

Chapter 14

Prototype Implementation of Innovative Braille Translator for the Visually Impaired With Hearing Deficiency

Soumen Santra

Techno International NewTown, India

Arpan Deyasi

 <https://orcid.org/0000-0003-3056-896X>

RCC Institute of Information Technology, India

ABSTRACT

Text-to-Braille conversion as well as speech-to-Braille conversion are not available in combined form so far for the visually impaired, and there is tremendous need of a device that can look after this special class of people. The present chapter deals with a novel model that is designed to help both types of impaired people, be it visual problem or related with hearing. The proposal is itself unique and is also supported by experimental results available within the laboratory condition. This device will help people to read from text with their Braille language and will also help to convert the same form to audio signal. Since text and audio are the two main interfaces for any person to communicate with the external world apart from functionalities of sensory organs, the work has relevance. With the help of DANET, the same data, in text or speech form, can be accessed in more than one digital device simultaneously.

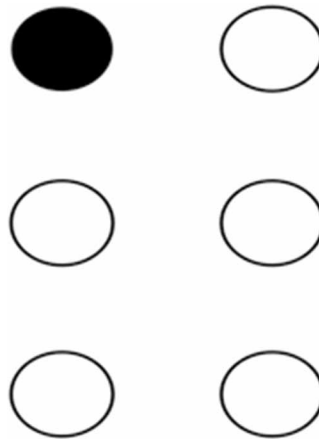
1. INTRODUCTION

In 1821 a blind Frenchman Louis Braille invented a writing system to help blind people read and write (Choi et al., 2004; Fritz & Barner, 1999; Fukumoto & Tonomura, 1997), later nomenclature of his name. Now engineers invented many modern techniques in different wings of life, but blind peoples are still facing problems related to traditional lifestyle. They still use traditional Braille set-up for the purpose

DOI: 10.4018/978-1-7998-4186-9.ch014

reading and understanding content of materials or books etc. As per Fig 1, (Wikipedia, n.d.a) Braille consists of a cell of six raised dots arranged in two columns of three dots, which the user can read by feeling using a finger (Fritz & Barner, 1999; Fukumoto & Tonomura, 1997), (Ng et al., 1999). The Braille system is used worldwide by blind people and has also been translated in other languages. Braille is a series of raised dots that can be read with the fingers by people who are blind or whose eyesight is not enough for reading printed material. General people who are not visually impaired ordinarily read Braille with their eyes (Choi et al., 2004), (Fukumoto & Tonomura, 1997), (Ng et al., 1999). In Fig 2, (Wikipedia, n.d.b) we have shown the different alphabets overview structure in Braille. The visually impaired people who can touch and feel objects around them to picture their surroundings their finger tactile receptors get exceptionally well developed. This allows them to be able to feel details sighted people barely notice. Braille is not a language, but it is a code by which other languages may be written and read device (Blenkhorn, 1995; Blenkhorn, 1997; Lahiri et al., 2005). The standard cells have one to six dots. The dots are arranged in two parallel columns of three positions each shows the representation of the English alphabet in Braille. This in turn makes the blind people independent and well educated. Blind people play a vital role in the development of the society and without consideration of the blind gross improvement of the community is not possible. There is a clear need for a device which can overcome these obstacles for the blind (Matsuda et al., 2007; Moore & Murray, 2001).

Figure 1. Basic Braille Structure



All over the world all the countries have adapted the system 'Braille' as a universal approach to get the information for the visually impaired. A novel prototype is designed for both 'Text to Braille conversion' as well as 'audio signal to Braille conversion' for visually impaired people. The novelty of the design lies in the fact that it will also help to those blind persons who have hearing deficiency. These types of composite devices are not proposed so far as per the best of knowledge of authors, however, it should be acknowledged that individual devices are proposed a few though not practically realized in the commercial stage. All over the world all the countries have adapted the system 'Braille' as a universal approach to get the information for the visually impaired. Henceforth, prolong demand has been raised in all area across the world to help them for adapting with the real world situations, and therefore, electronic devices are proposed for the said purpose. The great problem faced by the blind are how to read digital

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