



A SMART GRAPHIC EYE FOR VISUALLY IMPAIRED WITH TEXT-TO-SPEECH CONVERTER

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Abstract: In the motive of supporting the visually impaired people, a method is proposed to develop a self-assisted text to speech module in order to make them read and understand the text in an easier way. It is not only applicable for the visually impaired but also to any normal human beings who are willing to read the text as a speech as quickly as possible. It is a specially designed graph to break the limitations of blind people who cannot read or write a text. It is a helpful tool for them to understand things easily. The text size is an important factor whose dimension should be properly elected to make the method more general and insensitive to various font shapes and sizes. The proposed method involves four steps detection of an object, localization of the text, extraction of the text and text to speech conversion. It helps to read the screen and display the app which the user wants to find. Text-to-Speech conversion is a method that scans and reads English alphabets and numbers.

Index Terms – Text Reading for Blind, Text to speech method, Braille Keyboard, Voice Processing.

I. INTRODUCTION

According to the World Health Organization (WHO), around 285 million people around the world are estimated to be visually impaired, out of which 90 percent live in developing countries. Technology plays a major role in our day-to-day life. We are living in a world driven by technology. The advancement of Technology has played an important role in the development of human civilization. Technology provides innovative ways of doing work through various smart means. Blind people face a lot of difficulties. So, the same technology is possible for handicap peoples. Technology is best when it brings people together. It has become appallingly obvious that our technology has exceeded our humanity. For example, assistive technology enables students with disabilities to

compensate for certain impairments. This specialized technology promotes independence and decreases the need for other support. Rehabilitative and assistive technology can enable individuals to Care for themselves and their families. Text to speech technology is the process wherein the computer is made to speak. It uses the concepts of natural language processing. In Text reading applications, there are many different techniques available such as label reading, voice stick, brick pi reader and pen aiding but these methods can perform text to speech by creating datasets.

II. RELATED WORK

T. Rubesh Kumar et al[1] proposed reading is obviously essential in today's society. Printed text is everywhere in the form of reports, receipts, bank statements. There are already a few systems that have some promise for portable use, but they cannot handle product labeling. But a big limitation is that it is very hard for blind users to find the position of the bar code and to correctly point the bar code reader at the bar code. T. Rubesh Kumar, C. Purnima have proposed a camera-based assistive text reading framework to help blind persons read text labels and product packaging from hand-held objects in their daily lives.

Pooja Sharma et al[2] proposed Blindness is a state of lacking the visual perception due to physiological or neurological factors. In this proposed work by Pooja Sharma, Mrs. Shimi S.L. and Dr. S. Chatterji, a simple, cheap, friendly user, virtual eye will be designed and implemented to improve the mobility of both blind and visually impaired people in a specific area. The proposed work includes a wearable equipment consists of head hat, mini hand stick and foot shoes 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.

Dynamic input cannot be given in the existing system. They do not allow Text-to-Speech Converter. Data is not stored in the backend & can only be displayed. If we forgot any point then it cannot be determined in any ways. It is difficult to build a perfect system. Hard to find position of text

DRAWBACKS

- ❖ The resulting speech is less than natural and emotionless.
- ❖ This is because it is impossible to get audio recordings of all possible words spoken in all the possible combinations of emotions, prosody, stress etc.
- ❖ Pronunciation analysis from written text is a major concern. It is difficult to build a perfect system.
- ❖ Filtering background noise is a task which can even be difficult for humans to accomplish.

III. PROPOSED WORK

The main component of this system is the ultrasonic sensor which is used to scan a predetermined area around blind by emitting-reflecting waves. The reflected signals received from the barrier objects are used as inputs to the Arduino microcontroller. The proposed system is cheap, fast, and easy to use and an innovative affordable solution to blind and visually impaired people in third world countries.

- ❖ It gives the ability to understand dynamic charts and get the information they need independently.
- ❖ Dynamic inputs can be given.
- ❖ Supports Text-to-Speech Converter.
- ❖ .By using braille keys inputs are given and inputs are used for converting text to braille words for blind people .
- ❖ For printing the braille words-braille printer are used to take the printout.
- ❖ Java swing is used for front end url .By using Lang package we are executing the others app.
- ❖ By using Jsoup class we are converting English letters to braille letters.

