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OPTICAL BRAILLE TRANSLATOR - COMMUNICATION TOOL FOR VISUALLY IMPAIRED PEOPLE

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It is necessary to provide and support visually impaired people with special systems and technologies to allow communication and interaction with each other and with non-blind people. Hearing and touch feeling are the two main senses used by visually impaired people where these senses are more advanced and sensitive than in sighted people. The most famous paper communication system for blind people is the Braille system which depends on the sense of the touch of the finger. However, most people in the society cannot understand Braille. Therefore, paper communication between visually impaired people and people without vision problems has become a bottleneck that needs to be addressed. Translating Braille into Sinhala or any other languages will be important to visually impaired people to improve their communication capabilities. In this project a system was developed to translate imprinted Braille into selected language (Sinhala or English) text. This project was mainly based on the image processing and Optical Character Recognition (OCR) technology. Several types of mathematical algorithms were used in MATLAB environment to extract imprinted Braille characters from an input image. Input images were RGB images of Braille documents. The developed system first identifies the Braille character regions automatically. After which the identified character regions are reconstructed for better identification. Finally, reconstructed Braille letters are translated into corresponding font based on the selected language, either Sinhala or English. With this we introduce a novel method of identifying Braille letters based on binary numbers. This Optical Braille Translator (OBT) can identify most Sinhala Braille characters, grade 1 English Braille characters and few grade 2 English Braille characters. Furthermore, this OBT can identify numbers and English capital letters in a sentence. Finally, identified Braille characters translated into given language (Sinhala or English) and translated font file can be opened as a Microsoft Word document. A simple user interface was developed to access this Optical Braille Translator easily.

Keywords: Optical Braille, visually impaired people, character recognition, image processing, segmentation

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