Data Science Project

Indian Sign Language Translation

Bridging the Communication Gap

Team members

1 D.Meeravali

Indian Sign Language (ISL) is a visual-gestural language used by the deaf community in India, employing hand movements, facial expressions, and body postures for communication.

The need for ISL translation system conversion arises from the communication barrier between deaf individuals and those unfamiliar with sign language, affecting access to information in education, healthcare, and daily interactions.

Our solution addresses the communication gap between spoken language and Indian Sign Language (ISL) by employing deep learning and data science techniques.

Normal language to Sign Language Conversion:

The system captures images containing English text and uses Optical Character Recognition (OCR) to extract the written content. This text is processed using Natural Language Processing (NLP) and passed to a deep learning model pre-trained on Indian Sign Language (ISL) gestures. The model translates the text into ISL, which is then visually represented through gestures, enabling real-time communication for the deaf and hard-of-hearing community.

The system analyzes the text and predicts the corresponding sequence of ISL gestures. These predicted gestures are then visually displayed as sign language images

Tech Stack

We use a variety of tools, technologies, programming languages, frameworks, and libraries to develop and run software applications or projects.

01

PIL (Python Imaging Library)

We use Pandas for data manipulation and analysis, Numpy for numerical computations, PIL (Python Imaging Library) for handling image files, and Scikit-learn for preprocessing (Label Encoding) and splitting data into training and testing sets.

02

Natural Language Processing (NLP)

spaCy, NLTK, or Hugging Face Transformers are tools for language understanding and parsing, while models like BERT and GPT provide deep contextual comprehension of spoken language.

03

Deep Learning Framework:

TensorFlow / Keras For building and training deep learning models, including Sequential models, Convolutional Neural Networks (CNN), and utility functions like model visualization.

04

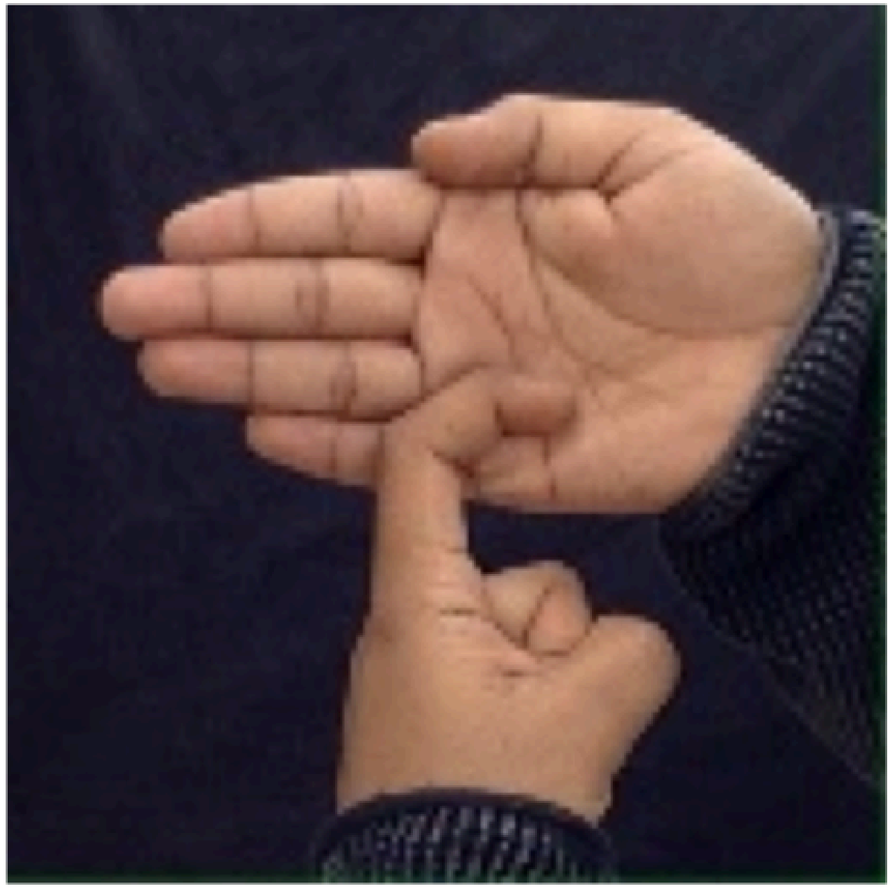
Convolutional Neural Networks (CNNs)

Convolutional Neural Networks (CNNs) are deep learning models specifically designed for processing and analyzing visual data. They use layers like Conv2D for feature extraction, MaxPool2D for dimensionality reduction, and Flatten and Dense layers for classification tasks.

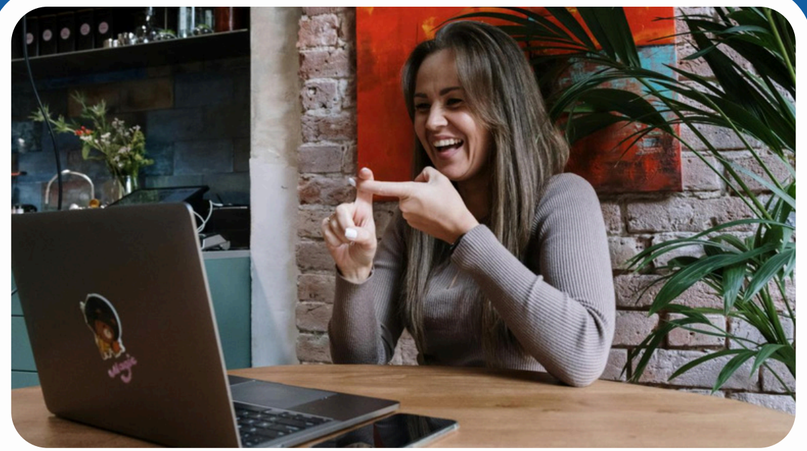
My prediction after testing:

```
1/1 [==============================] - 0s 119ms/step
```

Predicted: R



Applications



Improved Access to Information

These application enhances access to news, education, and other essential information.

Enhanced Social Inclusion

These application promotes social interaction and reduces isolation, fostering a sense of belonging.

Understanding Announcements

Converts announcements at railway stations, airports, or bus terminals into ISL gestures, ensuring deaf individuals can understand real-time updates.

Thank you!