Project Proposal

Bengali Braille to Text Translator

Course: SE801 Project

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LETTER OF TRANSMITTAL

4th August 2019

Regular Program Office

Institute of Information Technology

University of Dhaka

Subject: Submission of Project Proposal of Software Project Lab – III.

Dear Sir,

I am pleased to submit the proposal of SPL – III on project Bengali Braille to Test Translator. Inside, you'll find a brief description about the project that I want to complete in my SPL – III.

I am eager to hear your comments and answer any questions you may have.

Sincerely yours,

_____   _____

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1. Broad Domain

Braille is a reading and writing system which can only be read with the sense of touch. It is used by blind and visually impaired people who cannot access print materials. Braille is not a language. Rather, it is a code by which many languages can be written and read. It uses raised dots to represent the letters of the print alphabet. It also includes symbols to represent punctuation. A Braille character is made using a combination of 6 dots which is arranged in two columns and three rows. Figure 1.1 represents Bengali 'আ'.

Figure 1.1: Braille code of Bengali character আ'.

Figure 1.2 represent the Braille code of the Bengali Text "আমার সোনার বাংলা".
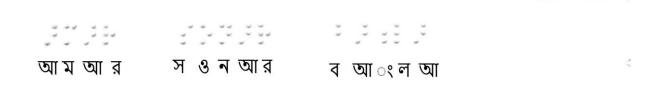

আ ম আ র   স ও ন আর   ব আ◌ং ল আ

Figure 1.2: Braille code of "আমার সোনার বাংলা".

This project aims to extract Bengali text from a scanned image of the paper on which Bengali Braille code is typed.

2. Problem Statement

Braille is a scheme that enables read and writes to blind and visually impaired people and has been around for almost 200 years. A collection of raised dots with some language-wise syntax is used by the language to characterize the alphabet. But there exist a few people who are neither blind nor visually impaired know Braille code and its syntax. It creates a written communication gap between people who are visually impaired and who are not. This project will help people to read the Bengali Braille Code easily. Scanned image of paper on which Bengali Braille code is typed will be the

input and corresponding Bengali text will be the output of this system. Blind people will benefit from this system as they will be able to reach readers who are not blind.

3. Existing Work

There exist many works on Text to Braille code translation for different languages. But a few works exist on Braille to Text Translation. So far there exists Braille to Text Translator for English [1], Arabic [2] and Gujarati [3] languages. For Bengali Braille there is a project that can identify only the characters where the braille code of characters are separated with long distance from each other. Besides it could not provide good accuracy for word identification.

4. Project Overview

The main focused of this project is to develop a system for converting Bengali Braille document into its equivalent natural language characters and words which is called Optical Braille Recognition (OBR). It involves two main steps like Recognition of Braille cell and transcription of the Braille cell. The first step involved a few pre-processing steps, dot and cell recognition, etc. Second step aimed at converting the segmented Braille character into its natural language character. The following methods will be applied to develop the system.

i. Preprocessing

  - ➢ Converting the image to Gray Level
  - ➢ Image enhancement
  - ➢ Image thresholding
  - ➢ Converting image to binary image

ii. Braille Characters Identification

  - ➢ Dot identification
  - ➢ Line identification
  - ➢ Braille cell identification
  - ➢ Character identification

iii. Post Processing

  - ➢ Word identification
  - ➢ Spell checking

➢ Bengali text generation

5. Timeline

The proposed timeline of this project is given below.

Weeks	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
Requirement Analysis	X	X	X									
Literature Review		X	X	X	X	X	X	X				
Implementation			X	X	X	X	X	X	X	X	X	
Result Analysis								X	X	X	X	X
Documentation			X	X				X	X	X	X	X

6. References

[1] M. Gadag, "Generation of English Text from Scanned Braille Document," *IJESC,* 2016.

[2] S. D. Al-Shamma, "Arabic Braille Recognition and Transcription into Text and Voice," *Cairo International Biomedical Engineering Conference,* 2010.

[3] H. Parekh, "Gujarati Braille Text Recognition: A Review," *IJCSC.*