



**Silence is
Hearable**

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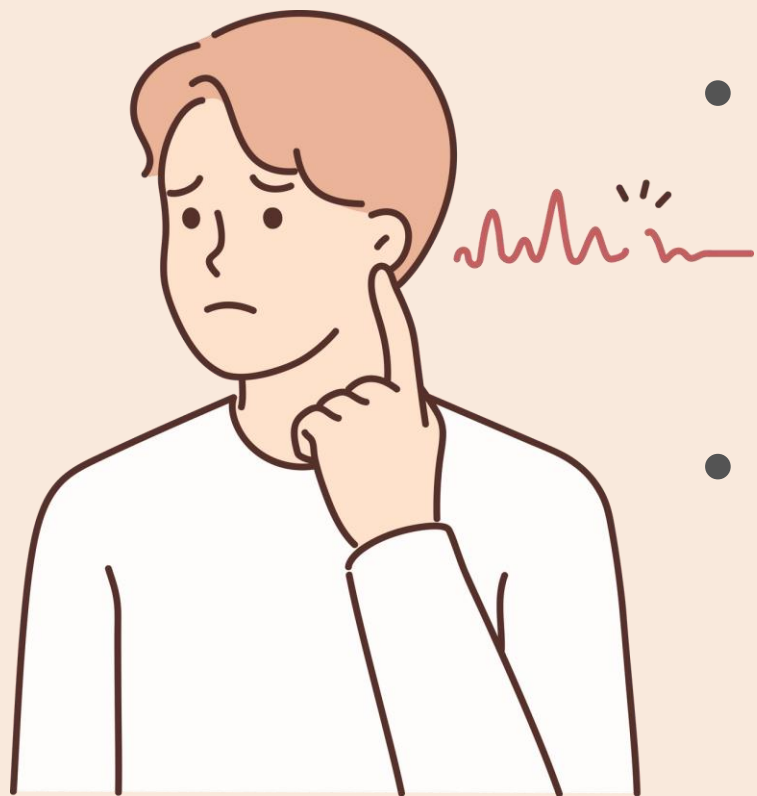
Introduction

- **What is Sign Language?**
- **Need of Sign Language System**
- **What's in the proposed system?**



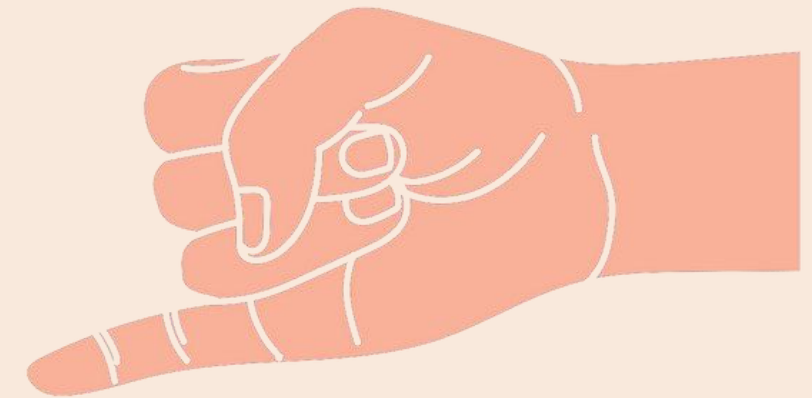
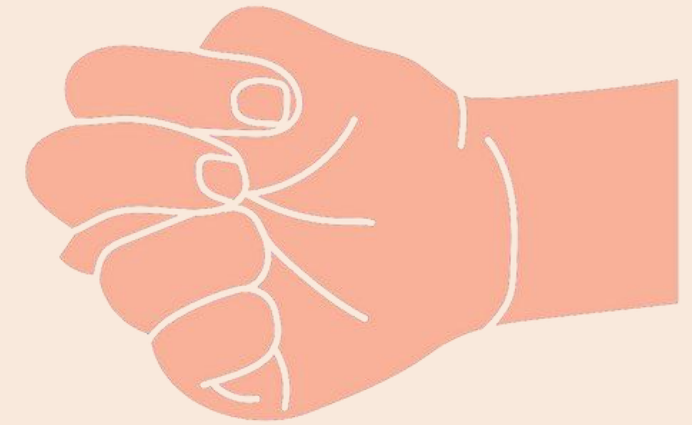
Project Goals

- Bridge communication gap for sign language users
- Integrate facial expression analysis for enhanced & better communication
- Real time sign language interpretation



Why we need this system?

