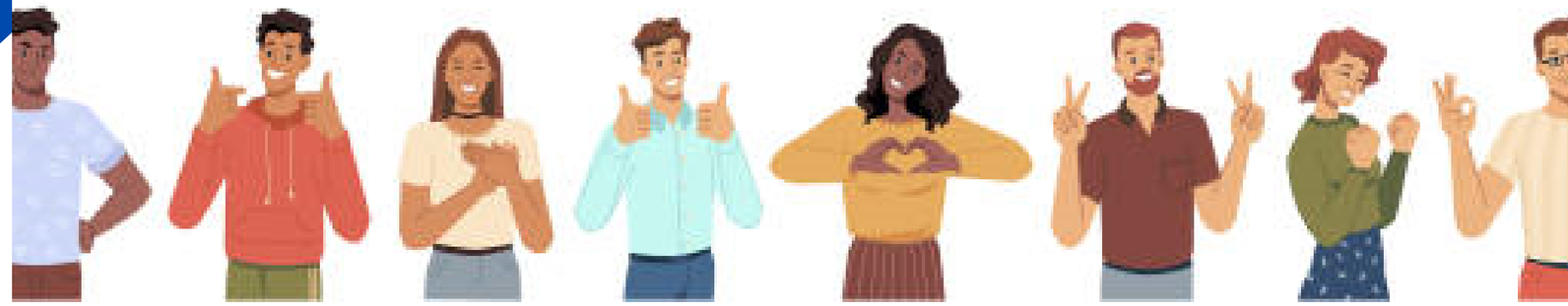
THE ODA CLAN

KSL FINGERSPELLING

RECOGNITION

Outline



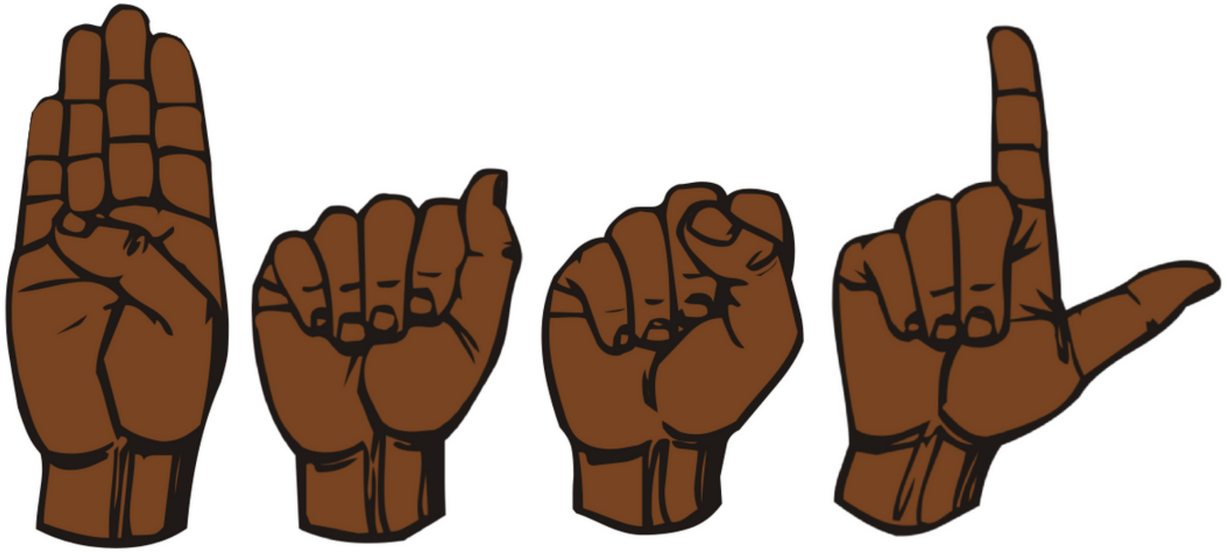
INTRODUCTION

Fingerspelling is vital for communication among the deaf and mute.

Bridging the gap between the deaf and the rest of the community is crucial for improving communication accessibility.

PROJECT OVERVIEW

Our mission is to bridge the gap through machine learning to empower the deaf and mute community.



PROBLEM STATEMENT

Our project develops a CNN model for precise fingerspelling recognition.

This promotes inclusivity and accessibility, fostering effective interactions with the deaf and hearing impaired.

OBJECTIVES

To develop a machine learning model that translates fingerspelling into text.

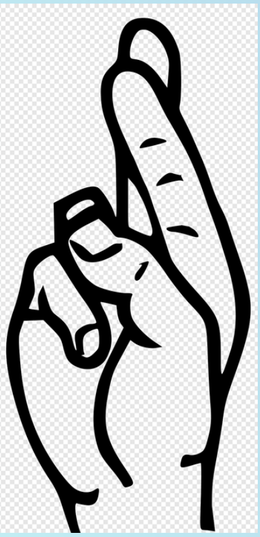
1. Train a specialized CNN model for fingerspelling recognition.
2. Evaluate the model's performance.
3. Deploying the model.

DATA UNDERSTANDING

- The dataset was from Kaggle and supplemented with over 3,000 images collected by the team.

- The dataset includes 24 letter classes, excluding 'J' and 'Z' due to motion requirements.