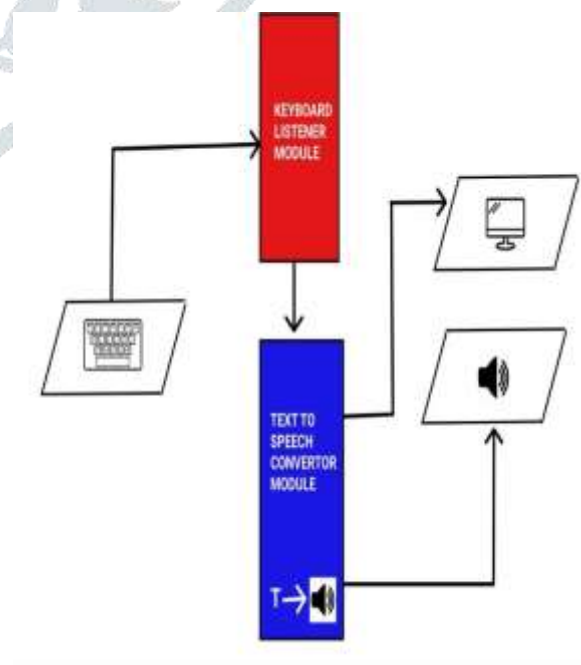


Figure 1: SOFTWARE FOR BLIND PEOPLE

IV. WORK PLAN

People who suffer from low vision, sight and visual impairment are not able to see words and Letters in ordinary newsprint, books and magazines clearly. our project helps to overcome the issue. Arrow key use to move the yellow cursor. when we press right arrow key and keep the cursor between 4 to 5, we may see a change of 1 unit and when we press control +right arrow key it changes 0.1-unit changes move to right side. for example 5.1,5.2 we can take any point. when we press control +left arrow key it changes 0.1unit changes move to left side. for example, 5.1,5.2 we can take any point. when we press control +up arrow key it changes 0.1-unit changes move to upside. for example, 5.1,5.2 we can take any point. when we press control +down arrow key it changes 0.1-unit changes move to down side. For example, 5.1,5.2 we can take any point. If we press space bar 0,0. corner does not move cursor. To select a plot of 2.6 enter we may see 2.6 is plotted. If we press enter key the points will be plot and it will spell out the x and y axis points. We have use voice Kevin package (Kevin directory).

V.REQUIREMENTS AND COMPONENTS

1. Arduino board
2. A speaker
3. An Amplifier Circuit
4. Regulated Power Supply
5. Connecting Wires
6. Braille Keyboard

ARDUINO BOARD

- ❖ Arduino Board is used to Read the input based on sensor, button, or finger.

A SPEAKER

- ❖ Speaker used to produce audio output that can be heard by the listener.

AN AMPLIFIER CIRCUIT

- ❖ Amplifier Circuit used to Input signal to an amplifier will be a current or voltage and the output will be an amplified version of the input signal.

REGULATED POWER SUPPLY

- ❖ Connecting Wires is used to Transfers current from one point on a circuit to another.

CONNECTING WIRES

- ❖ Regulated Power Supply: It regulated the voltage in a circuit relatively close to a desired value

BRaille KEYBOARD

- ❖ Braille Keyboard use for giving input by virtually impaired persons.

VI. ARDUINO BASED TEXT TO SPEECH CONVERTER

The Text to speech or TTS system converts plain text to speech. This technology allows the system to speak text with a human voice. There are many examples of text-to-speech conversions such as public transport announcements, customer service calls, and voice assistants on your smartphones or the navigation menu on any machine. You can even find the TTS in Microsoft Word where you configure it to speak the text written in the document. Today in this tutorial, we are going to learn how to create a text-to-speech converter using Arduino. We previously used TTS with Raspberry Pi to speak Alarm Clock and also converted speech to text in Raspberry Pi using Google's voice keyboard.



Figure 2 : Arduino Based Text To Speech Converter

First step is to convert the normalized text into phonemes or phonetic transcriptions. Phonemes are the small parts of spoken words, for example, it is the sounds that make the sentences. This step is really essential for the machine to pronounce the words like humans do. The last step is the synthesis of phonemes into spoken voice. This step can be achieved by different methods like by recording the human voice for different words/phrases either by generating basic sound frequencies and accumulating them in the form of phonemes, or by copying the mechanism of human language.

