

INTRODUCTION

Through in-depth research, we develop a recognition device to capture Arabic braille scripts based on the fundamentals of machine learning/ deep learning techniques. Using Arabic braille system with no braille experience can be difficult at first. Therefore, our system will assist visually impaired individuals in learning how to read/ write in Arabic language. In addition, we aim to assist instructors and individuals who seek teaching and communicating with visually impaired individuals.







NOVELTY

- Improve the learning process of Arabic braille system for an individual who lost their sight due to some circumstances.
- To ease the means of communication between sighted individuals and visually impaired individuals.
- To assist instructors, who are not familiar with braille system, in teaching visually impaired individuals

METHODOLOGY

This project aims to help visually impaired individuals, especially those who lost their sight recently, to make the learning process more effective and efficient. In addition, assisting Arabic braille teachers in general to help them translate braille, convert it into written and audio texts and make correcting scanning exam papers.

WORKFLOW

-  Capturing Braille Image RGB
-  Image Preprocessing - OpenCv
-  Recognition through Deep Learning
-  Validation Accuracy, Precision
-  Output Recognized Images
-  Text to Speech - gTTS, pyTTSx

TOOLS

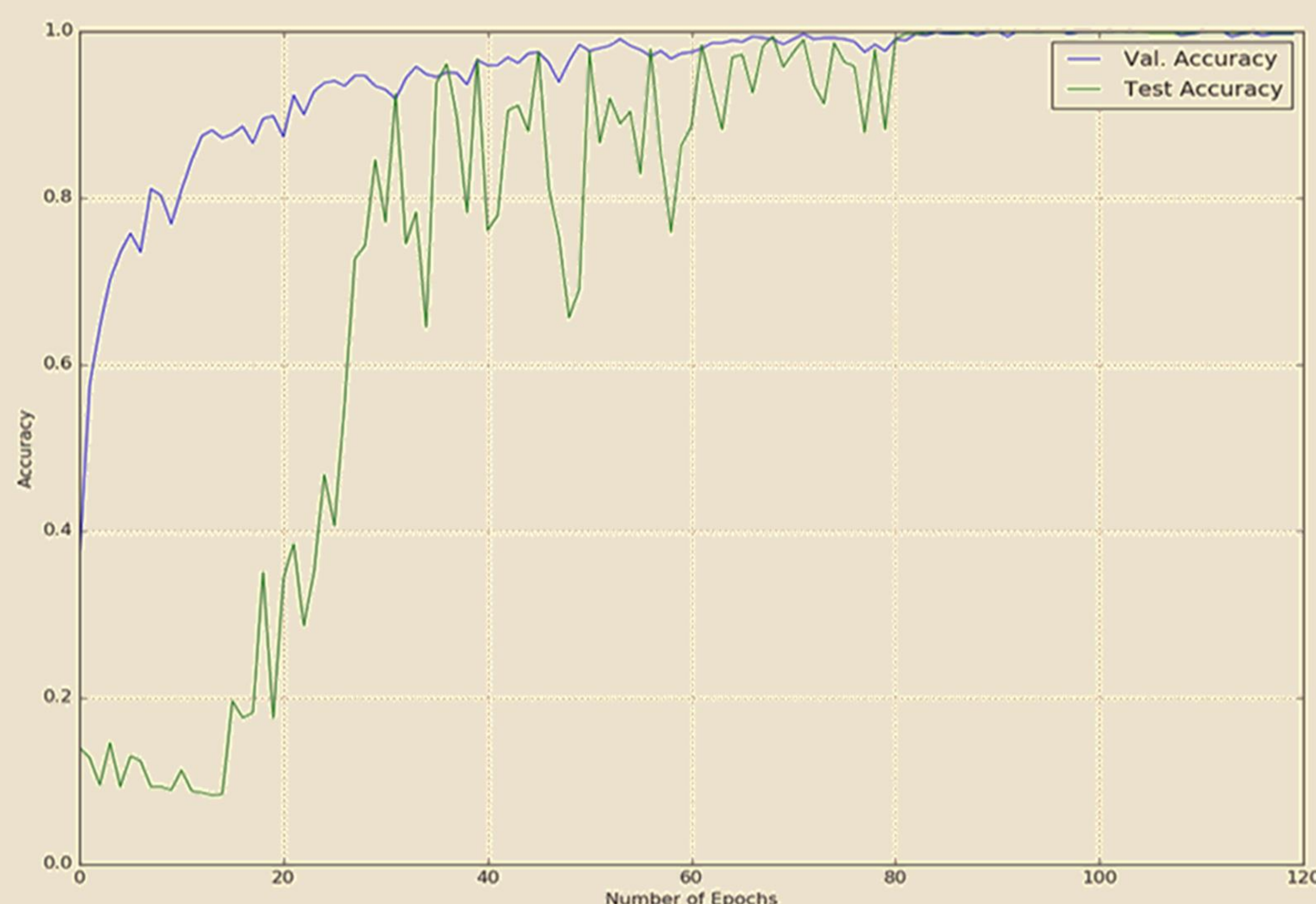


NEW BRAILLE DATASET

- Newly build dataset includes the 27 main letters, 4 sub letters, numbers from the 0-9, and 60 words.
- Generating 500 images for each letter, number, and word to form a dataset that consists of 50,500 images.



RESULTS



CHALLENGES

The challenge was to collect Arabic braille letters, numbers, and words to translate them to their correct meanings.

PROJECT POTENTIAL

The system will accept a captured image of Arabic braille script, process it using deep learning techniques, provide a correct translation of it and then convert it to speech audio representing the word that was processed.

Wafa Albur

201301480@pmu.edu.sa

Shorouq Alufaisan

201600234@pmu.edu.sa

Shaikha Alsedrah

201602719@pmu.edu.sa

DR. GHAZANFAR LATIF

glatif@pmu.edu.sa

METHODOLOGY

RESEARCH TEAM