Smart Tutor for Visually Impaired Beginners

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Abstract — Education is the right of every human being. Normal students can learn from teachers by observing & communicating. However, because of visual impairment, learning to read and to write becomes very difficult. The traditional teaching methods for visually impaired students are time consuming and needs teacher's attention and hard work. Due to difficulties in learning Braille using traditional methods and lack of trained teachers, the literacy rate of visually impaired people is very poor. In proposed system microcontroller 8051 and Atmega328 based hardware implementation facilitate Braille learning through a sense of touch. For different alphabets and numbers, Braille script patterns are generated using solenoids. With this tutor system, an adult who does not have formal Braille training can help and assist the visually impaired students to learn Braille and assess their learning levels.

Keywords — *Microcontroller 8051, Atmega328, solenoids, Braille script.*

I. INTRODUCTION

Braille script is used to read and write by visually impaired people. In Braille raised dots represent normal alphabetical English words. Braille also contains symbols, punctuation marks for representing Braille script. To read Braille, move the fingertips on the raised patterns or symbols. By sensing the Braille patterns, visually impaired people can learn the written word. Braille language gives access for a big source of educational material, literature, information of finances, different sports and culture etc. This helps visually impaired to enrich their educational and cultural activities, to inculcate new hobbies in their daily life.
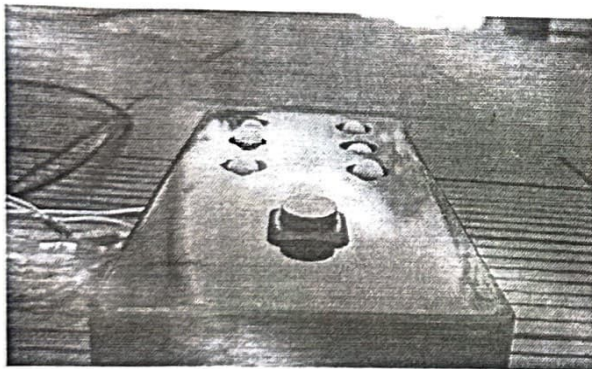

Fig.1 Braille Sensing Using Solenoid Actuators [1]

Various teaching methods have been developed to make visually impaired people to read and write so that they can communicate with the other people. However, Braille system become successful as it is based on signs designed for fingertips which helps learner to learn with confidence. The objective of smart tutor is to provide electronic reading to get easy access of information to Braille users. It will help to strengthen and boost the knowledge of user. Smart tutor is an economical system. It is portable, compact, of low cost, and easy to use.

II LITERATURE REVIEW

Braille language using Braille keypad is mainly used to educate visually impaired people, so that they can learn and interact with each other. It will help to increase the literacy rate of our country.

A. Braille Alphabets

Braille alphabet, Braille numbers and special symbol characters are made by using six dots. Pattern of six dots are as same as six dots present on dice which is sensed by the user. Pattern of six dots contains two lines in parallel and three dots in each line so total six dots are present. Using six dots we can make many different patterns for alphabet, number and for special symbols in Braille script.
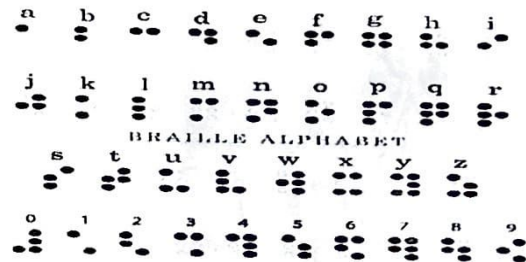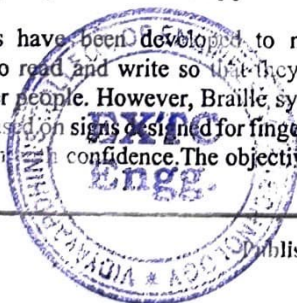

Fig. 2 Braille Alphabets [2]

Fig. 2 shows the different patterns available for different alphabets and numbers. For long words and long digit numbers also shortcut pattern is available in these six dots. It will reduce the time for typing each number and alphabet which is one of the beneficial features of Braille language.

Top first four dots are used to form first ten letters of the alphabet. Adding a dot, number 3 in the first column forms the next ten letters, and last six letters are formed by adding a dot number 3 in the second column. Unique pattern of dots is used to represent punctuation. In the Braille script, patterns are available for many big words. Braille cells are used for entire words or a combination of letters [2].

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