

# **AUTOMATED BRAILLE – SINHALA RECOGNITION SYSTEM**

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### Abstract

Visual impairment, also distinguished as vision loss or vision impairment, is a reduced ability to understand or see normal daily life activities. This difficulty leads to the communication gap between visual impairment and others in society. Braille is a tactile reading and writing system practiced by people who are visually damaged. It is normally written with an embossed document. Most non-blind people do not understand to read or write braille characters. The braille character's nature makes it harder to understand and may lead the user to the incorrect direction.

In Sri Lanka, vision-impaired people use Sinhala braille for their studying. And knowing how to read and write Braille characters for Sinhala is very important. Because it leads to an equitable society. The purpose of the research was to provide a solution to the society on how to reduce the communication gap between visually impaired and non-blind people. To overcome the above-mentioned barriers more efficiently by reducing the number of human hours spent on reading and writing braille the author provides Automated Braille-Sinhala Recognition System.

In the proposed solution, The Convolutional Neural Network model is used to identifying characters in a Braille image or Sinhala image. The proposed solution is capable of identity Braille character in an image and translates them into the Sinhala language. Image pre-processing techniques, PyTorch, and Fastai libraries are utilized to accomplish the above process. Further, this system also capable of translating the Sinhala language into Braille by scanning an image using a Google Vision API. The translated text is presented in a word application as a result. And a performance testing process was taken place to analyze the accuracy and the performance of the system. The evaluated outcomes verified that the accuracy of the selected technologies, techniques and translation modules are at a satisfactory level. A critical evaluation process was conducted based on the various evaluation criteria, including different groups. The outcomes of the evaluation process declared the limitations and strengths of the design and some improvements were recommended.