Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 1): pp. 5109-5114
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2021.01.545

Self-Learning Braille Application For Visually Impaired People

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Abstract-Braille is vital to all visually impaired individuals and it's the only system through which visually impaired children can learn to read and write, yet the rate of Braille literacy among visually impaired people belonging to developing countries including India is alarming low.The project describes a Arduino based Hardware Implementation of the Braille teaching device.It implements the presence of combination of six vibration motors which is operated using the input received from the Arduino.All the vibration motors are controlled using Relay.We believe that by implementing the designed Braille system in schools and homes, Braille literacy rate can be increased and visually impaired people can be employed and can fully participate in society.

Keywords- Arduino,Braille, Vibration Motors, Relay.

I. INTRODUCTION

According to the survey of world health organization (WHO), there are more number of visually impaired people living in various countries. Because of the rate of Braille literacy in various countries is alarming low which effect on the significant relationship between higher income and employment, braille literary and academic success and also education plays a crucial role. Now a days a very less number of people are learning to read and write. A Braille system consists of 6 dots, in two columns where 3 dots in each column. Using this 6 raised dots 64 different sign can be created. There are three types of Braille system encoding such as Grade 1, Grade 2 and Grade 3. Where Grade 1 consists of letter-by-letter transcription it is used for basic literacy and it also consists of English standard alphabets and punctuation marks. In Grade 2 Braille system is made up of English alphabets, punctuation marks, number(0 to 9) and contractions. This system is used for books, menus and other Braille materials. It also consists of few

words. Grade 3 Braille system is used for personal use. It consists of entire words shortened to a few letters.

II. RELATED WORKS

There is variety of brands devices available in the market for visually impaired people to help them in educational activities and to bridge the communication gap between visually impaired people and people with sight.According to World Health Organization (WHO), about 89% of world's visually impaired live in developing countries and majority of the people are living with the lowest pay as the national salary i.e. the average salary if the person is so low that. Most of the devices in the market are too costly and not so comfortable to use, or Braille scanners, yet a low-cost Braille system is not available in the market for visually impaired persons in the developed countries where braille reading and writing can be teached without a Braille teacher . Braille Keyboard is a Self-Learning Braille System for Visually impaired at cheap price, easy to use, low-power, portable, self-learning, and user-friendly Braille writing and reading tutor with the capability of reading documents and works on text-to-speech technology which is the helpful technology for visually impaired individuals.

EXISTING SYSTEM

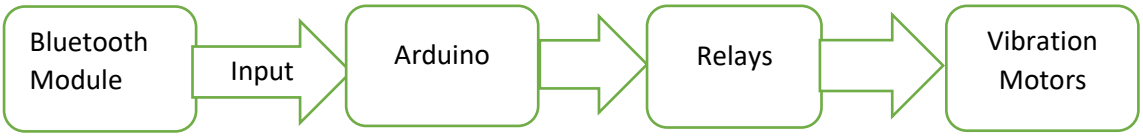
A. Braille Keyboard

The designed braille keyboard is very helpful for visually impaired people. It is also a low cost, portable, low-power, light in weight, self-learning and user-friendly device. It works on text to hear technology. It has a capability of reading documents and shows in text form using cool term software. We can save that document. We can use PC monitor as a display.

B. Braille Printer

It operates as a normal printer, but it gives an output in Braille form for visually impaired people.