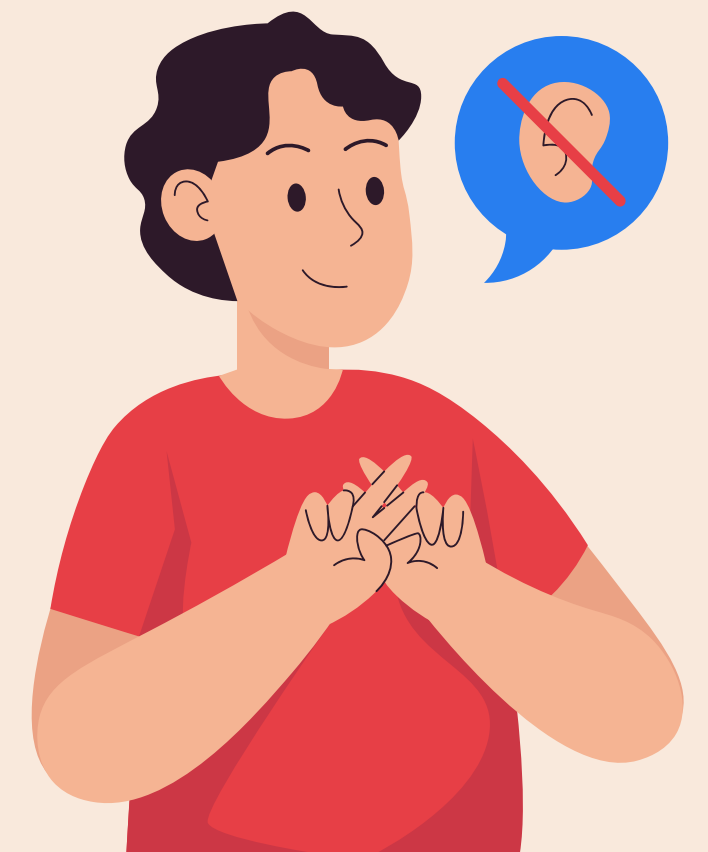
- **To replace human sign language interpreters**
- **Overcome privacy issue**
- **24/7 availability**
- **Well-being of the deaf and hard-of-hearing community**





Targeted Audience

- **Hearing-impaired individuals (Deaf & Hard-of-hearing community)**
- **Educational Institutions**
- **Healthcare providers**
- **Customer service**
- **Offices**
- **Sign language interpreters & learners**



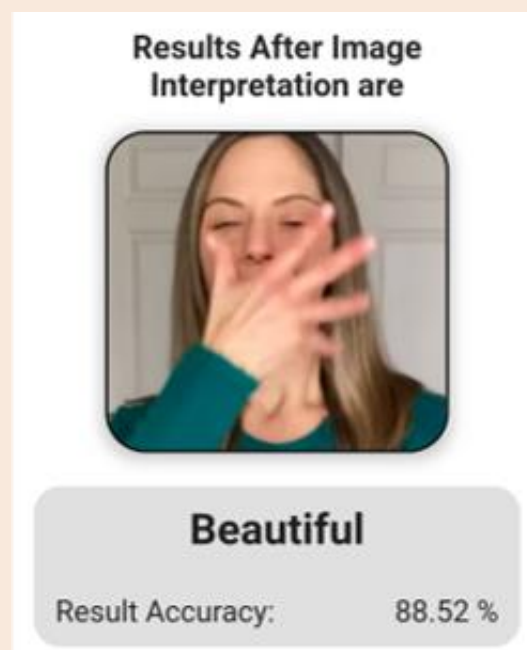
Existing System VS Proposed System

Existing System

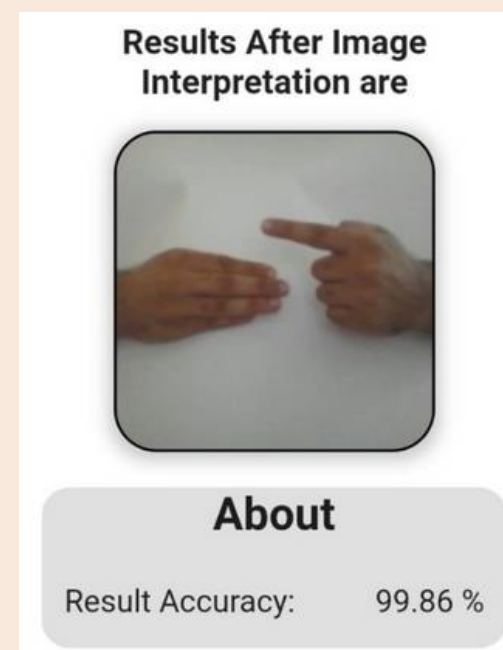
- Based on Real-time Sign language recognition only
- Generates textual output of one or two words
- Image-based interpretation

Proposed System

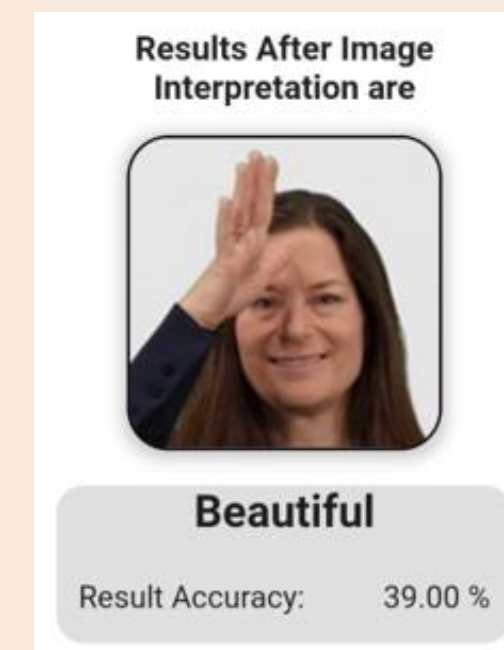
- Based on real time sign language detection with facial expression analysis
- Generates output in a complete sentence
- Face detection, translation, and NLP