- kaggle Training and test set had 27,455 and 7,172 images



MODELING

Employed the following models:

- Densely connected model
- CNN (Convolutional Neural Networks)
- Google Teachable Machine

DEPLOYMENT

- Deployed model on Streamlit as a web app for real-time fingerspelling interpretation.

- Created a user-friendly interface for easy input and interpretation of fingerspellings.

CHALLENGES

- A small dataset and varying image quality had an impact on the accuracy.
- Limited hand gestures in the dataset restrict recognition of Kenyan Sign Language letters.
- The model's inability to recognize fingerspelling beyond Kenyan Sign Language limits versatility.

CONCLUSION

- Despite the challenges, the model achieved an accuracy of over 90% on the test dataset.

- The model improves communication for deaf and hard-of-hearing individuals by enabling easier communication with non-sign language users.

RECOMMENDATIONS

- Dataset Expansion: More images
- Image Quality Improvement: Higher-quality images can lead to better pattern recognition
- Integration with Speech Recognition and NLP to do sentence prediction.

NEXT STEPS

- Incorporate the use of IoT devices to enable our model to do real time translation

- Train our model in local languages i.e Kiswahili to make it more favorable for the majority of the population.

- Train our model on a large dataset to allow more variations for the letters and even motion

CONNECT WITH US!

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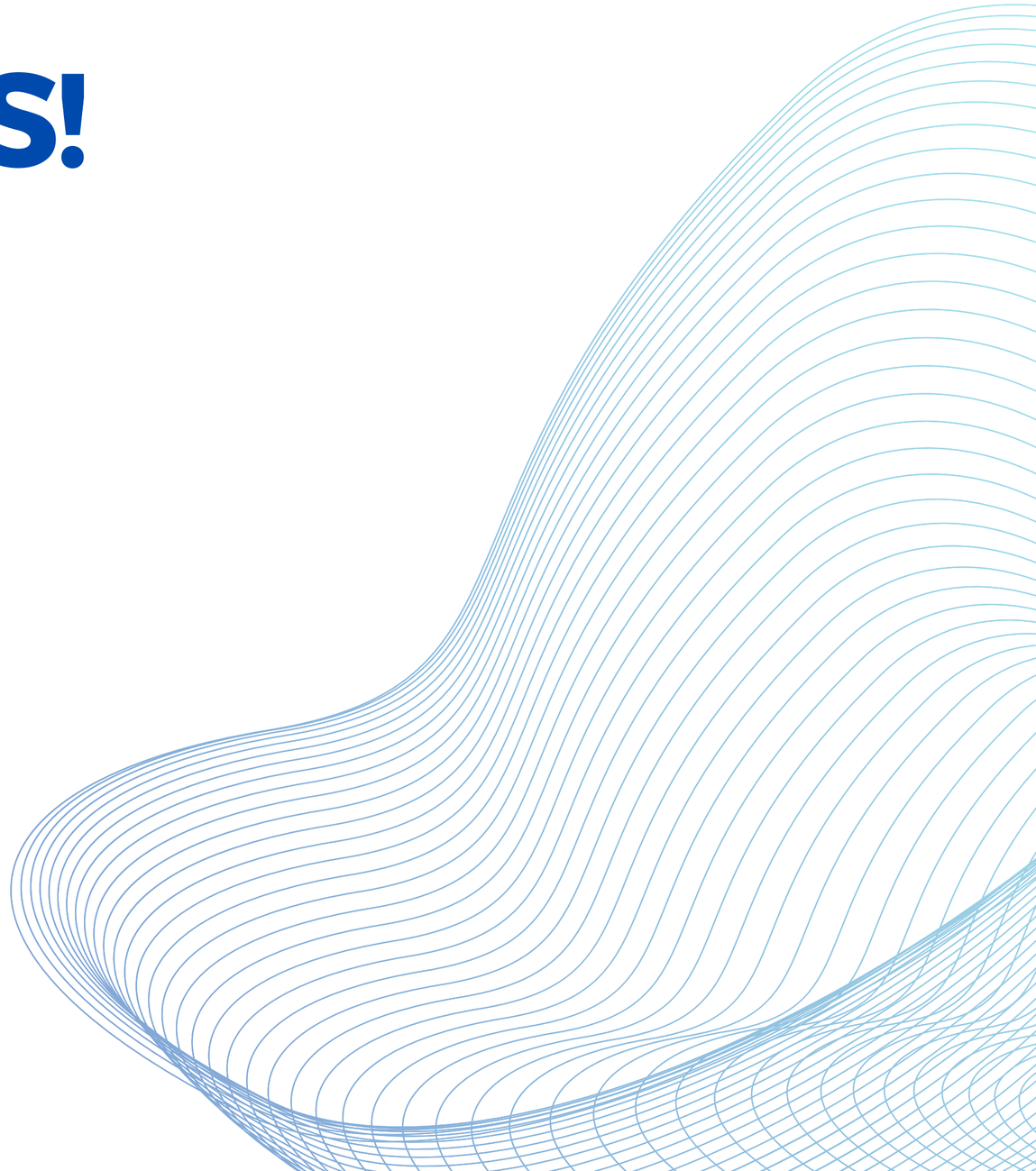

THANK YOU

Oda clan, your reliable one stop solution!