# Voice of Hearing and Speech Impaired People

[1]Sadaf Manzoor, [2]Yasir khan

[1]NED University of Engineering and Technology, Karachi

[2]Department of Science and Technology & Information Technology

## Introduction

HandTok, a sign language translation application, leverages advanced AI techniques, including deep learning and computer vision, to empower speech and hearing impaired individuals to engage with the world, express their ideas freely and easily.


### Gestures into Written Text

The HandTok application translates sign language gestures into written text and spoken language.

### Voice into Gesture Language

The HandTok application also translates spoken language and written text back into sign language.

## Problem & Motivation

According to WHO statistics, currently more than **1 billion** people (**15%** of the global population) experience speech, hearing & other disabilities.

Communication gap between normal people and hearing & speech impaired people leads to **lack of opportunities, awareness & social isolation**. This project aims to bridge this gap by providing an interface between normal people and the impaired people.

## Contribution & Technologies Considered

### Contribution

**Mitigating communication barriers:** The application enables hearing & speech impaired people to overcome conversational problems and seize the opportunities.

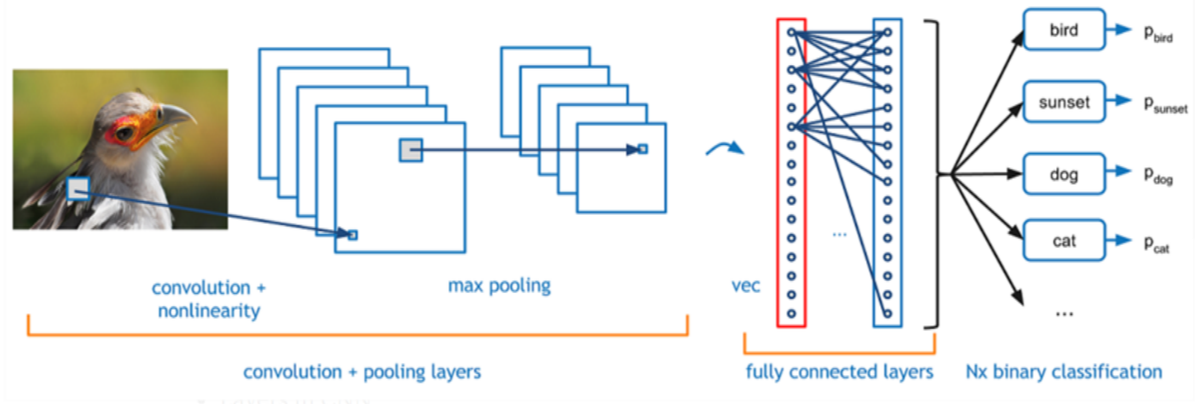
**Two way communication:** The HandTok application assists in two way communication for the impaired people.

### Technologies

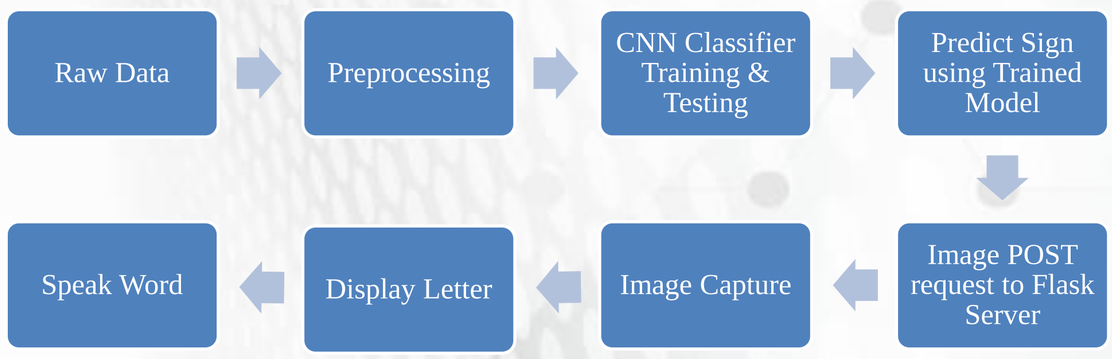
OpenCV, python, Flask, React Native, jupyter

## System Model & Architecture

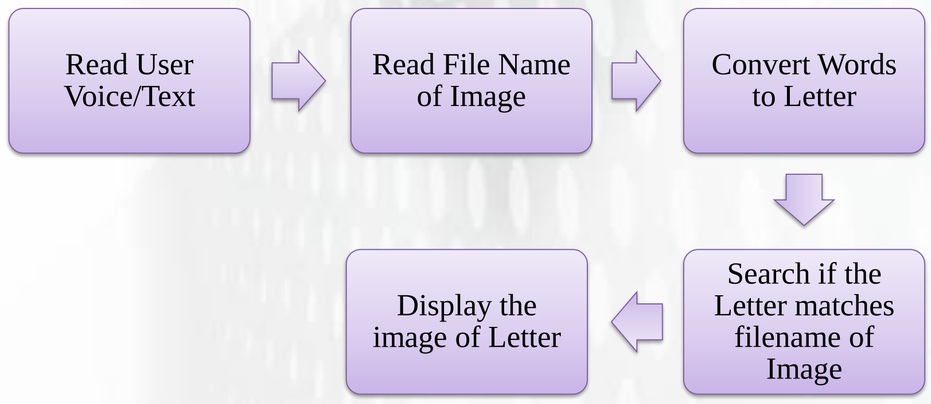
### CNN Model Training Demonstration




### Sign to Text/Speech




### Text/Speech to Sign




## Experimental Findings

| Training & Validation Loss | |
|---|---|
| Training Loss | Validation Loss |
| 95.0% | 95.0% |

| Training & Validation Accuracy | |
|---|---|
| Training Accuracy | Validation Accuracy |
| 98.2% | 98.0% |