Correct prediction

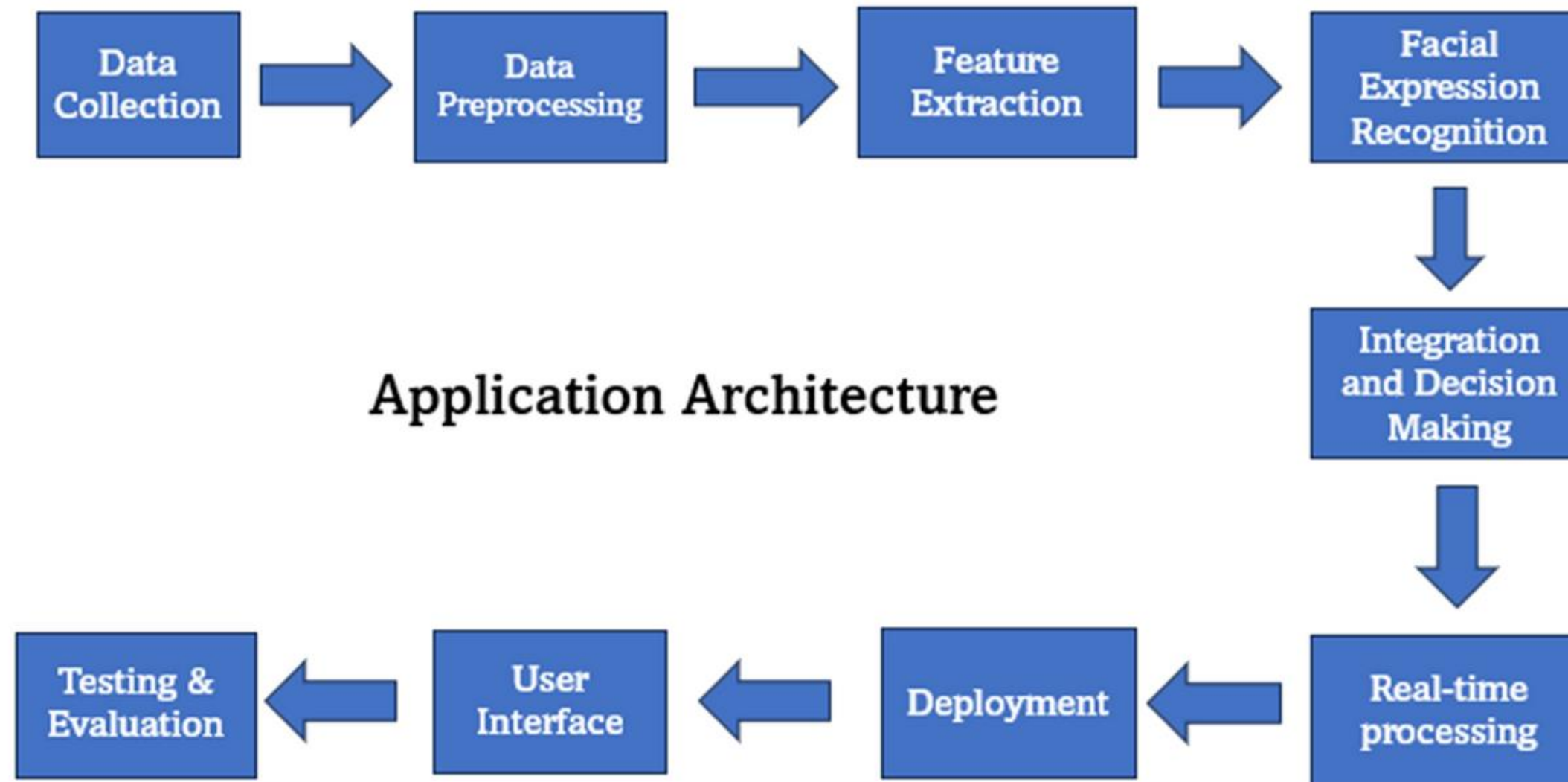


Correct prediction



Incorrect prediction

Architecture





Main Modules

- **Sign Language Detection Module:** Recognizes and interprets sign language gestures
- **Facial Expression Analysis Module:** Analyzes facial expression to provide contextual information
- **Integration:** Combines the outputs of both modules to enhance overall communication understanding
- **Translation:** Translates the sign language into sentence

Tools & Technologies

Programming Languages

- **Python**
- **Dart & Flutter**

Libraries & Framework

- **TensorFlow & TensorFlow Lite**
- **OpenCV (Open Source Computer Vision Library)**
- **Keras**

Integrated Development Environment (IDEs)

- **Google Collab's Notebook**
- **Android Studio**
- **Jupyter Notebook**

Algorithms

- **CNN (Convolutional Neural Network)**
- **RNN (Recurrent Neural Network)**