

# Lab VIEW BASED TEXT DETECTION AND OBJECT RECOGNITION PROTOTYPE FOR THE BLIND AND THE DUMB PEOPLE

G.SOWMYA<sup>1</sup>N.SREENIVASA RAO<sup>2</sup> SYED MUNNAWAR<sup>3</sup>

<sup>1,2,3</sup> Asst.Prof Dept of ECE, Santhiram Engineering College.

**Abstract:** Most of the people suffer with visual or auditory disabilities either because of weakness or lack of capacity to utilize the sensory organs such as eye and/or ear. These sensory organs basically have control over the remaining parts of the body. This predicament could be born sometimes since birth, or due to the age factor or because of accident. Disability affects the life of humans irrespective of its origin and reason. The disables require support from other people for handling any of their daily routines they have to be guided or we can say they have to depend on others for their need. Sound source locator is inherently important for safety, survival and navigation of the physically challenged individuals. In addition to sound source locator the acoustic cues and the visual cues are needed for object detection, tracking and distance measurement etc. Object recognition and detection are considered most important help that we can provide through electronic travel aids for the blind since they need a totally independent travel kit that works on the artificial intelligence. Here the Paper is focused on the implementation of a hardware and software to recognize an object by using ultrasound technology. Another objective of this Paper is to upgrade the object identification module to notify the temperature and humidity conditions of the location through buzzer. The paper is to design a prototype that helps the disables especially the blind and the dumb to walk free as a normal person identifying the objects as well as texts that comes on their way besides notifications of a temperature and humidity conditions of the concern location.

## 1 INTRODUCTION:

The visually impaired and blind people face numerous challenges in routine tasks such as making coffee or crossing roads. Identification of objects and movement in the surroundings is a primary challenge for them which normal sighted people take for granted. We aim to provide some assistance to them via software based on android platform and LabVIEW software which will help easy the difficulty of performing the task of object identification and motion detection. There are about 285 million visually impaired people in the world, around 39 million of which are blind.

Blindness is a state of lacking the visual perception due to neurological or physiological factors. The partial blindness represents the lack of

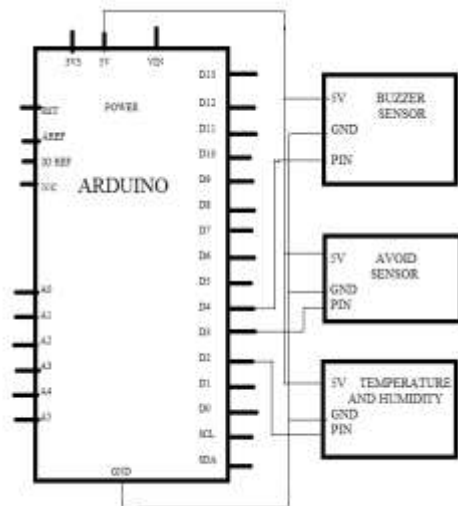
integration in the growth of the optic visual or nerve centre of the eye, and total blindness is the full absence of the visual light perception. In this Paper, cheap, a simple friendly user, low cost, smart blind guidance system is designed and implemented to improve the mobility of blind and dumb people in a specific area. The proposed work includes a wearable equipment consists of sensor based obstacle detection circuit is developed to help the blind person to navigate alone safely and to avoid any obstacles that may be encountered, whether fixed or mobile, to prevent any possible accident. The main component of this system is the infrared sensor which is used to scan a predetermined area around blind by emitting-reflecting waves. The main objective of this Paper is to develop an application for blind people to detect the objects in various directions, detecting pits and manholes on the ground to make free to walk by detecting objects using image processing can be used in multiple industrial as well as social applications. This Paper is proposing to use object detection for blind people and give them an alert sound from the buzzer. We are detecting an object using the sensor and giving voice instructions about the direction of an object. User must have to train the system first about the object information. It is also helpful for the dumb people to express their views.

