



Bansilal Ramnath Agarwal Charitable Trust's

VISHWAKARMA INSTITUTE OF TECHNOLOGY

(An Autonomous Institute Affiliated to Savitribai Phule Pune University)

Accredited with 'A++' Grade by NAAC

DEPARTMENT OF COMPUTER ENGINEERING

TY. B. Tech, SEM VI A.Y. 2024-25

AI-CP Project

Group Id: TY-22

Team Members:

| Roll no | Name | PRN |
|---------|------------------|----------|
| 73 | Harshad Deshmukh | 12320014 |
| 74 | Piyush Ghadge | 12320015 |
| 75 | Vinay Hajare | 12320035 |
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CP Title: Shabdancha Shunya - A real time translator for deaf and mute

Objective: Design an efficient real-time Marathi Sign Language recognition system using deep learning (EfficientNetB0), custom datasets, and TensorFlow Lite, deployed on Raspberry Pi to assist communication for the deaf and mute community.

Importance: Enables real-time communication for Marathi-speaking deaf and mute individuals using deep learning, sign recognition, and affordable embedded systems.

Summary

The "Shabdancha Shunya" project is designed to help people who are deaf or mute communicate by recognizing hand gestures from Marathi Sign Language. We started by creating a custom dataset of **43 words**, with **1,000 images** for each word, totaling **43,000 images**. For training the system, we chose the EfficientNetB0 model, which worked well, achieving **96% accuracy** in recognizing the gestures. After training, we converted the model to a format called TensorFlow Lite so it could run on a **Raspberry Pi**, making the system small, affordable, and able to work in real time. The main goal of this project is to help people who can't hear or speak communicate more easily using a solution that supports Marathi Sign Language and works on low-power devices.

Target Audience: deaf and mute community

Expected Outcome: Product



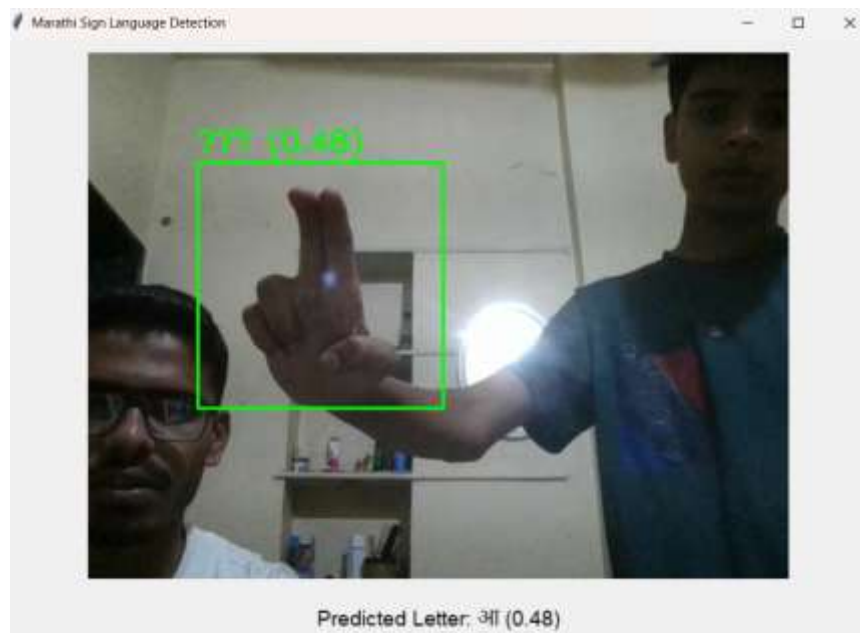
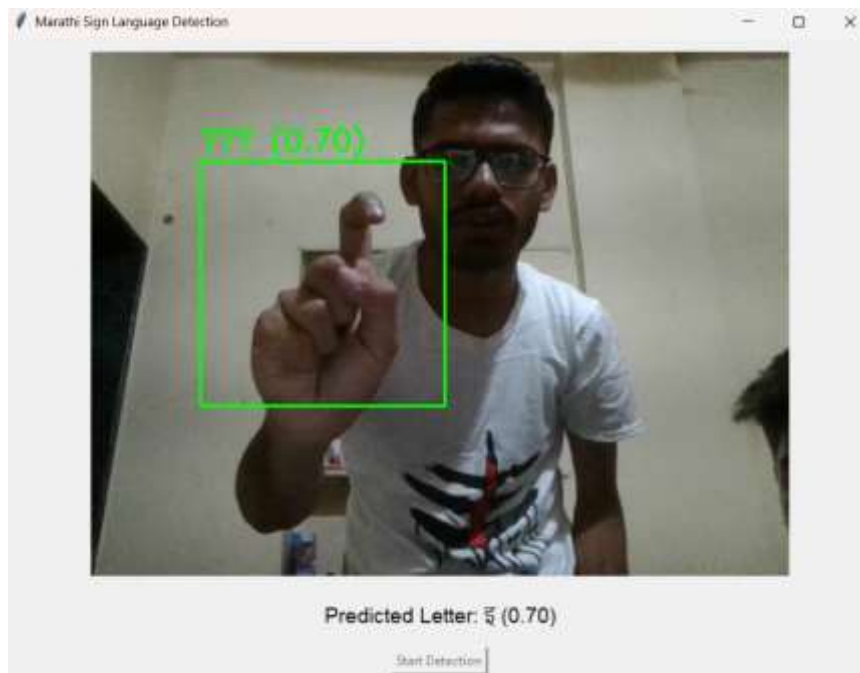
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Photos:



