GROUP No.: CS #8

PROJECT PROGRESS REVIEW REPORT

PROJECT TITLE: AI-Powered Braille Assistive Technology for the Visually Impaired

AREA OF WORK: Artificial Intelligence

TYPE OF MODEL: Software-Based Intelligent System (AI + Deep Learning + Web Application)

PROJECT AIM & OBJECTIVES

Aim: The aim of this project is to develop an AI-powered assistive technology system that enables visually impaired individuals to convert printed text into Braille, detect Braille dots from images, translate Braille into text, and generate audio output using OCR, YOLOv8, and Text-to-Speech technologies. The system aims to promote inclusive education, independence, and affordable accessibility solutions.

.Project Objectives

Objective#1: : Design and develop a print-to-Braille conversion system using Optical Character Recognition (OCR).

Objective#2: Develop a Braille dot detection module using YOLOv8 deep learning model.

Objective#3: : Implement Braille-to-text translation and Unicode mapping system.

Objective#4: Integrate multilingual Text-to-Speech (TTS) functionality (English & Hindi).

Objective#5: Develop a web-based user interface using Streamlit for easy interaction**.**

PROPOSED DESIGN METHODOLOGY:

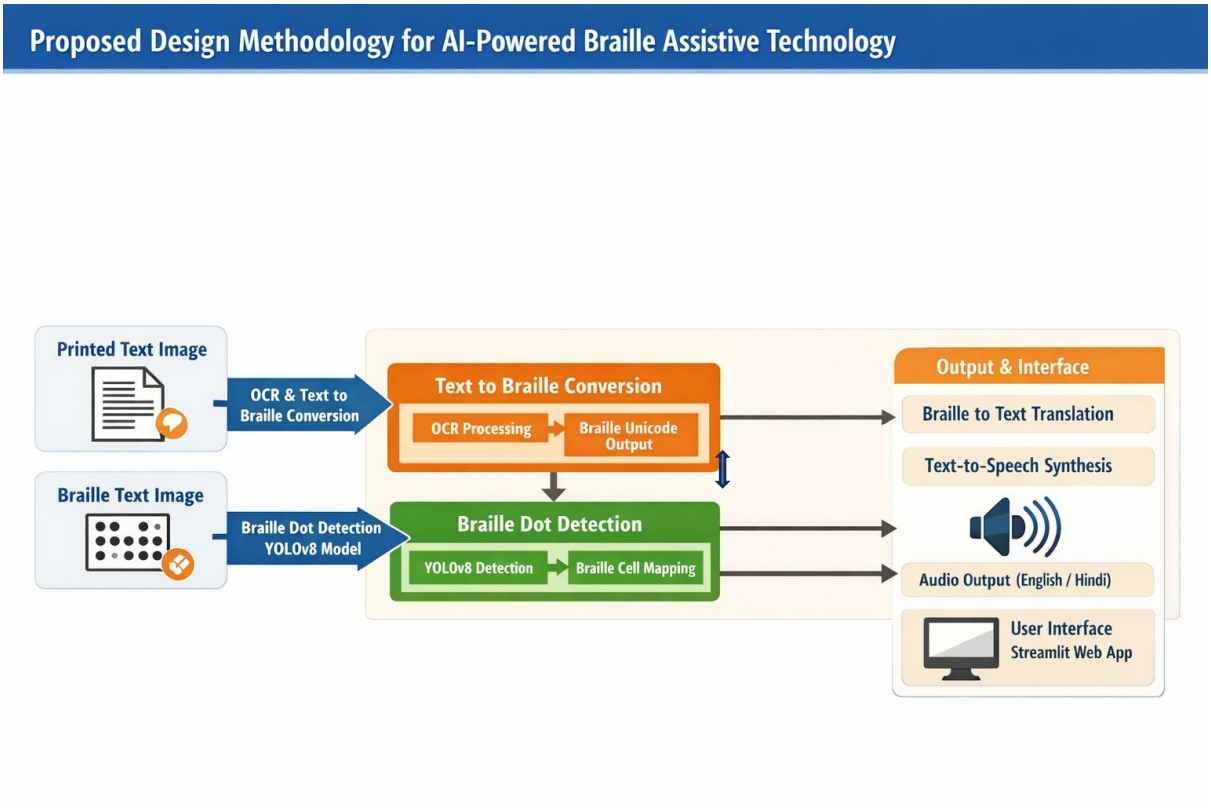

Fig. 1: Block Diagram of Proposed Design Methodology for AI-Powered Braille Assistive Technology for the Visually Impaired

PROGRESS IN WORK: During this period, the following work has been completed:

- OCR-based print-to-text module completed.
- Braille Unicode mapping implemented.
- YOLOv8 model training for Braille dot detection completed.
- Text-to-Speech integration completed.
- Web interface development using Streamlit completed.
- System testing and performance evaluation in progress.

SOURCE REFERENCE(S):

- **Datasets :** Braille Image Dataset – Roboflow
- OCR Dataset – Printed & Handwritten Samples

Research References:

- Smith, R. (2007). An Overview of the Tesseract OCR Engine.
- Redmon et al. (2016). You Only Look Once (YOLO).
- Ultralytics Documentation – YOLOv8.
- Unicode Braille Standard – unicode.org

PROGRESS REPORTED: 60 %

NAME & SIGNATURE OF TEAM MEMBERS:

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(APPROVED/NOT-APPROVED)

NAME & SIGNATURE OF PROJECT GUIDE (With Date)

Mr. Krishna Kumar Yadav(Asst. Professor)

EVALUATION REMARKS BY PROJECT COORDINATORS(S):