Millions of people around the world are estimated to be visually impaired or dumb. Performing daily routine activities such as moving around places, detecting obstacles and identifying various objects has been always a serious problem for them. Keeping such problems in consideration, idea is to design a device which is portable with reliable hardware along with the efficient software. This device will help disabled people in such a way that they will move easily from one place to another by avoiding any obstacle in their way, that too without the need of help from other people. They will also be able to detect/recognize various objects commonly present around them. This will help them in performing their daily activities easily, independently and more efficiently in an affordable manner. Following are the equipment required in this Paper: 1. Laptop with Windows Operating System 2. LabVIEW Software 3. Speakers, 4. Arduino Hardware Controller board 5. Sensors. This Paper basically is an integration of embedded sensors.

Object Detection using Avoid sensor: In this module

when the user enter some place. This will call a function in which object detection algorithm is performed on the object and gives information to disabled person through Buzzer Sensor. Temperature and Humidity Sensor: This will call a function in which the Temperature and Humidity algorithm is performed and gives the data to disabled people through Audio/speaker. Text to speech conversion: In this module we can convert the given text into speech.

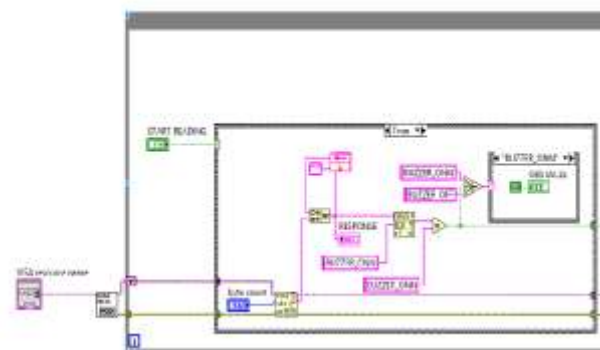
## 2. Proposed Method



**Fig 1: Sensor Connection with Arduino**

The above are the connections of sensors with the Arduino board. The Avoid Sensor is connected to the Digital I/O Pin3. The Temperature and Humidity Sensor (DHT11) is connected to the Digital I/O pin 2 in Arduino Board the Buzzer Sensor is connected to the digital I/O Pin 4 in Arduino Board. All the Grounds in the sensors are connected to the Arduino Ground. All the 5v in the sensors are connected to the Arduino VCC.

### 2.1 OBSTACLE AVOIDSENSORWITH BUZZER:



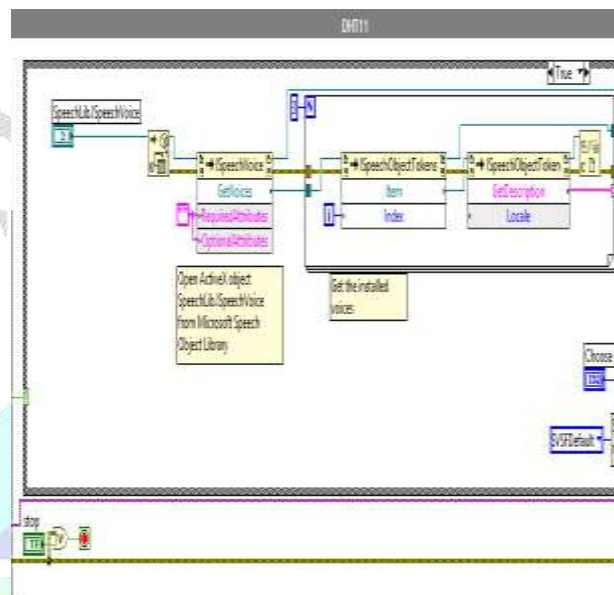
**Fig 2: VI for Obstacle avoid sensor with buzzer**

Generates a square wave with the specified frequency and 50% duty cycle. Use this VI with frequency equal to 0 to stop the signal generation on the specified pin. This command can only be used on one pin at a time and signal generation must be stopped on one pin before it can be started on another. In this the

Sensor is connected to the I/O pin 3 by using the digital pin mode and then it is given to the digital read pin which is used to read from Arduino and it is given to the case structure and when we place the object we are going to get 0 and the Buzzer will on if not it will not on.