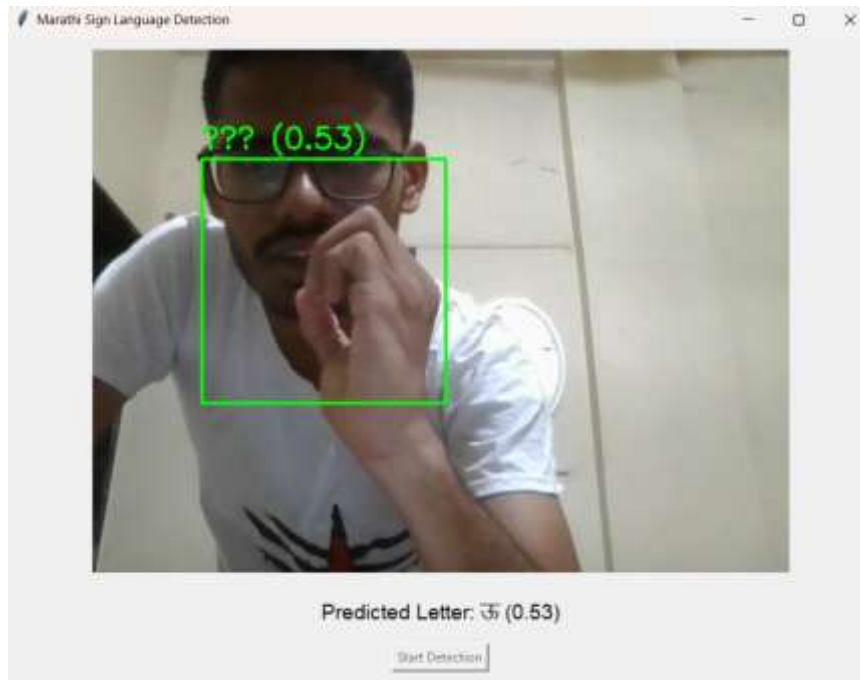


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These are the images we initially used to train the model on our PC. The images below show the output of our project after converting the model into the TFLite version and deploying it on the Raspberry Pi. These represent the final outcome of our project.



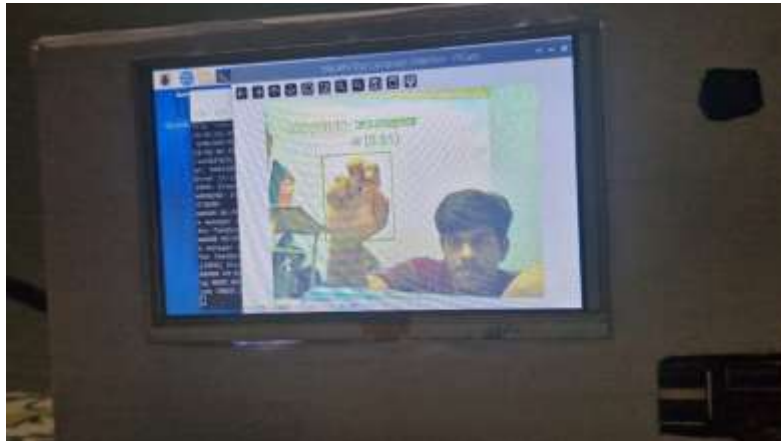


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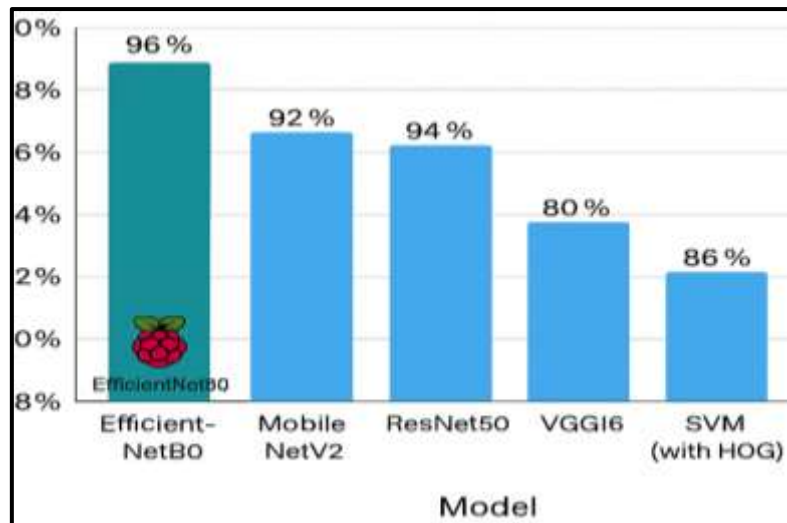


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Model-wise Accuracy Comparison for Sign Language Recognition



Course Teacher

Dr. Deepak T. Make