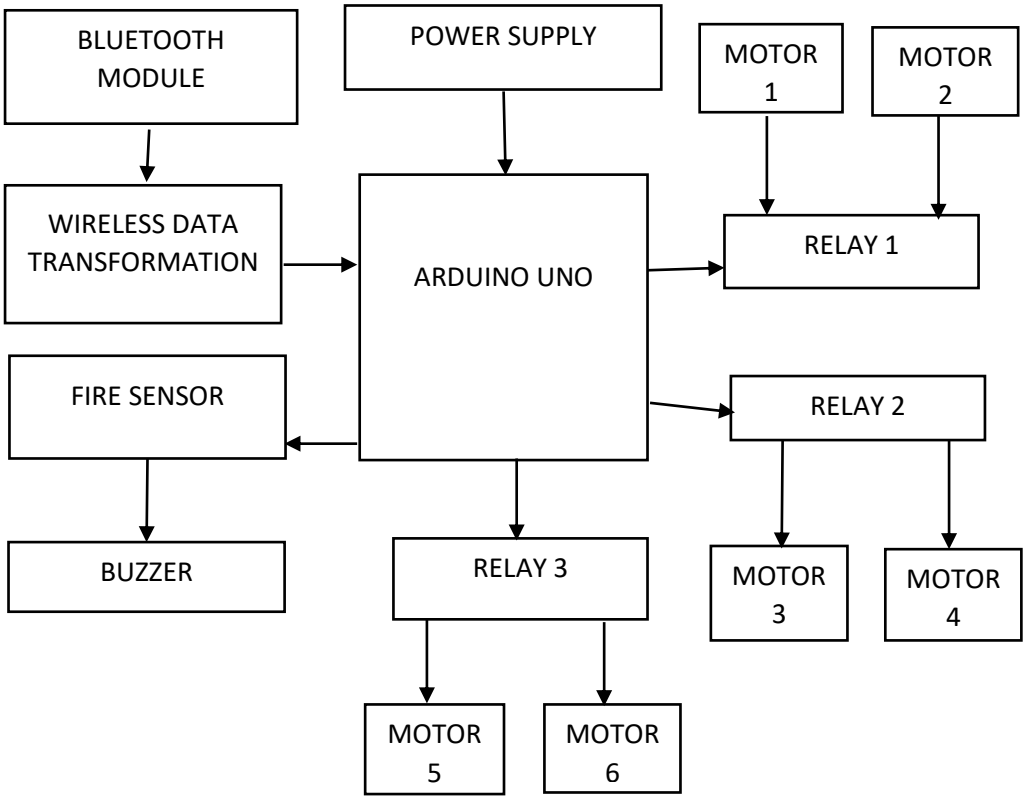
III. WORK FLOW



Processing of input

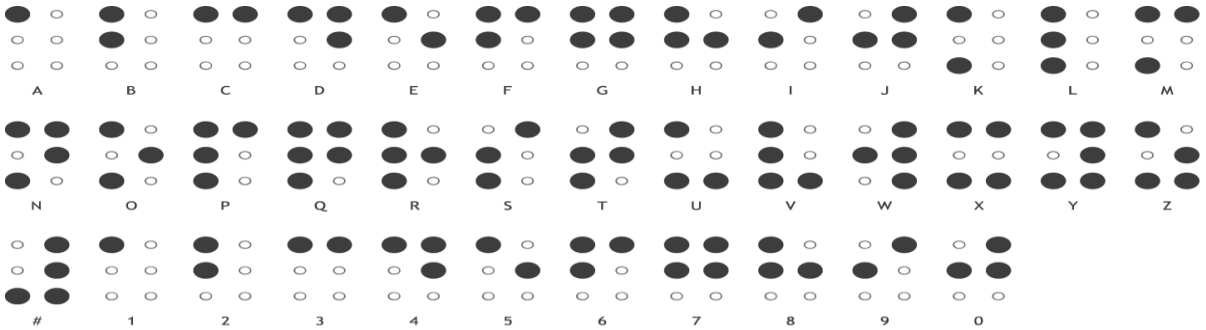
The proposed method aims at educating the visually impaired people by using self-learning techniques.The Arduino receives the input from the bluetooth module.The Arduino process the input and sends it to the corresponding relays. The relay, in turn, uses the received input and turns the motors ON. There are three relays and six motors.

IV. PROPOSED SYSTEM



The proposed method describes a Arduino based Hardware Implementation of the Braille teaching device.It implements the presence of combination of six vibration motors which is operated using the input receivedfrom the Arduino.All the vibration motors are controlled using Relay.There are three relays and six vibration motors. Relay 1 controls motors 1 and 2 whereas Relay 2 controls vibration motors 3 and 4.

Motors 5 and 6 are controlled by Relay 3. The Bluetooth device will be paired with the mobile. The Arduino receives the input from the blutooth module and sends it to the corresponding relays. The relay receives the information and turns the vibration motors ON. By using this way, the students will be able to learn alphabets, words and numbers. Between each letter or number, there will be a delay of two seconds.



V. Components Used

Arduino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/outputpins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16MHz ceramic resonator(CSTCE16M0V53R0), a USB connection, a power jack, an ICSP header and a reset button.

A BlueTooth module is usually a hardware component that provides. a wireless product to work with the computer; or in some cases, the bluetooth may be an accessory or peripheral, or a wireless headphone.

Relay is also a switch that connects or disconnects two circuits. But instead of manual operation a relay is applied with electrical signal, which in turn connects or disconnects another circuit. Relays can be of different types like electromechanical, solid state.Electromechanical relays are frequently used.

Vibrationmotor is a coreless DC motor and the size of this motor is compact. The main purpose of this motor is to alert the user from receiving the call by without sound/vibrating. These motors are applicable for different applications like pagers, handsets, cell phones, etc.

VI. Conclusion

The presented solution may be a low-cost, low-power, portable, self-learning, and user friendly Braille system. The presented solution may be a comprehensive system for learning. The designed Braille system supports all levels of the Braille system. This is a self-learning system so by implementing this Braille system in schools and houses, time, money, and human resources is saved. It is believed that by implementing this method in developing countries, the speed of Braille literacy is increased and visually impaired people is employed and may fully participate in society.

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