### 2.2 TEMPERATURE AND HUMIDITY SENSOR:

This VI is used to Read the Temperature and Relative Humidity from the Environment and give the output about the Relative Humidity and Temperature as shown in the figure.



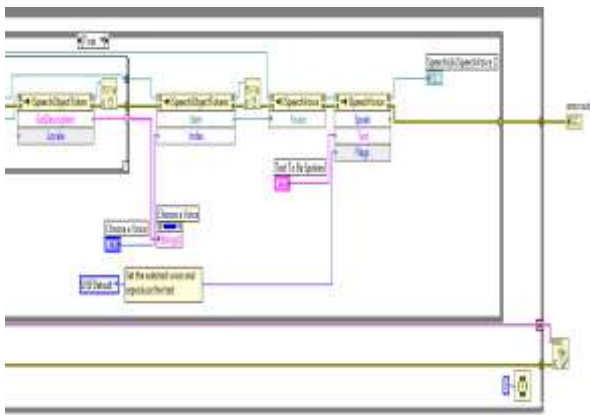
**Figure 3 VI for Temperature and humidity sensor**

Here we are selecting the digital I/O pin 2 and the sensor type we use is DHT11. At the send Receive we are going to give all these as an input along with the bytes to read we get the output as in the form of Read Buffer as a string and it is converted to the integers and is given to the index array. By using the Logical shift and word integer we are going to get the temperature and humidity.

### 2.3 TEXT TO SPEECH CONVERSION:

This VI is an example of Text to Speech (TTS) using the Microsoft Speech SDK Turn off all audio applications before running this VI.

1. Enter the text to be read in the textbox.
2. Choose a voice.
3. Run the VI.



**Figure 4 VI for Text to speech conversion**

The first time you run this VI, the ring control might change according to the voice order that the Speech SDK installed it in. This varies on different systems. But after the first time, the ring control remains the same. For more information on the methods and properties, refer to the documentation that is included with the SDK

### 3. EXPERIMENTAL RESULT:

The below figure represents the output of a Paper, that will be shown in front panel in labview. The corresponding outputs are

#### 1. Temperature and Humidity:

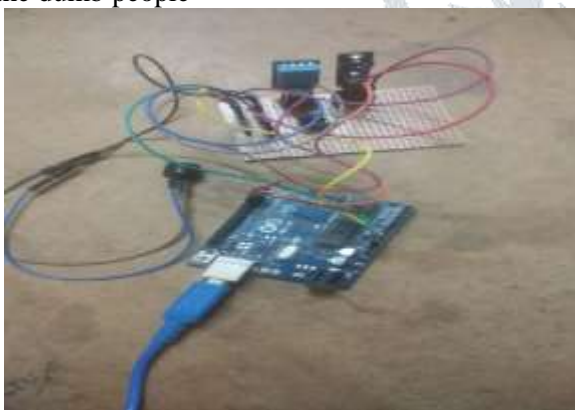
It will show the current temperature and humidity readings.

#### 2. Object Recognition:

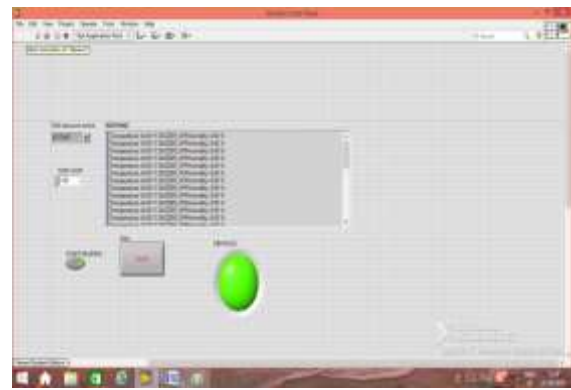
It will give an alert sound from the buzzer only when obstacle is present in front of blind people.

