



**INFORMATICS
INSTITUTE OF
TECHNOLOGY**

INFORMATICS INSTITUTE OF TECHNOLOGY

In Collaboration with

UNIVERSITY OF WESTMINSTER

**Braille to Sinhala Text Converter Application for Academic
Assistants and Relatives of Blind Students**

***Sin*Braille**

A dissertation by

Sandukith Gamage

W1790315 – 20191201

Supervised by

Ms. Sapna Kumarapathirage

Submitted in partial fulfilment of the requirements for the BEng
(Hons) Software Engineering degree at the University of
Westminster.

May 2023

ABSTRACT

Braille is frequently used by blind people as a writing and communication tool. Blind people find it challenging to share their written work with a wider audience due to the communication gap caused by non-blind people's lack of access to braille literacy. The goal of this research is to close this communication gap by creating a braille to text conversion system that will enable non-blind people to read braille. Blind people will be able to share their written work with a larger audience and create positive communication and understanding by bridging this gap.

By developing a machine learning model, the researcher hopes to narrow the communication gap between braille-using blind people and non-blind people. As an optical character recognition (OCR) system, this model will be able to decode Sinhala braille characters and translate them into normal Sinhala characters. Convolutional neural networks (CNN) will be the main method the researcher uses to achieve this. The goal is to give visually impaired people a clear and simple and practical tool to share their written work with a larger audience.

The successful implementation of a braille to Sinhala text converter with a high accuracy level can overcome the challenges posed by the complex linguistic structure of the Sinhala language. This will ensure that text written in braille can be translated into a readable form without any difficulties. The process of conversion requires not only character-by-character translation, but also normalization of the output to improve readability. The development of a braille to Sinhala text converter that accurately addresses these challenges has the potential to greatly enhance communication and accessibility for visually impaired individuals.

Key Words

Braille Character Recognition, Sinhala Word Auto Corrective Algorithm, Braille, Image Processing, Blind Community

Subject Descriptor

Computing methodologies ~ Machine learning ~ Machine learning approaches ~ Neural networks

Computing methodologies ~ Artificial intelligence ~ Computer vision ~ Computer vision problems ~ Image segmentation

Computing methodologies ~ Modeling and simulation ~ Model development and analysis ~ Modeling methodologies