VII. MODULES USED IN THE PROPOSED SYSTEM

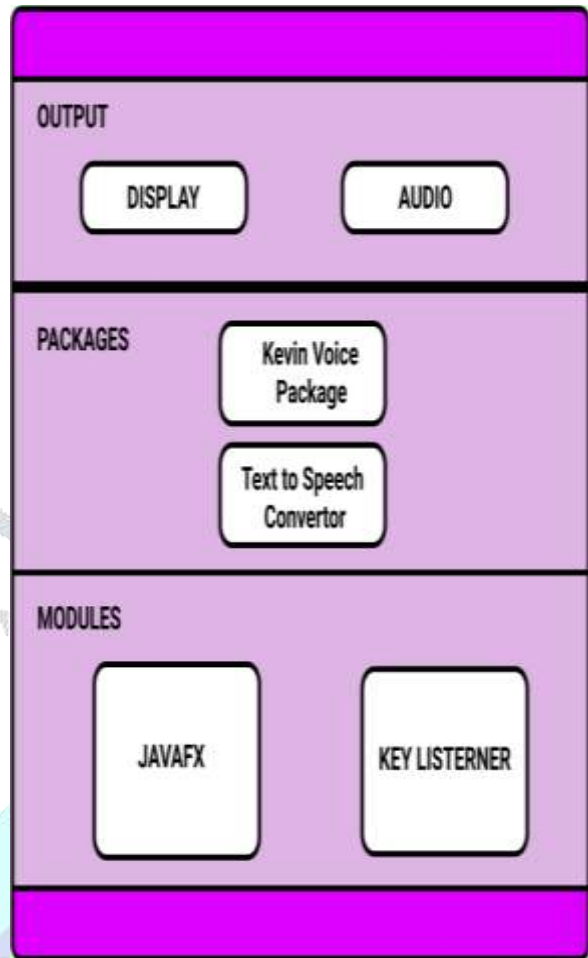


Figure : 3 Flow of the Proposed System

MODULE 1: Plotting Graph through Braille

- ❖ Using braille keyboard, virtually impaired people can give input to the system.
- ❖ A line chart uses points connected by line segments from left to right to denote changes in value.
- ❖ Scene builder is used to create a line chart and it also used to joint the x and y coordinate.

MODULE 2: Identifying the Key Position

- ❖ Key listener is used to do the action according to the key pressed in the keyboard.
- ❖ User can give dynamic input and can get output in a speech.

MODULE 3**3.1: Text to Speech Converting**

- ❖ Text to speech is a process to convert any text into voice.
- ❖ This technology enables the system to speak out the text in a human voice.
- ❖ It is used to reads the value of x and y coordinate and spell out the value of X and Y.

3.2: Voice Modulation

- ❖ Audio processor is used to spell out the value of x and y.
- ❖ We used **Kevin Package** from Java interface for Voice Recognition.
- ❖ The **javafx.speech** package defines the common functionality of recognizers, synthesizers, and other speech engines.

MODULE 4: Assembling the Kit

- ❖ Arduino Board is used to Read the input based on sensor, button, or finger.
- ❖ Speaker used to produce audio output that can be heard by the listener.
- ❖ Amplifier Circuit used to Input signal to an amplifier will be a current or voltage and the output will be an amplified version of the input signal.



Figure : 4 Drawing Graph using Braille Keyboard



Figure : 5 Working various applications using Braille Keyboard

VIII. CONCLUSION

In this work, Intelligent Graphic Eye with Text-to-Speech Converter helps the user to draw the graph. The purpose of a graph is to present data that are too numerous or complicated to be described adequately in the text and in less space. This converter is developed using javafx and speech packages in

JDK. It helps the user to read the screen and display the app which they wants to find and work using Braille keyboard.

IX. REFERENCES

- [1] T.Rubesh Kumar, C.Purnima “Assistive System for Product Label Detection with Voice Output For Blind Users” International Journal of Research in Engineering & Advanced Technology 2014.
- [2] Pooja Sharma, Mrs. Shimi S. L and Dr. S.Chatterji, ”Design of microcontroller based virtual eye for the blind” International Journal of Scientific Research Engineering & Technology,2014.
- [3]<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1002128>
- [4]https://issuu.com/ijtsrd.com/docs/210_arduino_based_voice_generator_text_to_speech_r
- [5]<https://chartio.com/learn/charts/line-chart-complete-guide/>
- [6]https://www.researchgate.net/publication/282268546_Text_to_Speech_Conversion_System_using_OCR
- [7]<http://www.comsys.net/technology/speechframe/text-to-speech-tts.html>
- [8]<http://www.rspublication.com/ijst/aug%2013/6.pdf>