#### 3. Text to speech conversion:

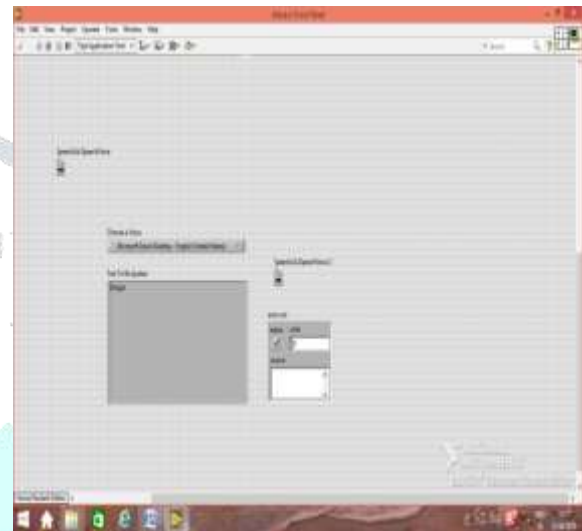
It converts the given text into speech for the dumb people



**Figure 5 .Proposed module circuit**



**Figure 6: Output in front panel for DHT and obstacle detection**



**Figure 7. Output in front panel for text to speech**

### 4. CONCLUSION:

Object recognition algorithms and Temperature and Humidity reading from sensors based on android platform and Lab view tool are dedicated for blind people and providing text to speech conversion for the dumb people. Namely the object recognition algorithm this application will aid visually blind users in day to day activities. It will provide a portable solution to the problem of object detection without the need to carry any additional devices.

### 5. FUTURE SCOPE:

In this work we focus on improving object detection through the use of more representative features and better models. We propose new features that are not only more powerful, but also more robust and capture more information than the currently popular features. Further, we propose scalable models which can leverage large amounts of training data to improve performance through Lab VIEW.

**REFERENCES:**

- 1.A Novel Model for Speech to Text Conversion, Deepa V.Jose, Alfateh Mustafa, Sharan R, published in International Refereed Journal of Engineering and Science (IRJES) ISSN (Online) 2319-183X, (Print) 2319-1821 Volume 3, Issue 1 (January 2014), PP.39-41.
- 2.T. Dutoit, (1997). (An Introduction to Text-to-Speech Synthesis.Kluwer Academic Publishers, Dordrech/Boston/London; Figure 10.1.).
3. Yee-Ling Lu; Mak, Man-Wai; Wan-Chi Siu , "Application of a fast real time recurrent learning algorithm to text-to-phoneme conversion," Neural Networks, 1995. Proceedings IEEE International Conference on, vol.5, no., pp.2853, 2857vol.5,Nov/Dec 1995.
- 4.Jeffrey., Travis, (2006). LabVIEW for everyone : graphical programming made easy and fun. Kring, Jim. (3rded.).
- 5.Rowe, Martin. "LabVIEW NXG: Version 2.0 is coming". *EDN Network. Aspecore*. Retrieved 16 September2017.
- 6.Bress, Thomas J. (2013). *Effective LabVIEW Programming*. [S.l.]:NTS Press. ISBN1-934891-08-8.
- 7."Application Design Patterns: State Machines". *National Instruments white papers*. 8 September 2011. Retrieved 21 September2017.
- 8."Application Design Patterns: Master/Slave". *National Instruments white papers*. 7 October 2015. Retrieved 21 September2017.
- 9."Application Design Patterns: Producer/Consumer". *National Instruments whitepapers*. 24 August 2016. Retrieved 21September2017.
- 10.NI Instrument Driver Network "LabVIEW MathScript RT Module". www.ni.com. Lab View Home Bundle forWindows.
- 11.<http://thinkinging.com/2007/06/17/top-5-bad-excuses-for-not-using-source-code-control/http://www.ni.com/white-paper/4114/en/>
- 12.<http://www.ni.com/tutorial/14304/en/> "Can I Zoom In or Out on a Lab VIEW Diagram (for Wiring or Viewing Purposes)?" . Retrieved February 1,2016.
- 13."Add a zoom function (yes, I said zoom. So sue me)". *forums.ni.com*. Retrieved 2016-03-31.<http://www.ni.com/white-paper/5920/en/>
- 14.<https://decibel.ni.com/content/docs/DOC-13859>Embedding a C/C++Interpreter Ch into LabVIEW for Scripting

