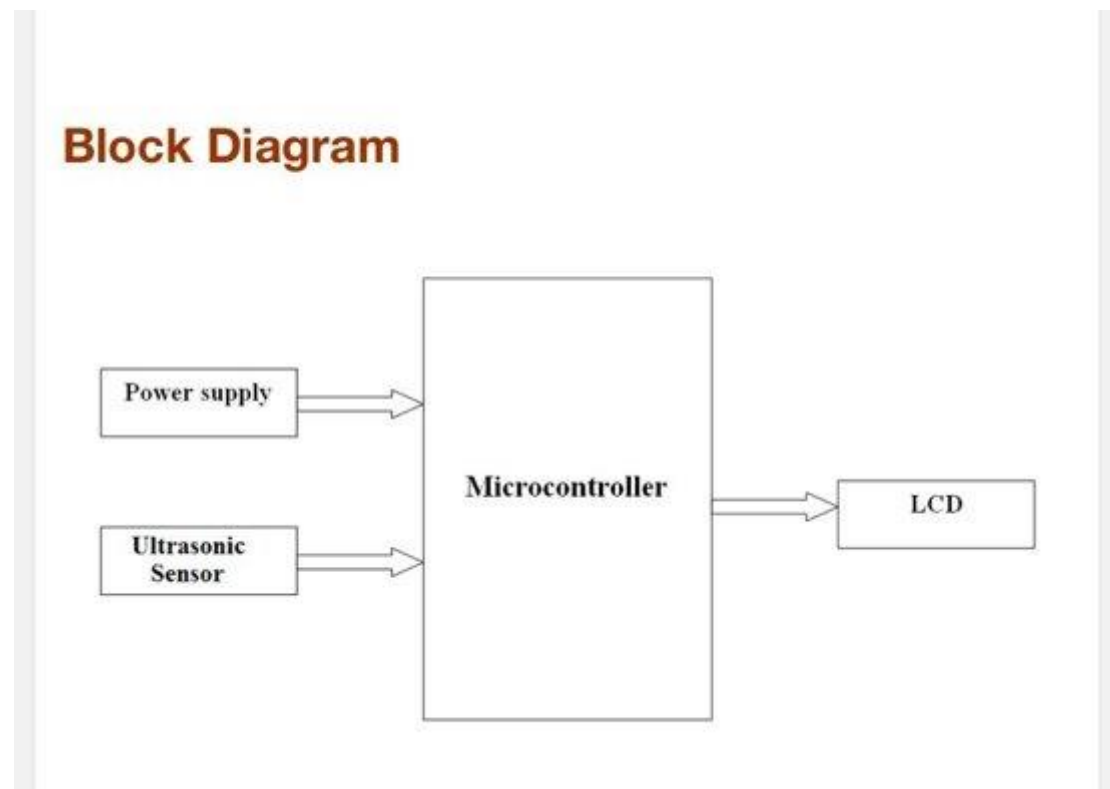
16*2 LCD DISPLAY

Costing :

Component Cost

COMPONENTS	COST
1) HC SR04	200
2) ATmega 32	300
3) 16X2 LCD Display	200

BLOCK DIAGRAM:



Description:

The block diagram mainly consist of six parts

- 1) Power Supply
- 2) Ultrasonic Sensor Unit
- 3) Microcontroller
- 4) 16X2 LCD Display
- 5) Object

1)Power Supply:It is a key block in the project which will be powering to the LCD,MCU and Ultrasonic Sensor

2)Ultrasonic Sensor Unit: A good sensor according to the requirements.

3)Microcontroller: Here we are using Atmega 32 which is used for all the computations needed.

4)16X2 LCD Display:In order to display the distance measured this block is required.

5)Object:It is that thing whose distance is to be measured from the system.

IMPLEMENTATION:

The technique of distance measurement using ultrasonic in air include continuous wave and pulse echo technique. In the pulse echo method, a burst of pulses is sent through the transmission medium and is reflected by an object kept at special distance. The time taken for the pulse to propagate from transmitter to receiver is proportional to

the distance of object. For contact less measurement of distance, the device has to rely on the target to reflect the pulse back to itself. The target needs to have a proper orientation that is it needs to be perpendicular to the direction of propagation of the pulses. The amplitude of the received signal gets significantly attenuated and is a function of nature of the medium and the distance between the transmitter and target. The pulse echo or time-of-flight method of range measurement is subject to high levels of signal attenuation when used in an air medium, thus limiting its distance range.

RESULT:

The working model of the proposed AVR Atmega32 microcontroller based range finder using ultrasonic module was successfully designed and implemented. The performance of the circuit was analysed for different conditions. The circuit was able to measure distance up to 2.5m without interfering in human activity. Circuit was tested for measurement of various distances in different atmospheric conditions, accurately. It has a fast response. The ultrasonic module works fine. It responds to the incoming echo accordingly. By using ATmega32 and HC-SR04 we were able to reduce the cost and increase efficiency. This implementation has been a major component in the circuits of major fast consuming electronic goods.

APPLICATIONS:

1. Used to measure the obstacle distance.
2. This system used in automotive parking sensors and obstacle warning systems.
3. Used in terrain monitoring robots.

CONCLUSION:

The objective of this project was to design and implement an Ultrasonic Distance Measurement device. As described in this report

a system is developed that can calculate the distance of the tracked object. With respect to the requirements for an ultrasonic rangefinder the followings can be concluded. 1. The system can calculate the distance of the obstruction with sufficient accuracy. 2. This device has the capability to interact with other peripheral if used as a secondary device. 3. This can also communicate with PC through its serial port. 4. This offers a low cost and efficient solution for non-contact type distance measurements.

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This is to certify that **THILAK DHARSHAN V** student of **SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY, BTECH/IT** has undergone the Internship Training through online in our concern entitled **PHP&SQL** from **15th Aug 2020 to 29th Aug 2020** in relevant departments related to their academic studies.

During the above period, the performance was good & we wish great success in all your future endeavours.

J. mere

Technology drives the world. We are the people who are behind the technology.

Authorised Signature



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